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Welcome Message from the Organizing Committee

Welcome to the 46th Annual International Conference of the IEEE Engineering Medicine and Biology Society (EMBS) being held at Disney’s Coronado Springs Convention Center in Orlando, Florida, from July 15th - 19th, 2024.

IEEE EMBS is the world’s largest international society for biomedical engineers. The annual conference of the society offers its global members, from academia, industry, to health-systems and government, the opportunity to not only gather, network and share knowledge amongst each other, but also to publish and communicate world-wide the latest scientific discoveries and innovative biomedical engineering solutions.

As social determinants for health take on an ever-important role, the EMBC2024 theme, “Technology and its Promise for Equity and Access for Well-Health” highlights the impact that engineers can have on society. The broad array of themes covers diverse topics of cutting-edge research and innovation in biomedical engineering, healthcare technology, especially for women and children’s well-health, translational clinical research, technology transfer and entrepreneurship, as well as biomedical engineering education.

Three distinguished plenary speakers will present how engineering in medicine and biology is impacting society today and transforming the future.

- **Susan Margulies, Ph.D.** leads the US National Science Foundation (NSF) Directorate for Engineering. She will present how driving discovery, inspiring innovation, enriching education, and accelerating access in bioengineering is transforming our world for a better tomorrow.

- **Adriana Velazquez Berumen, MSc** leads the Medical Devices Unit at the World Health Organization (WHO). She will present the role that biomedical engineers and engineering solutions play in assuring access to safe, affordable, quality and appropriate health technologies and medical devices for all populations in need.

- **Rory A. Cooper, Ph.D.** is the Founding Director of The Human Engineering Research Laboratories, a joint center of the University of Pittsburgh and the US Department of Veterans Affairs, and a US National Medal of Technology and Innovation awardee. He will present how participatory action is necessary for designing and engineering technologies with people with disabilities.

The plenary session “BCI: State Of the Art, Art Of the Future” shall feature presentations and discussion by six companies leading the Brain-Computer Interfaces (BCI) revolution. Some of these technologies have advanced to human trials. Patient participants from these trials will be key members of the plenary session.

With nearly 2,700 submissions from the international scientific and research community, 1940 of which were regular contributed manuscripts, the global enthusiasm to contribute to the conference was excellent. The accepted submissions are organized into 119 regular paper oral sessions, 33 oral special sessions or mini symposia, as well as 31 poster sessions. These will be presented from July 16th-19th under one of the twelve thematic areas listed below. In addition, there are 11 workshops and tutorials on July 15th.

**EMBC2024 Thematic Areas**

- Theme 1: Biomedical Signal Processing
- Theme 2: Biomedical Imaging and Image Processing
• Theme 3: Bionanotechnology and BioMEMS
• Theme 4: Computational and Synthetic Biology
• Theme 5: Cardiopulmonary Systems and Physiology-based Engineering
• Theme 6: Neural and Rehabilitation Engineering
• Theme 7: Wearable Biomedical Sensors and Systems
• Theme 8: Biorobotics and Biomechanics
• Theme 9: Therapeutic & Diagnostic Systems and Technologies
• Theme 10: Biomedical and Health Informatics
• Theme 11: Biomedical Engineering Education and Society
• Theme 12: Technology for Women and Children’s Health/Equity and Access for Well-Health

Associated with each of the thematic areas, a theme keynote offered by a leading expert will highlight progress and opportunities in the focus area. This year, special emphasis has been placed to ensure that the keynotes are consecutively scheduled. This will allow our attendees to enjoy listening to every keynote of their interest. The speakers and their areas of expertise are listed below.

- **Theme 1:** Meltem Izzetoglu, Ph.D., Associate Professor, Villanova University. Specializing in Portable and Wearable Bio-optical Devices and Applications.
- **Theme 2:** Purang Abolmaesumi, Ph.D., Professor, University of British Columbia. Specializing in Medical Imaging and Machine Learning
- **Theme 3:** Luke P. Lee, Ph.D., Professor, Harvard Medical School. Specializing in Systems Nanobiology and Nanomedicine.
- **Theme 4:** Yu (Brandon) Xia, Ph.D., Professor, McGill University. Specializing in Computational Biology and Biomolecular Networks.
- **Theme 5:** Michael Khoo, Ph.D., Dean’s Professor, University of Southern California. Specializing in Computational Models of Autonomic, Metabolic, and Sleep Regulation in Chronic Diseases.
- **Theme 6:** Yiwen Wang, Ph.D., Associate Professor, Hong Kong University of Science and Technology. Specializing in Neural Decoding and Brain-Machine Interfaces.
- **Theme 7:** David E. Albert, MD, Chief Medical Officer, AliveCor. Specializing in Cardiac Diagnostic Technologies.
- **Theme 8:** Max C. Ortiz Catalán, Ph.D., Head of Neural Prosthetic Research at Bionics Institute. Specializing in Bionic Limbs and Neurorehabilitation.
- **Theme 9:** Delphine Dean, Ph.D., Professor and Chair, Clemson University. Specializing in Accessible Healthcare Solutions and Medical Devices.
- **Theme 10:** Anthony Chang, MD, Chief Intelligence and Innovation Officer, Children’s Hospital of Orange County. Specializing in AI in Medicine and Biomedical Informatics.
- **Theme 11:** Laura Waller, Ph.D., Professor, University of California, Berkeley. Specializing in Computational Microscopy and Optical Engineering.
- **Theme 12:** Michelle L. Oyen, Ph.D., Associate Professor and Inaugural Director of Center for Women’s Health Engineering, Washington University in St. Louis. Specializing in Experimental and Computational Biomechanics Techniques to Study Human Pregnancy and Preterm Birth.

To further enhance the conference experience, rooms have been strategically assigned so that each thematic area has a dedicated space throughout the conference. This consistency is expected to not only facilitate ease of navigation, but also foster a cohesive environment for ongoing discussions and networking. Additionally, for sessions running concurrently under the same theme, proximity has been ensured, to minimize travel time between rooms and maximize engagement with the content.
EMBC2024 hosts multiple awards, networking events, and career advancement opportunities for our young professionals and student attendees.

- For the first time, EMBS awards 262 EMBS Next Gen Scholarships to recognize active IEEE undergraduate or graduate student members who are the first authors of accepted papers.
- EMBS is sponsoring registration for student volunteers from the EMBS chapters in the US Southeast Region to promote regional student chapters as well as from 30 countries in the world.
- For the first time three Student Paper Competitions, chaired by Péter Kovács, Ph.D. and Nicolai Spicher, Ph.D. will be held on July 16th and awards given to three winners.
- A Students and Young Professionals: Networking Lunch will be held on July 16th-17th.
- A Student and Young Professional Reception will take place on July 16th.
- For the first time, an IEEE-compliant Young Professional Resume Database will be launched at EMBC2024. This database offers opportunities for attendees to share information for training and career opportunities. A booth will be available to enable EMBS members to search and apply for opportunities, upload resumes using keywords, sign up for alerts, and participate in future virtual and in-person career fairs.
- EMBS Leaders will be available to meet with young professionals at the EMBS booth.
- A Women in Biomedical Engineering (WiBME) Panel (sponsored by EMBS) and Women in Biomedical Engineering Lunch will be held on July 18th. The WiBME Panel will feature women leaders from government, industry and academic sectors.
  - Christine Edwards, Ph.D. Electrical and Biomedical Engineer, US Department of Defense; specializes in AI and Neuroscience.
  - Meike Herget, Ph.D. Chief Technology Officer and Co-founder of Avails Medical Inc.; engaged in developing electronic biosensors.
  - Jennifer L. West, Ph.D. Dean of Engineering and Applied Science, University of Virginia; specializes in Nanoparticle Therapeutics.
  - Vanessa E. Wyche, MS. Director, NASA’s Johnson Space Center and oversees the Artemis Missions.

In addition, EMBC2024 hosts several events for all attendees.
- Photo station at the EMBS booth, where all attendees will be able to take a professional photo.
- 3D holograph station at the EMBS booth for all attendees who want to experience a physical and virtual world interaction.

During the Opening Ceremony on July 16, the EMBS 2024 Society Awards will be presented to:
- Academic Career Achievement Award: Metin Akay, Ph.D.
- Professional Career Achievement Award: Michael Hess
- Early Career Achievement Award: Rose Faghih, Ph.D.
- Distinguished Service Award: Paolo Bonato, Ph.D.
- Technical Achievement Award: Ding gang Shen, Ph.D.
- Technical Achievement Award: Dimitri Van De Ville, Ph.D.
- The IEEE EMBS Award for Excellence in Biomedical Technology: John Rodgers, PhD.
- IEEE Medal for Innovations in Healthcare Technology

Finally, on July 17th, EMBS will host an Appreciation and Collaboration Ice Cream Social for members who stepped up as leaders to serve our community at large throughout the year as Technical Committee Chairs, Editors in Chief, and General Co-Chair or Technical Program Co-Chairs for all EMBS Financially-Sponsored Conferences.
There are well over 2,000 attendees from more than 55 countries around the whole world registered to attend EMBC2024 in person, with more than 1,100 are students and young professionals. Also, for the first time, EMBC has attracted 21 sponsors from industry, academia, and publishers. A special shout-out to IEEE Metaverse for helping EMBS bring cutting-edge technology such as the Hologram Booth to the Exhibit Hall. We are looking forward to a vibrant conference that promises to educate and engage all of us.

This conference could not have occurred without the concerted effort of the organizing committee, the student organizing committee, the editors, associate editors and countless paper reviewers, the IEEE staff, our Conference Catalyst partners, e-papers submission portal manager, and local volunteers. Our sincere thanks to all,

Welcome to EMBC2024! Welcome to Orlando!

Ranu Jung
Ph.D.
Conference Chair
University of Arkansas
USA

Bruce Wheeler
Ph.D.
Conference Chair
University of California San Diego
USA

Kevin Otto
Ph.D.
Program Chair
University of Florida
USA

María Fernanda Cabrera-Umpiérrez,
Ph.D.
Program Chair
Universidad Politecnica de Madrid
Spain

Georgios Mitsis
Ph.D.
CEB Editor-in-Chief
McGill University
Canada

May Wang
Ph.D.
VP Conference, 2024
Georgia Institute of Technology
USA

Rosa Chan
Ph.D.
VP Finance, 2025
City University of Hong Kong
Hong Kong
Welcome Message from the Editorial Board

Following the great success of EMBC 2023 in beautiful Sydney and Australia, the conference returns to the United States and its sunshine state – Florida! As always, it has been a very rewarding experience to interact with all the members of the Conference Editorial Board. The Board perfectly worked as a team with a great sense of commitment, and it was able to finalize the EMBC 2024 Conference Program on time.

I am pleased to report that we received 2673 submissions overall. 1940 of these were full contributed manuscripts which underwent our rigorous peer-review process, marking a significant increase compared to the two most recent in-person conferences after the COVID pandemic (Glasgow and Sydney). These were reviewed by a minimum of two reviewers per paper. The Theme Editors made initial Accept/Reject decisions and created a draft scientific program for each Theme. 88 of these papers participated in the student Award Paper Competition, further reviewed by an ad-hoc Committee, who selected a total of 15 finalists (5 geographic and 10 open).

Finally, there were 596 Research Poster submissions this year, of which 496 were included in the final program. These were reviewed by a special team of Associate Editors selected by the Program Committee and the EMB Technical Committees. I thank all these individuals for the rapid review of these submissions.

As always, we have strived to maintain a high quality for all the papers accepted to the final program by providing ratings and feedback to the authors. The continued dedication and commitment of the Editors, Associate Editors and Reviewers, makes this Annual Conference an active and vibrant scientific community with a very strong sense of collegiality. Therefore, I would like to take this opportunity to acknowledge all the members of the Editorial Board listed below and warmly thank them for their service. It has been an honor and a privilege to be part of this community of esteemed and committed scientists. Speaking on behalf of everyone, I believe that we are very excited to see the final program materialize and interact with each other at the conference. See you in Orlando!

Georgios Mitsis, Editor in Chief - Conference Editorial Board
Theme Editors

Theme 01. Biomedical Signal Processing
   Lei Ding
   Luca Mainardi

Theme 2. Biomedical Imaging and Image Processing
   Jim Ji
   Lejla Alic
   Alan Wang

Theme 3. Bionanotechnology and BioMEMS
   Esmaiel Jabbari
   Ozan Karaman

Theme 4. Computational and Synthetic Biology
   Yang Dai
   Georgios Mitsis

Theme 5. Cardiopulmonary Systems and Physiology-based Engineering
   Thomas Heldt
   Rebecca Mieloszyk

Theme 6. Neural and Rehabilitation Engineering
   David Guiraud
   Shanbao Tong

Theme 7. Wearable Biomedical Sensors and Systems
   Sunghoon Ivan Lee
   Bobak J. Mortazavi

Theme 8. Biorobotics and Biomechanics
   Arturo Forner-Cordero
   Yasin Dhaher

Theme 9. Therapeutic & Diagnostic Systems and Technologies
   Dorin Panescu
   Dieter Haemmerich

Theme 10. Biomedical & Health Informatics
   Ioanna Chouvarda
   Tatjana Loncar-Turukalo
   Omer Inan

Theme 11. Biomedical Engineering Education and Society
   Lauren Kark
   Hans van Oostrom
Theme 12. Technology for Women & Children’s Health/Equity and Access for Well-health
   Cecilia Vera Muñoz
   Arianna Dagliati

Minisymposia, Workshops & Special Sessions; One-Page Papers.
   María Fernanda Cabrera-Umpiérrez
   Kevin Otto

Student Award Paper Competition Editor
   Jiaen Liu
## Associate Editors

### Theme 01. Biomedical Signal Processing
- Ahmed, Beena
- Bari, Vlasta
- Bianchi, Anna Maria
- Boudaoud, Sofiane
- Cairo, Beatrice
- Humeau-Heurtier, Anne
- Kahya, Yasemin P.
- Kostoglou, Kyriaki
- Michmizos, Konstantinos
- Mijatović, Gorana
- Pachori, Ram Bilas
- Porta, Alberto
- Rivolta, Massimo Walter
- Sakkalis, Vangelis
- Signorini, Maria G.
- Song, Dong
- Subramaniam, Sandya
- Telfer Brian
- Valenza, Gaetano
- Vanrumste, Bart
- Voss, Andreas
- Yamamoto, Yoshiharu
- Yana, Kazuo
- Yang, Yuan
- Yuan, Han

### Theme 02. Biomedical Imaging and Image Processing
- Alic, Lejla
- Anastasio, Mark
- Brattain, Laura
- Chan, Kevin C.
- Fenster, Aaron
- Gonzalez Ballester, Miguel
- Angel
- Ji, Jim Xiuxuan
- Kassinopoulos, Michalis
- Lavarello, Roberto
- Liao, Hongen
- Qi, Duan
- Qi, Jingyi
- Prokopiou, Prokopis
- Sclocco, Roberta
- Suzuki, Kenji
- Vinegoni, Claudio
- Wang, Alan
- Xie, Guoxi
- Yan, Pingkun
- Al-Jumaily, Adel
- Astolfi, Laura
- Azevedo-Coste, Christine
- Babiloni, Fabio
- Bianchi, Anna Maria
- Chiappalone, Michela
- Giuraud, David
- Li, Nan
- Ludvig, Daniel
- Micer, Silvestro
- Muceli, Silvia
- Nonclercq, Antoine
- Petroff, Neil
- Santacruz, Samantha R.
- Stieglitz, Thomas
- Strauss, Daniel J.
- Tong, Shanbao
- Wang, Yiwen
- Weiland, James
- Zouridakis, George

### Theme 03. Bionanotechnology and BioMEMS
- Almasri, Mahmoud
- Hamad, Eyad
- Jabbri, Esmaiel
- Lei, Kin Fong
- Lord, Megan
- Raje, Manasi
- Siu, Vince
- Angulas, Antonis
- Dimitriou, Nikolaos
- Nickerson, David Phillip
- Peng, Zhangli
- Rampadarath, Anand
- Wei, Tian
- Xia, Yu

### Theme 04. Computational and Synthetic Biology
- Dai, Yang
- Dash, Ranjan
- Dimitriou, Nikolaos
- Nickerson, David Phillip
- Peng, Zhangli
- Rampadarath, Anand
- Wei, Tian
- Xia, Yu

### Theme 05. Cardiopulmonary Systems and Physiology-based Engineering
- Armoundas, Antonis
- Chalacheva, Patjanaiporn Sang
- Charleston-Villalobos, Sonia
- Heldt, Thomas
- Jané, Raimon
- Li, John K-J.
- Mieloszyk, Rebbecca

### Theme 06. Neural and Rehabilitation Engineering
- Abbas, James
- Al-Jumaily, Adel
- Astolfi, Laura
- Azevedo-Coste, Christine
- Babiloni, Fabio
- Bianchi, Anna Maria
- Chiappalone, Michela
- Giuraud, David
- Li, Nan
- Ludvig, Daniel
- Micer, Silvestro
- Muceli, Silvia
- Nonclercq, Antoine
- Petroff, Neil
- Santacruz, Samantha R.
- Stieglitz, Thomas
- Strauss, Daniel J.
- Tong, Shanbao
- Wang, Yiwen
- Weiland, James
- Zouridakis, George

### Theme 07. Biomedical Sensors and Wearable Systems
- Almasri, Mahmoud
- Amft, Oliver
- Bonato, Paolo
- Brattain, Laura
- Fang, Hua
- Gil Rosa, Bruno
- Godfrey, Alan
- Guo, Yao
- Jia, Wenyan
- Jin, Yincheng
- John, Arlene
- Jovanov, Emil
- Jung, Hee-Tae
- Kanzler, Christoph
- Kapourchali, Masoumeh
- Deidari
- Kong, Youngsun
- Lazaro, Jesus
- Leonhardt, Steffen
- Leutheuser, Heike
Li, Wen
Liu, Kai-Chun
Massaroni, Carlo
Mcginnis, Ryan
Nam, Sungwoo
Noh, Yeonsik
Oubre, Brandon
Ravi, Daniele
Saikia, Manob
Sanchez, Benjamin
Sazonov, Edward
Shandhi, Md Mobashir
Shayvat, Hemant
Shull, Peter
Solanki, Dhavali
Sun, Sarah
Tamura, Toshiyo
Vanrumste, Bart
Watson, Amanda
Zhang, Yuan
Zhang, Zhiqiang
Zhu, Xin

Prakash, Punit
Ranji, Mahsa
Saccomandi, Paola
Soda, Paolo
Yoshizawa, Makoto

Theme 08. Biorobotics and Biomechanics
Abdalá Elias, Leonardo
Busha, Brett
Cappello, Leonardo
Falotico, Egidio
Forner-Cordero, Arturo
Iacovacci, Veronica
Padilha Lanari Bô, Antonio
Paternó, Linda
Patton, James (Jim)
Sanguineti, Vittorio
Tiseo, Carlo

Theme 10. Biomedical and Health Informatics
Afghah, Fatemeh
Curcin, Vasa
Duncan, Dominque
Enayati, Moein
Golemati, Spyretta
Gurel, Nil
Kyriacou, Efthyvoulos
Lehocki, Fedor
Maglaveras, Nikolaos
Marozas, Vaidotas
Mavroudi, Seferina
Nugent, Chris
Pio, Gianvito
Spicher, Nicolai
Trajkovik, Vladimir
Vehkaoja, Antti
Zarkogianni, Konstantia

Theme 11. Biomedical Engineering Education and Society
Kark, Lauren
Van Oostrom, Hans

Theme 12. Technology for Women & Children’s Health/Equity and Access for Well-health
Armour, Chloe
Bello, Valentina
Dagliati, Arianna
Miliou, Ioanna
Nicora, Giovanna
Qiao, Mengyun
Sacchi, Lucia
Sampri, Alexia
Spiliopoulou, Myra
Taheri, Golnaz
Vera, Cecilia

Special Associate Editors for Minisymposia and Special Sessions
Fernanda Cabrera-Umpiérrez, Maria
Chen, Jie
Ding, Lei
Jiang, Xiaoyi
Otto, Kevin
Pena, Andres
Saccomandi, Paola

Special Associate Editors for Research Poster 1-page papers:
Brattain, Laura
Cabrera-Umpierrez, Maria
Chadalavada, Sriram
Chen, Xinlin
Huang, Helen
Khalifa, Adam
Kota, Srinivas
Kumar, Achint
Lee, Ej
Messano, Al
Otto, Kevin
Pena, Andres
Procopio, Anna
Vinjamuri, Ramana

Special Associate Editors for Student Award Paper Competition:
Astolfi, Laura
Heldt, Thomas
Khalil, Mohammad
Liu, Jiaen
Penzel, Thomas
Yuan, Han
Zhang, Yingchun
Paper Reviewers

Aalami, Oliver
Abasolo, Daniel
Abbasi, Hamid
Abd Wahed, Manal
Abdollahi, Nasim
Abdou, Abdelrahman
Abdulateef, Shima
Abdulsadig, Rawan
Abeysekara, Lahiru
Abouhossein, Alireza
Acharya, K. Aneesha
Ademoglu, Ahmet
Adib, Edmond
Aerts, Jean-Marie
Ahmed, Hanya
Ahmed, Beena
Aib, Weiwei
Akan, Aydin
Akay, Yasemin
Akazawa, Jun
Akbugday, Burak
Akhtar, Muhammad
Aktas Dincer, Hayriye
Al Abed, Amr
Al Amidie, Muthana
Al Qurri, Ahmed
Al-Nashash, Hasan
Al-Timemy, Ali
Alawieh, Hussein
Alba, Celina
Albanese, Antonio
Alcaraz, Raúl
Aletti, Federico
Alharbi, Yousef
Ali, Hussam
Alinejad-Rokny, Hamid
Alirezaie, Javad
Alivar, Alaleh
Aljama-Corrales, Tomas
Alkhadhr, Shaikhah
Almalaysha, Mohammed
Almasri, Reem
Almakkawy, Mohammad
Alqarni, Afnan
Alshahrani, Mohammed
Alsisa, Pablo
Alty, Steve
Alvarez, Daniel
Amanipour, Reza
Amin, Abu Bony
Amini, Amir
An, Junmo
Anam, Khairul
Anastasios
Anaz, Aws
Andrade, Rafael
Angelucci, Stefano
Annaheim, Simon
Annavarapu, Ramesh
Naidu
Anus, Paul
Antani, Sameer
Antonacci, Yuri
Antonacci, Carla
Antonakakis, Marios
Antony, Bhavna
Arce Diego, José Luis
Arcobelli, Valerio
Argha, Reza
Argus, Finbar
Arjona, Laura
Arjunan, Sridhar
Armour, Chloe
Arnulfo, Gabriele
Artoni, Fiorenzo
Asifiriya, Tuba
Asmare, Melkamu
Asplund, Maria
Astarita, Davide
Athanasioú, Maria
Attux, Romis
Averna, Alberto
Avolio, Alberto
Awang, Mat Kamil
Azarmi, Farzad
Azevedo, Christine
B, Lakshmipriya
Babarahmati, Keyhan
Kouhkilou
Bachhuber, Simon
Baddour, Natalie
Baek, Changhoon
Baek, Hyun Jae
Baghestanibazoki, Farnoush
Bai, Jun
Bai, Xiaoxiao
Baig, Nauman
Bailly, François
Bailon, Raquel
Bajic, Dragana
Balbinot, Alexandre
Balestra, Gabriella
Baptista, Roberto
Bara’, Chiara
Barban, Federico
Barbieri, Riccardo
Barbour, Randall
Bari, Vlasta
Barile, Francesco
Barnett, Cole
Baselli, Giuseppe
Baskaran, Vikraman
Bastos, Teodiano
Battiston, Sara
Baumont, Mathias
Bazil, Jason
Becker, Maximilian
Bector, Kartikeya
Behnam, Hamid
Belsare, Prajakta
Bender, Theresa
Bennett, Alexis
Bernal, Guillermo
Bernardi Bagestiero, Leila
Bersch-Porada, Ines
Bhagavatula, Vijayakumar
Bhalerao, Shailesh
Bhattacharya, Samayan
Bhattacharya, Appy
Bialkowski, Konstanty
Bian, Junguo
Bianchi, Anna Maria
M.
Bianchi, Leonardo
Bigan, Cristin
Bijnazadeh, Maryam
Bird, Christopher
Biswas, Angona
Blanco-Velasco, Manuel
Bocchi, Leonardo
Bogdanski, Martin
Bojorges-Valdez, Erik
Bonnet, Stephane
Bonnetblanc, François
Borthakur, Debanjan
Boruah, Abhijit
Boswell, Misque
Boubchir, Larbi
Boudaoud, Sofiane
Brattain, Laura
Braund, Taylor
Brooks, Frank
Bru, Javier
Buchner, Teodor
Burattini, Laura
Busch, Simon V.
Busha, Brett
Buteau, Etienne
Buttarano, Veronica
Byrd, Israel
Cabrera, Sergio
Cai, Siqi
Cain, Stephen
Cairo, Beatrice
Camilleri, Kenneth
Candra, Henry
Fedorin, Illia
Feng, Tiantian
Feng, Kexin
Fenoglio, Elena
Fenster, Aaron
Fernández Leal, Ángel
Ferrandez, Jose Manuel
Ferrari, Rafael
Ferrario, Manuela
Ferreira, Carlos Alexandre
Feruglio, Sylvain
Filos, Dimitrios
Filtjens, Benjamin
Fiorentino, Maria Chiara
Fiorillo, Luigi
Fiorini, Laura
Fischer, Georg
Fletcher, Richard
Flores, Francisco
Flotho, Philipp
Fontana, Juan Manuel
Forner-Cordero, Arturo
Fotopoulos, Dimitris
Fragomeni, Gionata
Franchi De' Cavalieri, Mattia
Franco, Enrico
Frene-Robin, Marie
Friedrich, Christoph M.
Frizera Neto, Anselmo
Frounchi, Javad
Fuentes Alvarez, Jose Ruben
Fujiwara, Koichi
Fukuoka, Yutaka
Fumene Feruglio, Paolo
Furia, Leonardo
Furqan, Mohammad
Shaheryar
Gaire, Sunil
Gallo, Diego
Ganapathy, Nagarajan
Gandolfi, Daniela
Gao, Chenyu
Gao, Qinhai
García Bravo, Sara
Garcia-Gonzalez, Maria Teresa
Gare, Suman
Garrett, Ariane
Garrett, Amy
Gelpi, Francesca
Geoghegan, Rory
Gerlach, Thomas
Germany Morrison, Enrique
Germar, Carina
Gholamhosseini, Hamid
Ghosh, Tonmoy
Giardini, Mario Ettore
Gidado, Iman
Gil, Eduardo
Gil Rosa, Bruno
Miguel
Giraldo Giraldo, Beatriz F.
Gohain Baruah, Hilly
Gokce, Kutal
Gómez, Carlos
González, Alejandro
González Ballester, Miguel Ángel
Gonzalez-Camarena, Ramon
Gouveia, Sónia
Granstedt, Jason
Grooby, Ethan
Gu, Xiao
Guan, Weilin
Gui, Thomas
Guiot, Caterina
Guiraud, David
Guo, Xiaoli
Guo, Yueqi
Gurchiek, Reed
Gurel, Nil
Gutru, Philipp
Haab, Lars
Hackley, Steven A.
Haddadi Avval, Atlas
Hadjileontiadis, Leonios
Haemmerich, Dieter
Haghi, Mostafa
Haidegger, Tamas
Hajarian, Amin
Halder, Arita
Hallberg, Josef
Hamadi Charef, Brahim
Hämäläinen, Meri
Hamid, Tarek
Hamilton-Fletcher, Giles
Han, Chengzong
Han, Jinpei
Harris, Arief
Harris Bozer, Amber
Hassan, Umer
Hatibaruah, Rakcinpha
Hayn, Dieter
He, Junyan
Hekman, Edsko
Hemm, Simone
Hemmert, Werner
Herrmann, Judy
Hernandez, Alher Mauricio
Hernandez, Antonio
Hernando, David
Hevia-Montiel, Nidiyare
Heywood, Daniel
Hiroi, Noriko
Hobbs, David
Hofmann, Ulrich
Holett, Orlando
Honeine, Paul
Hoog Antink, Christoph
Hori, Junichi
Hortal Quesada, Enrique
Hossain, Md Billal
Hou, Zeng-Guang
Houben, Richard
Hsieh, Kuan Yu
Hsieh, Ezekiel
Hsieh, Chia-Yeh
Hu, Zhanli
Hua, Rui
Huang, Ruisen
Huang, Hsien-Yung
Huang, Ming
Huang, Sicong
Huegel, Joel
Hui, Hui
Hülkenberg, Alfred
Humeau-Heurtier, Anne
Hussain, Hanaa
I. K, Sibghatullah
Iacovacci, Veronica
Iaizzo, Paul Anthony
Iberite, Francesco
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Editor’s Notes

The 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society hosted an electronic paper submission. The submitting Author was responsible for ensuring the document was viewable and absent of errors. Said errors or viewing restrictions would prevent the Conference from including the paper in Digital Proceedings.

All conference papers were peer-reviewed by experts chosen by the Conference Editorial Board.
Technical Program – Monday, July 15th

Registration (Monday)
8:00:00 AM - 7:00:00 PM
Room: Central Registration Counter

Speaker Ready Room (Monday)
8:00:00 AM - 5:00:00 PM
Room: El Paso 1-2

Analysis of Reliability Data on Medical Devices and Equipment
8:30:00 AM - 12:30:00 PM
Room: Coronado C&D

Audience: This workshop for managers, engineers, and statisticians provides latest methodology for collecting and analyzing reliability data in order to make decisions on designing, developing, testing, manufacturing, and servicing equipment and passing FDA reliability requirements. Participants should have a basic statistics course.

Content

- Life Distributions — Weibull and lognormal life distributions, distribution function (cdf), reliability function, percentage failing during warranty and design life, failure rate, competing failure modes.
- Graphical Analysis of Life Data — Advantages of data plots, population and sample, types of data (complete, singly censored, multiply censored, interval, competing failure modes), information sought, how to construct and interpret plots.
- Computer Analysis of Life Data — Information sought, estimates, confidence limits, model checks, survey of software.
- Repair Data Analysis — Types of repair (recurrence) data, medical applications, information sought, MCF estimate, competing failure modes, Poisson model, software.
- Accelerated Testing — Acceleration methods and models for life and degradation, test plans, data plots, computer analyses, assess the model and data.
- Survey of Other Reliability Topics
- Reliability Demonstration Tests to satisfy FDA requirements
- References and Resources
- ASA Section on Medical Devices and Diagnostics

Presenter: Wayne Nelson
Wayne Nelson Statistical Consulting, United States
**Impedance Spectroscopy for Neural Applications**

8:30:00 AM - 12:30:00 PM  
*Room: Coronado E-G*

This full-day course is intended for chemists, physicists, materials scientists, and engineers with an interest in applying electrochemical impedance techniques to study a broad variety of electrochemical processes. The attendee will develop a basic understanding of the technique, the sources of errors in impedance measurements, the manner in which experiments can be optimized to reduce these errors, and the use of graphical and regression methods to interpret measurements in terms of meaningful physical properties. The content will follow the textbook coauthored by Prof. Mark Orazem, and the students will be guided through the use of the measurement program recently published by Orazem's group. Topics to be covered—The motivation for using impedance spectroscopy advantages as compared to other transient techniques and the conditions under which its use is ideally suited,—The basic concepts of how impedance is measured,—Proper selection of experimental parameters,—Graphical representation of impedance data, including methods to extract some physically meaningful parameters,—Constant-phase elements,—Application of electrical circuit analogues,—The meaning of the Kramers-Kronig relations, and—Use of the measurement model program to assess error structure and regress custom models. The concepts will be illustrated by applications to electrodes used for neural sensing and stimulation. A list of suggested references will be provided. This course introduces model development based on proposed reaction mechanisms, statistical analysis of impedance data, and regression analysis.

*Presenter: Mark Orazem  
University of Florida, United States*

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**Best Practices for Designing New Exoskeletons and Exosuits**

8:30:00 AM - 12:30:00 PM  
*Room: Fiesta 9&10*

Despite an increasing number of exoskeletons and exosuits being developed around the world, there is a lack of information and consensus on best practices for the engineering design process for these wearable technologies. There is a plethora of publications describing specific devices and testing of the devices, but a dearth of publications on how to design the devices. We will bring together experts on exoskeletons and exosuits to discuss their experiences designing wearable technology for assisting human movement. The overall goal is to highlight, document, and rate the best engineering practices for developing exoskeletons and exosuits given principles of engineering and current understanding of human biomechanics and control. The discussion and debate will include preparation of a review manuscript for submission to an EMBC journal.

*Presenter: Daniel Ferris  
University of Florida, United States*
Getting Started with Biomedical Engineering Education Research Methods
8:30:00 AM - 12:30:00 PM
Room: Fiesta 1&2

This interactive workshop is designed for biomedical engineering faculty interested in starting research in biomedical engineering education. It provides a pathway for navigating the development of an engineering education research project from A to Z and consists of three parts: • Part 1: Research in Biomedical Engineering Education • Part 2: Identifying Your Research Space • Part 3: Developing Your Research Methods, Data Collection, and Dissemination Faculty will have the opportunity to work through a set of scaffolded activities during each part to identify a research area of interest and brainstorm potential research methods. By the end of the workshop, faculty should understand the steps necessary to establish a rigorous and ethically sound study in biomedical engineering education. Participants will receive a compilation of resources and best practices to start their biomedical engineering education research.

Presenters: May Mansy{1}, Sindia Rivera-Jimenez{1}, Karin Jensen{2}
{1}University of Florida, United States; {2}University of Michigan, United States

Leveraging Artificial Intelligence for Enhanced Processing of Biomedical Signals
8:30:00 AM - 12:30:00 PM
Room: Fiesta 3&4

In recent years, the integration of artificial intelligence (AI) techniques in biomedical signal processing has revolutionized the way we analyze and interpret complex physiological data. Researchers can leverage AI to extract valuable insights from biomedical signals, enabling more accurate diagnostics, personalized monitoring, and effective treatment strategies. This session explores the potential of AI algorithms, including machine learning and deep learning, to enhance the analysis and interpretation of biomedical signals. During an interactive session, participants will explore real-world practical scenarios such as electrocardiogram (ECG) signal reconstruction, fetal and maternal ECG separation, anomaly detection in biomedical signals, and time-frequency-based convolutional neural network classification of electroencephalogram (EEG). In addition, participants will learn about IEC 62304 certification for AI models, an international standard required for medical device software development. The workshop will be led by experienced researchers in AI and biomedical signal processing. Join us and be at the forefront of the AI revolution in biomedical signals analysis. The workshop is suitable for individuals with all levels of experience in signal processing and AI. While no prior knowledge is required, experienced users will benefit from the introduction of new tools, tips, and tricks for applying advanced techniques to biomedical signals.

Presenters: Reza Fazel-Rezai, Akhilesh Mishra, Sharon Kim, Garima Sharma
MathWorks, United States
In this era of rapid advancements in neurotechnology, our workshop of NeuroWearX delves into the synergistic integration of human, AI, and machine through wearable/implantable neural interfacing technologies, revolutionizing healthcare for equity and accessibility for human everyday life assistance and augmentation. Our focus is on the development of neural interfaces and the design of interaction technologies, including biosensors, wearable robotics, Virtual/Augmented Realities and human-AI interactions, with a strong commitment to patient-centric, clinical outcome-driven solutions. To achieve the maximum user experiences and democratization of neural technologies, we will also investigate the background principles of neuroscience and behavioral psychology to understand how humans interact with technology at a cognitive and physiological level. It aims to inform the design of wearable devices in a way that maximizes user acceptance, comfort, efficiency, and overall satisfaction. For example, by understanding the neural mechanisms underlying proprioception (our sense of body position and movement), designers can create wearable devices that provide feedback in a manner that aligns with our brain’s expectations, making the devices feel more like an extension of our own body. In addition, our workshop promotes translational neurotechnologies. We will also navigate the path from research to market, discuss the topics of how to conduct effective technology transfer, and the commercialization of these technologies for a diverse range of populations.

Presenters: Ker-Jiun Wang\(^4\), Ramana Vinjamuri\(^3\), Maryam Alimardani\(^2\), Zhi-Hong Mao\(^4\), Midori Sugaya\(^1\)
\(^1\)Shibaura Institute of Technology, Japan; \(^2\)Tilburg University, Netherlands; \(^3\)University of Maryland Baltimore County, United States; \(^4\)University of Pittsburgh, United States

Ultra-High Density EEG system, Cortical Mapping for Epilepsy patients, Wearable Biomedical Sensors and Systems
8:30:00 AM - 12:30:00 PM
\textit{Room: Monterrey 1}

Monday AM Coffee Break
10:00:00 AM - 10:30:00 AM
\textit{Room: Fiesta Lobby}

Exhibitor Set-Up
1:00:00 PM - 5:00:00 PM
\textit{Room: Veracruz Hall}
Contactless Sleep Monitoring: Sleep stages, Fiber-Optic Sensors, Drowsiness — Limitations, Challenges, and Future Perspectives
1:30:00 PM - 7/22/2024 5:30:00 PM
Room: Coronado C&D

Sleep is fundamental for physical and mental well-being, yet traditional methods like polysomnography (PSG) pose challenges due to their invasiveness and cost. This workshop explores cutting-edge advancements, focusing on key areas that redefine sleep analysis: Contactless Sleep Monitoring: In response to the drawbacks of traditional polysomnography (PSG), non-contact sleep monitoring systems are at the forefront. These systems, embracing non-invasive approaches, monitor cardiorespiratory parameters without impeding movement. Innovations in mobile methods and contactless monitoring, including fiber-optic sensors, redefine sleep analysis by providing comfort and accessibility without compromising accuracy. Sleep Stages: Understanding sleep stages is crucial for comprehensive analysis. Automation in sleep stage scoring, driven by recent developments in non-intrusive technologies, enables efficient and objective analysis of physiological parameters during different sleep phases. Fiber-optic Sensors: Incorporating fiber-optic sensors in Ballistocardiography (BCG) data acquisition is a breakthrough. This technology, compared to mechanical sensors, offers a less intrusive yet highly sensitive method for capturing cardiac activity’s mechanical movements. Evaluating the trade-offs between mechanical and fiber-optic methods is essential for non-invasive sleep monitoring. Drowsiness: Drowsiness, a significant contributor to accidents, especially during activities like driving, is emphasized. Public awareness campaigns are crucial as individuals may not fully recognize symptoms like microsleep. Reliable drowsiness detection systems, using advanced sensors and algorithms, are pivotal in enhancing road safety by alerting drivers in real-time. In conclusion, the evolution towards non-contact sleep monitoring, understanding sleep stages through automation, incorporating fiber-optic sensors, and effective drowsiness detection will be evaluated for limitations, challenges, and future perspectives. This enhances comfort, accessibility, and accuracy in sleep analysis while addressing crucial aspects of overall well-being, safety, and accident prevention.

Presenters: Natividad Martinez Madrid{2}, Ralf Seepold{1}, Maksym Gaiduk{1}, Mostafa Haghi{1}, W. Daniel Scherz{1}, Ángel Serrano Alarcón{2}
{1}HTWG Konstanz—University of Applied Sciences, Germany; {2}Reutlingen University, Germany

Impedance Spectroscopy for Neural Applications - Part 2
1:30:00 PM - 7/22/2024 5:30:00 PM
Room: Coronado E-G

Best Practices for Designing New Exoskeletons and Exosuits - Part 2
1:30:00 PM - 7/22/2024 5:30:00 PM
Room: Fiesta 9&10
The increasing availability of edge devices has the capacity to fulfill the health tracking requirements of the aging global population and the rising number of people with chronic health conditions. Referred to as digital biomarkers in the relevant literature, digital devices measure and collect physiological and behavioral data through portables, wearables, implantables, or digestibles that explain, influence, or predict health-related outcomes. This is achieved by systematically analyzing data, often using machine learning techniques. Developing digital biomarkers relies not only on mobile technologies but also on hardware-specific software such as operating systems and apps to collect health data. Consequently, digital biomarkers developers often encounter challenges related to specific hardware and software that hinder the creation of universally applicable software for data collection and incorporation of machine learning models across different devices. In this half-day hands-on tutorial, participants will be introduced to CLAID, our versatile open-source middleware framework for digital biomarker development. CLAID is designed to bridge the gap between different operating systems, ensuring seamless integration and communication in an edge-cloud setup. The workshop includes a practical segment on using CLAID for developing a smartwatch data-acquisition app and a hands-on session for deploying a machine-learning model using real-time data from the device.

Presenters: Filipe Barata{2}, Patrick Langer{1}, Fan Wu{2}, Jinjoo Shim{2}
{1}ETH Zürch, Switzerland; {2}ETH Zürich, Switzerland
# Model-Based Design for Cardiovascular Monitoring Devices: Examples with Oscillometric and Continuous Blood Pressure Methods

**Overview:** This workshop is designed for industry professionals and researchers interested in model-based design for cardiovascular monitoring devices with a focus on oscillometric and continuous blood pressure devices. By utilizing uncertainty propagation and sensitivity analysis, the workshop addresses some design considerations that are often overlooked. Examples include exploring the effects of sampling rates on the accuracy of the pulse arrival time-based continuous blood pressure monitoring and understanding how artery stiffness influences the accuracy of oscillometric devices. The workshop is built upon and adapted from the recently published book by Dr. Bolic, “Pervasive Cardiovascular and Respiratory Monitoring Devices: Model-Based Design.”

**Objectives and Benefits to Participants:**
- Explore end-to-end system modeling, which includes models of the transducer-human body interface, circuits, and signal processing algorithms.
- Conduct hands-on simulations using basic Matlab®/Simulink® functionalities to explore system behaviour, providing participants with relevant code.
- Introduce uncertainty propagation and sensitivity analysis to evaluate various design choices and emphasize their importance in designing robust monitoring devices.

**Workshop Structure:**

**Part 1: Fundamentals of Model-Based Design (30 min)**
1. Introduction to model-based design for biomedical devices
2. Uncertainty propagation and sensitivity analysis

**Part 2: Modeling an Oscillometric Device (1 hour)**
3. Modeling cuff-tissue-artery interface to generate the signals, an oscillometric device and an oscillometric algorithms
4. Simulating a basic device using Matlab®/Simulink®/Simscape

**Part 3: Modeling Continuous Blood Pressure Monitoring Device (1 hour)**
5. Introduction to models based on pulse arrival time
6. Developing continuous blood pressure measurement devices using machine learning methods

**Part 4: Conclusion – model-based approach in designing other cardiovascular devices (15 min)**
This workshop offers a focused and practical exploration of model-based design principles for blood pressure monitoring devices. Participants will leave with a solid understanding of key concepts and hands-on experience, enabling them to apply these principles to their own projects or studies in the field of biomedical engineering.

**Presenter:** Miodrag Bolic
**University of Ottawa, Canada**
In this workshop we will talk about computational intelligence and neural interfacing tools that we have developed to investigate the signature events of iEEG and ECoG such as high frequency oscillations (HFOs) in 80-500hz range and test their value for accurate and fast identification of SOZ. Specifically, in the spirit of “learning from data”, using computational tools based on recent advances in sparse signal processing and machine learning techniques, we discovered distinguishing HFO patterns directly from the continuous iEEG data from both adult and pediatric patients and test their prognostic value by correlating the spatial distribution of detected events to clinical findings. Spinal cord stimulation (SCS) appears among the advanced pain therapies as many chronic pain syndromes remain refractory to medical treatment. It is considered effective when patients report greater than 50% pain relief (responders). However, significant subsets of patients remain sub-optimally treated. Despite the technological advancements in the chronic pain and neuromodulation fields, there is still lack of a clear understanding of which patient may benefit from which SCS treatment. Given that pain is a complex phenomenon resulting from dynamic interactions between sensory, cognitive, and emotional processes, study of neural pathways of chronic pain under SCS can help to characterize the interactions between these dimensions and consequently to develop optimal individualized stimulation paradigms. Towards this end, in this study, high-density EEG signals together with the patient reported outcome (PRO) measures, which are considered as gold standard assessment tool to evaluate efficacy in chronic pain management, were recorded from chronic pain patients who were scheduled for SCS surgery at 3 major time points: 1 week before surgery (resting state), during SCS surgery (intraoperative, SCS ON/OFF), and 3 months after the SCS surgery (postoperative, SCS ON/OFF). Obtained results suggest that changes in alpha peak frequency and alpha-theta power ratio might be correlated to SCS-induced pain relief. More importantly, the achieved results indicate that well-designed machine learning (ML) algorithms can identify the potentially more informative neural features and discriminate responders from non-responders using combination of composite pain scores, clinical information, and demographics.

Presenters: Nuri Ince{3}, Ilknur Telkes{1}, Leonhard Schreiner{2}, Milena Korostenskaja{4}
{1}Florida Atlantic University, United States; {2}g.tec medical engineering GmbH, Austria; {3}Mayo Clinic, United States; {4}The Institute of Neuroapproach, United States
## Technical Program – Monday, July 15th

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<td>TC Forum</td>
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Technical Program – Tuesday, July 16th

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<tr>
<td>Tuesday AM Coffee Break</td>
<td>8:00:00 AM - 8:30:00 AM</td>
<td>Veracruz Hall</td>
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<tr>
<td>Exhibit Hall Open (Tuesday)</td>
<td>8:00:00 AM - 6:00:00 PM</td>
<td>Veracruz Hall</td>
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<tr>
<td>Student Paper Competition #1</td>
<td>8:30:00 AM - 10:00:00 AM</td>
<td>Cancun</td>
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<tr>
<td>Computational Models of Medical Devices</td>
<td>8:30:00 AM - 10:00:00 AM</td>
<td>Fiesta 1&amp;2</td>
</tr>
</tbody>
</table>

ID: 7101
**In Silico Drug Delivery Modeling of a Novel Everolimus Coated Balloon**
Grigorios Kotoulas\(^2\), Vasileios Loukas\(^3\), Georgia Karanasiou\(^2\), Antonis Sakellarios\(^6\), Vasileios Pezoulas\(^4\), Christos Katsouras\(^2\), Lambros Michalis\(^2\), Arsen Semertzoglou\(^1\), Anargyros Moulas\(^7\), Liesbet Geris\(^5\), Dimitrios I. Fotiadis\(^4\)
\(^1\)Rontis Corporation S.A., Greece; \(^2\)University of Ioannina, Greece; \(^3\)University of Ioannina, FORTH, Greece; \(^4\)University of Ioannina, FORTH-BRI, Greece; \(^5\)University of Liège, Katholieke Universiteit Leuven, Belgium; \(^6\)University of Patras, University of Ioannina, FORTH-BRI, Greece; \(^7\)University of Thessaly, Greece

ID: 7236
**A Multiscale Parametric Study to Drug Delivery Modeling in Stented Arteries**
Dimitrios Pleouras\(^1\), Vasileios Loukas\(^2\), Georgia Karanasiou\(^1\), Anastasia Antonaki\(^1\), Dimitrios I. Fotiadis\(^3\), Antonis Sakellarios\(^4\)
\(^1\)University of Ioannina, Greece; \(^2\)University of Ioannina, FORTH, Greece; \(^3\)University of Ioannina, FORTH-BRI, Greece; \(^4\)University of Patras, University of Ioannina, FORTH-BRI, Greece

ID: 6123
**Hydrodynamic Performance of an Optimized Spiral Groove Bearing to Improve Plasma Skimming Effect**
Ming Jiang, Wataru Hijikata
Tokyo Institute of Technology, Japan
ID: 7318
**Mimicking Human Laryngeal Tissues for a Soft Artificial Prosthesis**
Jasmine Pozzi{2}, Arianna Conte{2}, Lucrezia Lorenzon{2}, Martina Maselli{2}, Maria Raffaella Marchese{1}, Andrea Nacci{3}, Matteo Cianchetti{2}
{1}Policlinico Universitario A. Gemelli IRCSS, Italy; {2}Scuola Superiore Sant’Anna, Italy; {3}University Hospital of Pisa, Italy

ID: 6231
**New Insulin on Board Estimation for Artificial Pancreas Systems**
Juan David Romero-Ante, Juliana Manrique-Córdoba, José María Vicente-Samper, Jesús Cases-Hurtado, Miguel Ángel De La Casa-Lillo, José Maria Sabater-Navarro
Miguel Hernandez University of Elche, Spain

ID: 6528
**Coil Orientation and Stimulation Threshold in Transcranial Magnetic Stimulation (TMS)**
Shaghayegh Abbasi{3}, Matt David{3}, Vincent Leung{1}, Peter Asbeck{2}, Milan Makale{2}
{1}Baylor University, United States; {2}University of California, San Diego, United States; {3}University of Portland, United States

**Deep Learning Method for ECG Analysis & Arrhythmia Detection**
8:30:00 AM - 10:00:00 AM  
*Room: Coronado P&Q*  
*Session Chair: Nicolai Spicher and Olivier Meste*

ID: 7083
**A Hybrid GCN-LSTM Model for Ventricular Arrhythmia Classification Based on ECG Pattern Similarity**
Qing Lin{2}, Dino Oglić{1}, Hak-Keung Lam{2}, Michael Curtis{2}, Zoran Cvetkovic{2}
{1}AstraZeneca, United Kingdom; {2}King’s College London, United Kingdom

ID: 6182
**Electrocardiographic Classification Using Deep Learning with Lead Switching**
Tomoharu Iwata, Ryo Nishikimi, Ryohei Shibue, Masahiro Nakano, Kunio Kashino, Hitonobu Tomoike
NTT Corporation, Japan

ID: 7468
**Enhancing Explainability in ECG Analysis Through Evidence-Based AI Interpretabillity**
Philip Hempel, Theresa Bender, Nicolai Spicher
University Medical Center Göttingen, Germany

ID: 7121
**ECG-Based Daily Activity Recognition Using 1D Convolutional Neural Networks**
Suyeon Yun{1}, Sunghan Lee{1}, Gyeongbong Kim{1}, Sung Pil Cho{2}, Semin Ryu{1}, In Cheol Jeong{1}
{1}Hallym University, Korea; {2}MEZOO Co., Ltd., Korea
ID: 7175
**ECG Beat-By-Beat Classification Using Hybrid Transformer Neural Network Model in Smart Health**
I Hua Tsai, Bashir I. Morshed
Texas Tech University, United States

ID: 6219
**PPG-to-ECG Signal Translation for Continuous Atrial Fibrillation Detection via Attention-Based Deep State-Space Modeling**
Khuong Vo{2}, Mostafa El-Khamy{1}, Yoojin Choi{1}
{1}Samsung Device Solutions Research America, United States; {2}University of California, Irvine, United States

**Diagnostic Devices & Instrumentation**
8:30:00 AM - 10:00:00 AM
Room: Coronado D&E
Session Chair: Mahsa Ranji and Fanny Casado-Pena

ID: 6454
**Wearable Sensors for Cardiovascular Assessment of Manual Wheelchair Users**
Maja Goršič, Grace Fasipe, Jacob R. Rammer
University of Wisconsin-Milwaukee, United States

ID: 6836
**Correlation Between Timed-Up-and-Go Test and 6-Minute Walk Test in Patients with Peripheral Artery Disease**
Fabian Wiesmüller{3}, Andreas Prenner{4}, Andreas Ziegl{5}, Gihan El Moazen{2}, Robert Modre-Osprian{5}, Gerald Seinost{4}, Günter Silbernagel{4}, Dieter Hayn{1}, Günter Schreier{1}
{1}AIT Austrian Institute of Technology GmbH, Austria; {2}Institute of Neural Engineering, Graz University of Technology, Austria; {3}LBI, Austrian Institute of Technology GmbH, Austria; {4}Medizinische Universität Graz, Austria; {5}telbiomed Medizintechnik und IT Service GmbH, Austria

ID: 6960
**Point-of-Care Testing of Procalcitonin Using Lateral Flow Assay**
Jovita Rajesh Deodhar, Chengchen Zhang, Tianruo Guo, Ruier Xue, Mohit Naresh Shivdasani, Fei Deng
University of New South Wales, Australia

ID: 7314
**Minimally Invasive Needle for Local Glucose Tolerance Tests in Skin**
Noriko Tsuruoka, Yoichi Haga
Tohoku University, Japan

ID: 7417
**Objective Assessment of Acute Stress Disorder in Female Subjects Using Wearable Measures of Electrodermal Activity**
Andrew Peitzsch, Youngsun Kong, Hugo F Posada-Quintero, Ki Chon
University of Connecticut, United States
A Sentiment Pre-Trained Text-Guided Multimodal Cross-Attention Transformer for Improved Depression Detection
Shiyu Teng\(^2\), Shurong Chai\(^2\), Jiaqing Liu\(^2\), Tomoko Tateyama\(^1\), Lanfen Lin\(^3\), Yen-Wei Chen\(^2\)
\(^1\)Fujita Health University, Japan; \(^2\)Ritsumeikan University, Japan; \(^3\)Zhejiang University, China

Image Segmentation Using Machine Learning
8:30:00 AM - 10:00:00 AM
Room: Yucatan 2
Session Chair: Reza Avazmohammadi and Kaveri Thakoor

Interactive Image Selection and Training for Brain Tumor Segmentation Network
Matheus Cerqueira\(^1\), Flávia Sprenger\(^2\), Bernardo Teixeira\(^2\), Alexandre Falcão\(^1\)
\(^1\)Universidade Estadual de Campinas, Brazil; \(^2\)Universidade Federal do Paraná, Brazil

A Semi-Supervised Retinal Vessel Segmentation Method via Adaptive Uncertainty Estimation
Jia-Ming Hou\(^1\), Chih-Kuo Lee\(^2\), Yen-An Lin\(^1\), Po-Hsuan Tseng\(^1\)
\(^1\)National Taipei University of Technology, Taiwan; \(^2\)National Taiwan University Hospital, Taiwan

EffiSegNet: Gastrointestinal Polyp Segmentation Through a Pre-Trained EfficientNet-Based Network with a Simplified Decoder
Ioannis Vezakis\(^2\), Konstantinos Georgas\(^1\), Dimitrios I. Fotiadis\(^3\), George Matsopoulos\(^1\)
\(^1\)National Technical University of Athens, Greece; \(^2\)TECREANDO B.V., Netherlands; \(^3\)University of Ioannina, FORTH-BRI, Greece

SACH-Net: Shape-Adaptive Convolution and Hierarchical Topology Constraints Framework for Coronary Artery Segmentation
Zhuo Jin\(^1\), Shaoxuan Wu\(^1\), Zhizezhang Gao\(^1\), Xiaosong Xiong\(^2\), Xiao Zhang\(^1\), Jun Feng\(^1\)
\(^1\)Northwest University, China; \(^2\)ShanghaiTech University, China

Adapting Segment Anything Model for Ulcer Segmentation in Inflammatory Bowel Disease
Lingrui Cai, Ryan Stidham, Emily Wittrup, Kayvan Najarian
University of Michigan, United States

A Federated Stroke Segmentation to Impact Limited Data Institutions
Edgar Rangel\(^2\), Santiago Gómez\(^2\), Daniel Mantilla\(^1\), Paul Camacho\(^1\), Fabio Martinez Carrillo\(^2\)
\(^1\)FOSCAL Clinic, Colombia; \(^2\)Universidad Industrial de Santander, Colombia
### Innovations in Diagnosis & Monitoring of Pediatric & Prenatal Patients

8:30:00 AM - 10:00:00 AM  
**Room: Fiesta 5&6**  
Session Chair: Nancey Trevanian Tsai, Md and Srinivas Kota

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<thead>
<tr>
<th>ID</th>
<th>Title</th>
<th>Authors</th>
<th>Institutions</th>
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<tbody>
<tr>
<td>6375</td>
<td>Automated Intraoperative Visual Detection of Pediatric Epileptogenic Brain Lesions Using a Machine Learning Classifier</td>
<td>Naomi Kifle, Saige Teti, Bo Ning, Daniel Donoho, In-Seok Song, Jeremy Kang, Ava Jiao, Ashley Yoo, Chima Oluigbo, Robert Keating, Richard Jaepyong Cha</td>
<td>Children’s National Hospital, United States</td>
</tr>
<tr>
<td>6510</td>
<td>Determination of Anal Sphincter Injury Location Using Impedance Spectroscopy in Obstetric Patients</td>
<td>Marcel Młyńczak{5}, Maciej Rosol{5}, Kacper Korzeniewski{5}, Piotr Iwanowski{3}, Stefano Salvatore{4}, Carlo Ratto{1}, Antonino Spinelli{2}, Katarzyna Borycka{3}</td>
<td>{1}Gemelli Isola, Catholic University, Italy; {2}Humanitas University, Huminatas Research Hospital, Italy; {3}OASIS Diagnostics, Poland; {4}University Vita e Salute, IRCCS San Raffaele, Italy; {5}Warsaw University of Technology, OASIS Diagnostics, Poland</td>
</tr>
<tr>
<td>6533</td>
<td>Combination of Empirical Mode Decomposition and Hjorth Parameters for Prediction of Preterm Labor Using Electrohysterogram Signals</td>
<td>Somayeh Mohammadi Far{1}, Matin Beiramvand{3}, Mohammad Shahbakhti{2}, Piotr Augustyniak{1}</td>
<td>{1}AGH University of Krakow, Poland; {2}Kaunas University of Technology, Lithuania; {3}Tampere University, Finland</td>
</tr>
<tr>
<td>7434</td>
<td>An Explainable and Conformal AI Model to Detect Temporomandibular Joint Involvement in Children Suffering from Juvenile Idiopathic Arthritis</td>
<td>Lena Todnem Bach Christensen, Dikte Straadt, Stratos Vassis, Christian Marius Lillelund, Peter Bangsgaard Stoustrup, Ruben Pauwels, Thomas Klit Pedersen, Christian Fischer Pedersen</td>
<td>Aarhus University, Denmark</td>
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<td>7955</td>
<td>Development of a NIR-Based Infant Iris Scanner</td>
<td>Md Jahangir Alam Khondkar, Md Abdul Baset Sarker, Masudul Haider Imtiaz, Stephanie Schuckers</td>
<td>Clarkson University, United States</td>
</tr>
<tr>
<td>8054</td>
<td>Age-Based Heart Sound Segmentation for Accessible Pediatric Cardiovascular Disease Screening</td>
<td>Ethan Grooby, Yang Yi Poh, Faezeh Marzbanrad</td>
<td>Monash University, Australia</td>
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## Medical Image Analysis for Diagnosis/Prognosis

8:30:00 AM - 10:00:00 AM  
**Room: Yucatan 1**  
Session Chair: Wajahat Ali Khan and Fan Lam

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<tr>
<th>ID</th>
<th>Title</th>
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<tr>
<td>6127</td>
<td><strong>Enhancing Breast Mass Diagnosis: Leveraging Temporal Subtraction for Accurate Classification of Benign and Malignant Masses</strong></td>
<td>Kosmia Loizidou{3}, Galateia Skouroumouni{2}, Gabriella Savvidou{5}, Anastasia Constantinidou{5}, Eleni Orphanidou Vlachou{1}, Annessa Yiallourou{6}, Christos Nikolaou{4}, Costas Pitris{3}</td>
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<td></td>
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<td>{1}EIMC Clinic Strovolos, Cyprus; {2}German Oncology Center, Cyprus; {3}KIOS CoE, University of Cyprus, Cyprus; {4}Limassol General Hospital, Cyprus; {5}University of Cyprus, Bank of Cyprus Oncology Centre, Cyprus; {6}University of Cyprus, Nicosia General Hospital, State Health Services, Cyprus</td>
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<td>6272</td>
<td><strong>An Explainable Transfer Learning Method for EEG-Based Seizure Type Classification</strong></td>
<td>Lan Wei, Catherine Mooney</td>
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<td>University College Dublin, Ireland</td>
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<td>6376</td>
<td><strong>OCTA-Based AMD Stage Grading Enhancement via Class-Conditioned Style Transfer</strong></td>
<td>Haochen Zhang{2}, Anna Heinke{2}, Krzysztof Broniarek{1}, Carlo Galang{2}, Daniel Deussen{2}, Ines Nagel{2}, Katarzyna Michalska-Malecka{1}, Dirk-Uwe Bartsch{2}, William Freeman{2}, Truong Nguyen{2}, Cheolhong An{2}</td>
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<td>{1}Medical University of Gdańsk, Poland; {2}University of California, San Diego, United States</td>
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<td>6810</td>
<td><strong>Multi-Class Prediction of Cognitively Normal / Mild Cognitive Impairment / Alzheimer’s Disease Status in Dementia Based on Convolutional Neural Networks with Attention Mechanism</strong></td>
<td>Mingwei Yao, Jundong Liu, Yuping Pu, Kei Hang Katie Chan</td>
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<td>City University of Hong Kong, Hong Kong</td>
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<tr>
<td>8081</td>
<td><strong>C2P-GCN: Cell-to-Patch Graph Convolutional Network for Colorectal Cancer Grading</strong></td>
<td>Sudipta Paul{2}, Bulent Yener{2}, Amanda Lund{1}</td>
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<td></td>
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<td>{1}New York University, NYU Langone Hospitals, United States; {2}Rensselaer Polytechnic Institute, United States</td>
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<tr>
<td>6175</td>
<td><strong>Predicting Lymph Node Metastasis of Lung Cancer: A Two-Stage Multimodal Data Fusion Approach</strong></td>
<td>Danqing Hu{2}, Bing Liu{1}, Xiaofeng Zhu{2}, Xudong Lu{3}, Nan Wu{1}</td>
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<td></td>
<td></td>
<td>{1}Peking University Cancer Hospital and Institute, China; {2}Zhejiang Lab, China; {3}Zhejiang University, China</td>
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### Technical Program – Tuesday, July 16th

**Medical Image Processing: Tomography & Spectrometry**  
8:30:00 AM - 10:00:00 AM  
*Room: Fiesta 7&8*  
*Session Chair: Edgar Rangel Pieschacon and Wilson Silva*

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<th>ID</th>
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<tbody>
<tr>
<td>6007</td>
<td><strong>A Two-Step Framework for Multi-Material Decomposition of Dual Energy Computed Tomography from Projection Domain</strong></td>
<td>Di Xu{2}, Qihui Lyu{2}, Dan Ruan{1}, Ke Sheng{2}</td>
<td>{1}University of California, Los Angeles, United States; {2}University of California, San Francisco, United States</td>
</tr>
<tr>
<td>6773</td>
<td><strong>Synthesizing CTA Image Data for Type-B Aortic Dissection Using Stable Diffusion Models</strong></td>
<td>Ayman Abaid{2}, Muhammad Ali Farooq{2}, Niamh Hynes{1}, Peter Corcoran{2}, Ihsan Ullah{2}</td>
<td>{1}University Hospital Galway, University of Galway, Ireland; {2}University of Galway, Ireland</td>
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<tr>
<td>6937</td>
<td><strong>Hierarchical Auto-Labeling of Coronary Arteries on CT Coronary Angiography Images</strong></td>
<td>Jiangyun Li{2}, Zhongkang Lu{1}, Shuang Leng{3}, Xiaohong Wang{1}, Lohendran Baskaran{3}, Min Sen Yew{5}, Mark Chan{4}, Lynette Ls Teo{4}, Kee Yuan Ngiam{4}, Hwee Kuan Lee{1}, Liang Zhong{3}, Zhiping Lin{2}, Weimin Huang{1}</td>
<td>{1}Agency for Science, Technology and Research, Singapore; {2}Nanyang Technological University, Singapore; {3}National Heart Centre Singapore, Singapore; {4}National University Health System, Singapore; {5}Tan Tock Seng Hospital, Singapore</td>
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<tr>
<td>6955</td>
<td><strong>Monotone Accelerated Proximal Gradient Network for Bioluminescence Tomography Reconstruction</strong></td>
<td>Heng Zhang, Xiaowei He, Hongbo Guo, Shuangchen Li, De Wei, Yuqing Hou</td>
<td>Northwest University, China</td>
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<tr>
<td>8028</td>
<td><strong>NeuroMark PET: Replicable Positron Emission Tomography ICA Templates for Florbetapir and Florbetaben Radioligands</strong></td>
<td>Cyrus Eierud{2}, Zening Fu{2}, Helen Petropoulos{2}, Anastasia Bohsali{2}, Armin Iraji{2}, Melanie Ganz{3}, Cyril Pernet{1}, Vince D. Calhoun{2}</td>
<td>{1}Rigshospitalet, Denmark; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States; {3}University of Copenhagen, Denmark</td>
</tr>
<tr>
<td>6788</td>
<td><strong>An Accessible and Flexible Spectrometer for Teaching and Research in MRI Based on the Analog Discovery</strong></td>
<td>Steven Wright</td>
<td>Texas A&amp;M University, United States</td>
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Technical Program – Tuesday, July 16th

Methods & Data for AI-DSS
8:30:00 AM - 10:00:00 AM
Room: Durango 1
Session Chair: Prachi Agarwal and Nima Karimian

ID: 6177
KAMLN: A Knowledge-Aware Multi-Label Network for Lung Cancer Complication Prediction
Danqing Hu[2], Bing Liu[1], Xiaofeng Zhu[2], Xudong Lu[3], Nan Wu[1]
{1}Peking University Cancer Hospital and Institute, China; {2}Zhejiang Lab, China; {3}Zhejiang University, China

ID: 6554
Feature Engineering Assessment of Tumor Infiltrating Lymphocytes in Lung Adenocarcinoma
Giulia Bruschi[2], Agnese Sbrollini[2], Federica Pecci[2], Valeria Cognigni[2], Francesco Paoloni[2], Tommaso Galassi[2], Luca Cantini[1], Micaela Morettini[2], Rossana Berardi[2], Laura Burattini[2]
{1}Fortrea Inc., Italy; {2}Università Politecnica delle Marche, Italy

ID: 6712
Documenting Model Stability and Data Quality Improvement in Delirium Identification Using Explainable Artificial Intelligence (XAI)
{1}University of Houston, United States; {2}University of Toronto, Canada

ID: 6573
Graph Representation of Postoperative Patients for Opioids Refill Prediction: A Real-World Case Study
Ashok Choudhary, Cornelius Thiels, Hojjat Salehinejad
Mayo Clinic, United States

ID: 7828
Development of a Voice-Enabled Automated Sleep Survey System
Yang Qiu, Anwesh Mohanty, Robert L. Owens, Shamim Nemati
University of California, San Diego, United States

ID: 6936
Towards the Development of a FAIR-Compliant Biomedical Ontology for Colorectal Cancer
Vasileios Pezoulas[2], Christos Androutsos[1], Dimitrios I. Fotiadis[2]
{1}University of Ioannina, Greece; {2}University of Ioannina, FORTH-BRI, Greece
Technical Program – Tuesday, July 16th

Neural Interfaces: Electrodes
8:30:00 AM - 10:00:00 AM
Room: Coronado A
Session Chair: Tianruo Guo and Reza Abiri

ID: 6913
Response of Human Retinal Networks to Electrical Stimulation Using 3D Intra-Retinal Microelectrodes
Jian Li{2}, Keith Ly{2}, Aldrich Rongfeng Wang{2}, Michael Italiano{2}, Mohit Naresh Shivdasani{2}, David Tsai{2}, Jia-Yi Zhang{1}, Nigel Lovell{2}, Socrates Dokos{2}, Tianruo Guo{2}
{1}Fudan University, Australia; {2}University of New South Wales, Australia

ID: 7114
The Effect of Physical Structural Properties on Electrochemical Properties of Ruthenium Oxide for Neural Stimulating and Recording Electrodes
Yupeng Wu{2}, Miguel Figueroa Hernández{2}, Tian Lei{2}, Siddharth Jayakumar{2}, Rohan R. Lalapet{2}, Alexandra Joshi-Imre{2}, Mark E. Orazem{1}, Kevin J. Otto{1}, Stuart F. Cogan{2}
{1}University of Florida, United States; {2}University of Texas at Dallas, United States

ID: 7212
Development of a Low-Cost Electrospinner for Fabrication of Polyacrylonitrile Fibers as a Precursor to Flexible Carbon Neural Electrodes
Aleesha Caldwell, Orsolya Kékesi, Gregg Suaning
University of Sydney, Australia

ID: 7578
Analysis of Electrochemical Impedance Spectroscopy Data for Sputtered Iridium Oxide Electrodes
Henry Lutz{1}, Yupeng Wu{2}, Cynthia Eluagu{1}, Stuart F. Cogan{2}, Kevin J. Otto{1}, Mark E. Orazem{1}
{1}University of Florida, United States; {2}University of Texas at Dallas, United States

ID: 7760
Wireless Mouse EEG Device: Novel Design for Easy Operation
Mohamed Benomar, Xing Xia, Hai Zhang, Mao-Hsiang Huang, Manoj Vishwanath, Xiangmin Xu, Hung Cao
University of California, Irvine, United States

ID: 7947
HermEIS: A Parallel Multichannel Approach to Rapid Spectral Characterization of Neural MEAs
Akwasi Akwaboah, Ralph Etienne-Cummings
Johns Hopkins University, United States
ID: 6479
**A Study of Parkinson’s Disease with Minimally Invasive STN-DBS and Noninvasive EEG Electrodes**
Venkateshwarla Rama Raju{1}, Lavanya Neerati{2}
{1}CMR College of Engineering & Technology, India; {2}Osmania University, India

ID: 6985
**Impairments in Spatial Representations of Place Cells and Neural Rhythms in APP Knock-In Rat Model**
Xueling Wang{2}, Yimeng Wang{2}, Keliang Pang{1}, Bai Lu{3}, Yutao Tian{2}, Chenguang Zheng{2}
{1}Fudan University, China; {2}Tianjin University, China; {3}Tsinghua University, China

ID: 7090
**Shared-Task Self-Supervised Learning for Estimating Free Movement Unified Parkinson’s Disease Rating Scale III**
Mustafa Shuqair{1}, Joohi Jimenez-Shahed{2}, Behnaz Ghoraani{1}
{1}Florida Atlantic University, United States; {2}Icahn School of Medicine at Mount Sinai, United States

ID: 7098
**A Quantitative Method to Find the Maximum Level of Spinal Cord Compression in Degenerative Cervical Myelopathy**
Ali Fahim Khan{2}, Fauziyya Muhammad{2}, Grace Haynes{1}, Sanaa Hameed{2}, Lei Ding{1}, Zachary Adam Smith{2}
{1}University of Oklahoma, United States; {2}University of Oklahoma Health Sciences Center, United States

ID: 7187
**Heart Rate Variability-Based Model for Estimating the Severity of Orthostatic Hypotension in Patients with REM Sleep Behavior Disorder**
Shota Saeda{1}, Koichi Fujiwara{1}, Yukiyoshi Sumi{2}, Hiroshi Kadotani{2}
{1}Nagoya University, Japan; {2}Shiga University of Medical Science, Japan

ID: 7673
**Does Excessive Tonic Inhibition Cause Unstable Feedback in Parkinson’s Disease?**
Christopher Kelley{1}, Jeffrey Kauffman{2}
{1}Florida Polytechnic University, United States; {2}University of Central Florida, United States
Physiological Systems Modeling 1
8:30:00 AM - 10:00:00 AM
Room: Coronado M&N
Session Chair: Daniel Franklin and Marta Carrara

ID: 7374
A Novel Multimodal Physiological Model for the Noninvasive and Continuous Measurements of Arterial Blood Pressure
Ting Xiang{2}, Yong Zhang{2}, Yuanting Zhang{1}
{1}Chinese University of Hong Kong, Hong Kong; {2}City University of Hong Kong, Hong Kong

ID: 7067
Machine Learning Algorithm to Estimate Cardiac Output Based on Less-Invasive Arterial Blood Pressure Measurements
Alan Hamo{1}, Niki Ottenhof{2}, Jan-Wiebe Korstanje{2}, Justin Dauwels{1}
{1}Delft University of Technology, Netherlands; {2}Erasmus University Medical Center, Netherlands

ID: 7951
Modeling the Frank-Starling Mechanism at the Cardiac Muscle and Ventricle Levels
Joseph Palladino
Trinity College, United States

ID: 7267
A Feasibility Study on the Response of Vascular Impedance to Reactive Hyperemia
Nimmi Sudarsan{2}, Rahul Manoj{2}, Raj Kiran V{2}, P. M. Nabeel{2}, Dinu S Chandran{1}, Jayaraj Joseph{2}
{1}All India Institute of Medical Sciences, India; {2}Indian Institute of Technology Madras, India

ID: 7221
An Efficient Framework for Solving a Convex, State-Space Heartbeat Dynamics Model
Sabrina Liu, Andrew Perley, Todd Coleman
Stanford University, United States

ID: 6675
Prediction of the Duration of Maximal Exercise Test in Professional Adolescent Football Players Based on the Cardiorespiratory Signals – A Pilot Study
Maciej Rosol{4}, Jakub Gąsior{1}, Kacper Korzeniewski{4}, Jonasz Łaba{3}, Robert Makuch{2}, Marcel Młyńczak{4}
{1}Medical University of Warsaw, Poland; {2}Pulaski University of Technology and Humanities, Poland; {3}Warsaw University of Technology, Poland; {4}Warsaw University of Technology, OASIS Diagnostics, Poland
Surgical Robotics
8:30:00 AM - 10:00:00 AM
Room: Durango 2
Session Chair: Jaydev Desai and Satoshi Miura

ID: 6248
MTPA-Based Haptic Feedback Controller for Master Manipulator of Minimally Invasive Surgery
Wenda Zhao{1}, Jian Chen{2}, Yilun Hong{1}, Hongbin Liu{1}
{1}Institute of Automation, Chinese Academy of Sciences, China; {2}University of Chinese Academy of Sciences, Hong Kong Institute of Science and Innovation, CAS, China

ID: 6191
Enhanced Guidance for Endovascular Robotics
Dennis Kundrat{1}, Alfred Schell{2}, Jelle Bijlsma{2}, Giulio Dagnino{2}
{1}Fraunhofer Research Institution for Individualized and Cell-Based Medical Engineering IMTE, Germany; {2}University of Twente, Netherlands

ID: 6585
Selective Clamping for Robot-Assisted Surgical Procedures
Gabriele Furnari, Marco Minelli, Stefano Puliatti, Salvatore Micali, Cristian Secchi, Federica Ferraguti
Università degli Studi di Modena e Reggio Emilia, Italy

ID: 7651
A Robotic Injection System for Consistent Pneumo-Dissection of the Deep Stroma in Big Bubble DALK Surgery
James Kaluna{1}, Justin Opfermann{1}, Yaning Wang{1}, Jin Kang{1}, William Gensheimer{2}, Axel Krieger{1}
{1}Johns Hopkins University, United States; {2}White River Junction VA Medical Center, United States

ID: 7668
Bedside Admittance Control of a Dual-Segment Soft Robot for Catheter-Based Interventions
{1}Children’s National Hospital, United States; {2}Johns Hopkins University, United States; {3}University of Maryland, Baltimore, United States; {4}University of Maryland, College Park, United States

ID: 7720
A Feasible Workflow for Retinal Vein Cannulation in Ex Vivo Porcine Eyes with Robotic Assistance
Peiyao Zhang{1}, Peter Gehlbach{2}, Marin Kobilarov{1}, Iulian Iordachita{1}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States
Technical Program – Tuesday, July 16th

Recent Advances in Bioimpedance As a Tool for the Assessment of Muscle Condition
8:30:00 AM - 10:00:00 AM
Room: Monterrey 2&3

In developed nations, demographic change is anticipated to influence society and economics in the coming decades. In particular, such aging societies must deal with age-related tissue variations and neuromuscular diseases, most likely challenging the boundaries of the current health care system. Often applied manual diagnosis and therapy monitoring, which is demanding for both patient and therapist, must be replaced with promising alternatives that provide more muscle specificity to address age-related tissue variations, such as Sarcopenia. Recently, Electrical Impedance Myography (EIM), or more specifically bioimpedance measurements of the muscle, has gained interest in the scientific community. However, the standardization of the applied electrode array, the definition of feasible test protocols, and the interpretation of the acquired EIM measurements are still topics of research. In the future, EIM may address questions about residual muscle activity, muscular force development, and the patient’s intention of motion. The participants of this workshop aim to take a first step toward capturing the current state of knowledge about Bioimpedance as a tool for muscle assessment and addressing the challenges this approach is currently facing. Thus, shaping the pathway towards consensus to establish EIM as a new tool for muscle assessment.

Organizers: Steffen Leonhardt\{3\}, Todd Freeborn\{4\}, Seward Rutkove\{2\}, Alfred Hülkenberg\{3\}, Pan Xu\{1\}
\{1\}Fuzhou University, College of Physics and Information Engineering, China; \{2\}Harvard Medical School, Department of Neurology, United States; \{3\}RWTH Aachen University, Helmholtz Institute, Chair for Medical Information Technology, Germany; \{4\}The University of Alabama, Department of Electrical and Computer Engineering, United States

Opening Ceremony
10:00:00 AM - 11:30:00 AM
Room: Coronado H-J

Plenary Presentation – Transforming our World with Bioengineering for a Better Tomorrow
11:30:00 AM - 12:30:00 PM
Room: Coronado H-J

Dr. Susan S. Margulies leads the U.S. National Science Foundation’s Directorate for Engineering in its mission to transform our world for a better tomorrow by driving discovery, inspiring innovation, enriching education, and accelerating access. The NSF’s Engineering Directorate provides over 40 percent of federal funding for fundamental research in engineering at academic institutions, leading to innovative technologies and sustainable impacts in health, agriculture, clean energy and water, resilient infrastructure, advanced manufacturing and communication systems, and many other areas. NSF support also builds the Nation’s workforce capacity in engineering and supports the diversity and inclusion of engineers at all career stages. Projects span frontier research to generate new knowledge, problem-driven research to identify new solutions to societal challenges, and application-driven research to translate discoveries to uses that enhance prosperity, equity and quality of life for all Americans.

Margulies joined the NSF as the assistant director for the Directorate for Engineering in August 2021 after leading the Wallace H. Coulter Department of Biomedical Engineering at the Georgia Institute of Technology and Emory University. While on detail at the NSF, she is a professor and Georgia
Technical Program – Tuesday, July 16th

Research Alliance Eminent Scholar at Georgia Tech and Emory. Margulies is internationally recognized for pioneering studies to identify mechanisms underlying brain injuries in children and adolescents and lung injuries associated with mechanical ventilation, leading to improved injury prevention, diagnosis and treatments.

Margulies’ transdisciplinary scholarly impact has been recognized by her election as fellow of the American Society of Mechanical Engineers, the Biomedical Engineering Society, and the American Institute for Medical and Biological Engineering, and as a member of the American Academy of Arts and Sciences, the National Academy of Engineering and the National Academy of Medicine.

**WBSS TC Meeting (Invitation ONLY)**
12:00:00 PM - 1:00:00 PM  
*Room: Sierra 1*

**Theme 7 Keynote - The Revolution in Personal Cardiac Diagnostic Technology**
12:30:00 PM - 1:30:00 PM  
*Room: Coronado H-J*

David E. Albert, MD is a physician, inventor and serial entrepreneur who has developed medical technologies and products over the last 40 years, turning a number of those innovations into tech startups. He is a founder and Chief Medical Officer of AliveCor. His previous startups include Corazonix Corp (sold to Arrhythmia Research Technology) and Data Critical (sold to GE). He invented the AliveCor® KardiaMobile™ in 2010 and it immediately became a global sensation via a four-minute YouTube Video in January 2011. Dr. Albert has 81 issued US patents. He has authored or co-authored over 100 scientific abstracts and publications principally in the Cardiology literature. Dr. Albert has lectured at universities and leading medical centers all over the world as well as being a regular faculty member at the major Cardiology Scientific Meetings (AHA, ACC, HRS, TCT). Dr. Albert graduated with Honors from Harvard College and from Duke University Medical School. Dr. Albert currently lives in Los Angeles with his wife. They have four children and two granddaughters.

**Students and Young Professionals: Networking Lunch (Tuesday)**
12:30:00 PM - 2:30:00 PM  
*Room: Coronado K*

**BSP TC Committee Meeting (Invitation ONLY)**
1:00:00 PM - 2:00:00 PM  
*Room: Sierra 1*

**TST TC Committee Meeting (Invitation ONLY)**
2:00:00 PM - 3:00:00 PM  
*Room: Sierra 1*
### Efforts from IEEE Standards Association in Improving Data Quality of Electronic Health Records

2:00:00 PM - 3:30:00 PM  
*Room: Baja*

The mini symposium will provide insights to the audience on efforts made by IEEE Standards Association to develop guidelines for improving data quality associated with electronic health records. The symposium will include speakers from the industry and academia who are involved in this effort. The speakers will provide key insights to the existing problems associated with quality of data contained in electronic health record systems and on how their association with the IEEE Standards Industry Connect workgroup has helped them understand this problem and the importance of mitigating it. Overall, the purpose of the symposium is to highlight efforts made by IEEE to address some of the key issues in this problem domain.

**Organizer:** Varadraj Gurupur  
University of Central Florida, United States

### Bridging the Gender Gap in Healthcare Research & Innovation: Digital Technologies for Women’s Health

2:00:00 PM - 3:30:00 PM  
*Room: Fiesta 5&6*

Our mini-symposium brings together thought leaders, researchers, and practitioners from academia, industry, and global governance, to explore how digital technologies can address gender disparities in healthcare research, with a special focus on women’s health. We aim to foster interdisciplinary collaboration, catalyze advancements in digital health solutions for women, and generate actionable insights for researchers, practitioners, and policymakers. The symposium will include talks and a panel discussion by Dr. Aarti Sathyanarayana an Assistant Professor at Northeastern University and an expert in digital phenotyping and signal processing of ubiquitous devices; Dr. Jyotishman Pathak, a Professor at Weill Cornell Medical College and an expert in social determinants of mental health; Dr. David Novillo-Ortiz, the unit head of digital data at the World Health Organization; Dr. Sy Kyung Kim, an Assistant Professor at Thomas Jefferson University and an expert in mHealth interventions for economically disadvantaged women; and Emily Capodulipo, the Senior Vice President of Data Science and Research at WHOOP. The diverse perspectives of the speakers promise a comprehensive exploration of how technology can contribute to gender equity in healthcare research and innovation. Our expected outcomes include (i) generating increased awareness of gender disparities introduced by digital health technologies, (ii) fostering new collaboration across interdisciplinary and international teams, (iii) showcasing innovation with the potential to transform women’s healthcare, and (iv) formulating policy recommendations aimed at promoting gender-inclusive healthcare. Our symposium aspires to contribute to this year’s conference theme of “Technology's promise for equity and access for well-health” by showcasing cutting-edge research and innovations that address the unique healthcare challenges faced by women, making significant strides toward a more inclusive and equitable healthcare future.

**Organizers:** Aarti Sathyanarayana{1}, Jyotishman Pathak{3}, Emily Capodilupo{4}, David Novillo-Ortiz{5}, Su Kyung Kim{2}  
{1}Northeastern University, United States; {2}Thomas Jefferson University, United States; {3}Weill Cornell Medical College, United States; {4}WHOOP, Inc., United States; {5}World Health Organization, Denmark
The mini-symposium on “Equitable Digital Technology in Cardio-Respiratory Engineering” seeks to explore the intersection of cutting-edge artificial intelligence (AI) and assistive technology to address pressing health challenges in the cardiovascular and respiratory disease management. This interdisciplinary event brings together experts from AI, health informatics, rehabilitation engineering, and clinical practice to advance the development of inclusive and equitable technological solutions. The symposium will delve into innovative methods for collecting and interpreting health data, crucial for fostering independent living and effective management of cardiovascular and respiratory conditions. As chronic conditions like sleep apnea, heart failure increasingly affect global populations, our discussions will extend to the implications of heart failure and sleep apnea. The symposium aims to shed light on the technologies that has been developed and implemented in heart failure and sleep apnea management. Attendees will gain insights into the latest algorithms and technologies that inform diagnostic and therapeutic approaches, striving for a shift towards personalized and accessible healthcare. This session promises to offer a collaborative platform for sharing transformative ideas, fostering equitable digital solutions in cardiorespiratory health, and setting a precedent for future innovation in the field.

Organizers: Azadeh Yadollahi, Shumit Saha
University Health Network, Canada
**Theme 6 Keynote - Behaviorally Reinforced Generative Spike Prediction Model: Towards the Rewiring of Disconnected Brain Areas**  
2:00:00 PM - 3:00:00 PM  
*Room: Coronado H-J*

Yiwen Wang received B.S. and M.S. degrees from University of Science and Technology of China (USTC), Hefei, Anhui, China respectively. She received a Ph.D. degree from University of Florida, Gainesville, FL, USA. She joined as an associate professor at Zhejiang University, Hangzhou, China. She is now an associate professor with substantiation at the Department of Electronic and Computer Engineering, Department of Chemical and Biological Engineering, the Hong Kong University of Science and Technology.

Her research interests are in neural decoding of brain-machine interfaces, adaptive signal processing, computational neuroscience, and neuromorphic engineering. She served as the Chair of the IEEE EMBS Neural Engineering Tech Committee, the Chair of the IEEE BRAIN publication subcommittee, and the board member of Brain Computer Interfaces Society. She was the Editor-in-Chief of the IEEE Brain Newsletter. She also serves on the editorial board of the Journal of Neural Engineering, an associate editor of the IEEE Transactions on Neural Systems and Rehabilitation Engineering, and was the associate editor of Frontiers in Human Neuroscience (Brain-Computer Interfaces), associate editor of the IEEE Transactions on Cognitive and Developmental Engineering. She was recognized as IEEE EMBS distinguished lecturer in 2022, and received IEEE EMBS Distinguished Service award in 2023. She holds two US patents and has authored more than 100 peer-reviewed publications.

**Activity, Gait, and Postures 2**  
2:00:00 PM - 3:30:00 PM  
*Room: Monterrey 1*  
Session Chair: Manuel Hernandez and Sandra Hnat

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<th>ID</th>
<th>Title</th>
<th>Authors</th>
<th>Institution</th>
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<td>6699</td>
<td>Enhanced In-Home Human Activity Recognition Using Multimodal Sensing and Spatiotemporal Machine Learning Architecture</td>
<td>Seyyed Mahdi Torabi, Mohammad Narimani, Edward J. Park</td>
<td>Simon Fraser University, Canada</td>
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<td>6721</td>
<td>Assessing the Impact of IMU Sensor Location on Spatio-Temporal Gait Parameter Estimation</td>
<td>Keehong Seo, Joonyoung Jung, Jungsik Hwang, Kyungrock Kim, Sang-Hun Kim</td>
<td>Samsung Research, Korea</td>
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<td>6855</td>
<td>In-Sensor Movement Variability Tracking</td>
<td>Swapnil Sayan Saha, Krishna Chaitanya Palle, Mahesh Chowdhary</td>
<td>STMicroelectronics Inc., United States</td>
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<td>7088</td>
<td>Smartphone-Based Balance Assessment Using Machine Learning</td>
<td>Marjan Nassajpour{1}, Mustafa Shuqair{1}, Amie Rosenfeld{2}, Magdalena Ioana Tolea{2}, James E Galvin{2}, Behnaz Ghoraani{1}</td>
<td>{1}Florida Atlantic University, United States; {2}University of Miami, United States</td>
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ID: 7194
Towards Early Detection of Chronic Kidney Disease Based on Gait Patterns: IMU-Based Approach Using Neural Networks
Sunghan Lee{2}, Jeonghwan Koh{2}, Gyeongbong Kim{2}, Seok-Jue Jeong{2}, Youngjin Song{1}, Moo-Eob Ahn{1}, Hyunsuk Kim{1}, In Cheol Jeong{2}
{1}Chuncheon Sacred Heart Hospital, Korea; {2}Hallym University, Korea

ID: 8052
Human Motion Intention Recognition with Thigh Mounted IMUs
Stella Ansah, Se Young Yoon, Diliang Chen
University of New Hampshire, United States

Analysis of Cancer Imaging Data
2:00:00 PM - 3:30:00 PM
Room: Yucatan 1
Session Chair: Maksym Gaiduk and Recep Avci

ID: 6043
Ensuring Model Fairness via Stratified Training: TP53 Mutation Prediction with Estrogen Receptor Stratification in Breast Histopathology
{1}FORTH-ICS-CBML, Greece; {2}Karolinska Institute, Sweden

ID: 6803
STFormer: Learning to Explore Spot Relationships for Spatial Transcriptomics Prediction from Histology of Colorectal Cancer
Gan Zhan{1}, Xiuxu Du{2}, Jing Liu{2}, Yinhao Li{1}, Lanfen Lin{3}, Jingsong Li{2}, Yen-Wei Chen{1}
{1}Ritsumeikan University, Japan; {2}Zhejiang Lab, China; {3}Zhejiang University, China

ID: 7282
Anatomical Concept-Based Pseudo-Labels for Increased Generalizability in Breast Cancer Multi-Center Data
Isabela Miranda{1}, Georgios Agrotis{4}, Regina Beets-Tan{3}, Luis Teixeira{2}, Wilson Silva{5}
{1}INESC TEC, Portugal; {2}INESC TEC, Universidade do Porto, Portugal; {3}Netherlands Cancer Institute, Netherlands; {4}University Hospital of Larissa, Greece; {5}Utrecht University, Netherlands

ID: 7700
Understanding Bias in Multispectral Autofluorescence Lifetime Imaging: Are Models Sensitive to Oral Location?
Kayla Caughlin{3}, Rodrigo Cuenca Martinez{1}, Gabriel Tortorelli{1}, Kathleen Higgins{2}, Ronald Faram{2}, Javier Jo{1}, Carlos Busso{3}
{1}University of Oklahoma, United States; {2}University of Oklahoma Health Sciences Center, United States; {3}University of Texas at Dallas, United States
Technical Program – Tuesday, July 16th

ID: 7703
**A CNN-GNN Approach for Polarity Vectors Prediction in 3D Microscopy Images**
Diogo Moura{2}, Hemaxi Narotamo{1}, Margarida Silveira{1}
{1}ISR/IST, Universidade de Lisboa, Portugal; {2}IST/IST, Universidade de Lisboa, Portugal

ID: 7934
**Contrastive Pre-Training and Multiple Instance Learning for Predicting Tumor Microsatellite Instability**
Ronald Nap, Mohammed Aburidi, Roummel Marcia
University of California, Merced, United States

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**Cardiovascular Systems Modeling**
2:00:00 PM - 3:30:00 PM
*Room: Coronado F&G*
Session Chair: Joseph Palladino and Ramakrishna Mukkamala

ID: 6301
**Estimating Aortic Pressure Waveform in a 1D Hemodynamic Model of the Human Arterial System Using DeepONet**
Junki Hong, Changhee Min, Bomi Lee, Adelle Ria Persad, Jae-Hak Jeong, Yong-Hwa Park
Korea Advanced Institute of Science and Technology, Korea

ID: 7923
**Identifying When Steady-State Flow Simulations in Patient-Specific Coronaries Recapitulate Pulsatile Flow Dynamics**
Maximilian Huber, Juliet Jiang, Cyrus Tanade, Amanda Randles
Duke University, United States

ID: 6334
**Understanding Acoustic Phenomena in Stenosed Coronary Arteries Through Bond Graph Modeling of Sound Generation**
{1}Universidad de Concepción, Chile; {2}University of Brasilia, Brazil; {3}University of Concepcion, Chile

ID: 6401
**A Mathematical Pulmonary Model for Heart-Lung Interactions During Mechanical Ventilation**
Carlotta Hennigs{2}, Mirja Noethlich{2}, Franziska Bilda{2}, Philipp Rostalski{1}
{1}Fraunhofer Research Institution for Individualized and Cell-Based Medical Engineering IMTE, Germany; {2}Universität zu Lübeck, Germany

ID: 7011
**Central Blood Pressure Estimation from Radial Artery in Septic Shock**
Manuela Ferrario, Diletta Guberti, Marta Carrara
Politecnico di Milano, Italy
Technical Program – Tuesday, July 16th

ID: 7055
**Blood Flow Estimation from Invasive Arterial Blood Pressure: A Black-Box Approach**
Diletta Guberti, Marta Carrara, Manuela Ferrario
Politecnico di Milano, Italy

ID: 6930
**Extraction of Patients Subpopulations with Psychiatric Symptoms Using a Transformer Architecture**
Benjamin Holmes, Michael Raymer, Tanvi Banerjee
Wright State University, United States

ID: 6488
**Evaluating LLMs for Diagnosis Summarization**
Joaquim Santos{1}, Henrique D. P. Santos{1}, Ana Helena D. P. S. Ulbrich{1}, Daniela Faccio{1}, Fábio de O. Tabalipa{3}, Rodrigo F. Nogueira{2}, Manuela Martins Costa{4}
{1}Institute of A.I. in Healthcare, Brazil; {2}Maritaca AI, Brazil; {3}MeMed, Brazil; {4}PPGEpi-Universidad Federal de Rio Grande del Sur, Brazil

ID: 6922
**A Regression Framework for Predicting Cognitive Decline in Frontotemporal Dementia Using Recurrent Neural Networks**
Km Poonam, Rajlakshmi Guha, Partha P Chakrabarti
Indian Institute of Technology Kharagpur, India

ID: 6966
**Artificial Intelligence Based Hierarchical Classification of Frontotemporal Dementia**
Km Poonam, Rajlakshmi Guha, Partha P Chakrabarti
Indian Institute of Technology Kharagpur, India

ID: 7170
**Interactive Explainable Deep Survival Analysis**
Lu Wang{1}, Xinyu Qin{1}, Jingyan Jiang{1}, Yan Li{2}, Winston Liaw{1}
{1}University of Houston, United States; {2}University of Toronto, Canada

ID: 7604
**LLM-Based Kidney Disease Diagnostic Framework for Pathologists**
Masooma Zehra Syeda{3}, Syed Usama Khalid Bukhari{1}, Maqbool Hussain{3}, Wajahat Ali Khan{3}, Syed Sajid Hussain Shah{2}
{1}Idrak AI Ltd., United Kingdom; {2}Northern Border University, Saudi Arabia; {3}University of Derby, United Kingdom
Technical Program – Tuesday, July 16th

Gait Biomechanics & Control
2:00:00 PM - 3:30:00 PM
Room: Durango 2
Session Chair: Anselmo Frizera Neto and Jerzy Sawicki

ID: 6500
Walking Speed and Uncertainty Estimation Using Mixture Density Networks for Dynamic Ambulatory Environments
Jewoo Lee{2}, Bokman Lim{2}, Sungjoon Choi{1}
{1}Korea University, Korea; {2}WIRobotics, Korea

ID: 6625
Age- and Sex-Related Differences in Muscle Mechanics and Gait Biomechanics During Incline Walking
Yujin Kwon, Yunbeom Nam, Gwanseob Shin
Ulsan National Institute of Science and Technology, Korea

ID: 7115
Walking Mode-Depending Improvements of Locomotion Detection Through Rejection Based Post-Processing
Fabian Just{1}, Bahareh Ahkami{1}, Max Ortiz-Catalan{2}
{1}Chalmers University of Technology, Sweden; {2}University of Melbourne, Australia

ID: 6997
Automation of User Pace-Adjusted Treadmill: Comparison of Control Methods Based on LRF Sensors
Brayan Moreno{2}, Ricardo Mello{2}, Anselmo Frizera{1}
{1}Federal University of Espirito Santo, Brazil; {2}Universidade Federal do Espírito Santo, Brazil

ID: 7106
Experimental Evaluation of Machine Learning Models for Gait Segmentation
Jacob Strick{1}, Jason Wiebrecht{1}, Ryan Farris{2}, Jerzy Sawicki{1}
{1}Cleveland State University, United States; {2}Messiah University, United States

ID: 7457
Covariate Analysis for Footstep Recognition Using Unsupervised Hierarchical Clustering
Neha Kulkarni, Robyn Larracy, Angkoon Phinyomark, Erik Scheme
University of New Brunswick, Canada

Imaging Technology
2:00:00 PM - 3:30:00 PM
Room: Fiesta 3&4
Session Chair: Lejla Alic and Rana Raza Mehdi

ID: 6265
Efficient Kidney Tumor Classification and Segmentation with U-Net
Varalakshmi P, Tilak Soorya R, Anugeeta S, Akshaya S
Anna University, India
ID: 6489
**Automating Cobb Angle Measurement for Adolescent Idiopathic Scoliosis Using Instance Segmentation**
Chaojun Chen, Khashayar Namdar, Yujie Wu, Shahob Hosseinpour, Manohar Shroff, Andrea Doria, Farzad Khalvati
University of Toronto, Canada

ID: 6756
**An Improved Passive Shimming Design Method for Superconducting MRI Based on Distribution Density**
Yufu Zhou{2}, Yuchong Xie{1}, Huiyu Du{1}, Qing Zhang{1}, Bensheng Qiu{1}
{1}University of Science and Technology of China, China; {2}University of Science and Technology of China, Fuqing Medical Co., Ltd., China

ID: 7134
**Tissue Clearing and 3D Imaging of Gap Junctions in Rat Uterine Myometrium**
Amy Garrett, Benjamin Prince, Gregory Sands, Leo Cheng, Alys Clark
University of Auckland, New Zealand

ID: 7584
**Spine Vision – X-Ray Image Based GUI Planning of Pedicle Screws Using Enhanced YOLOv5 for Vertebrae Segmentation**
Yaswantha Rao Paragada, Gaurisankar S, Durga R, Aparna Purayath, Vivek Maik, Manojkumar Lakshmanan, Mohanasankar Sivaprakasam
Indian Institute of Technology Madras, India

ID: 7902
**Path-Based Differential Analysis in Near-Centenarians and Centenarians Brain Network**
Haleh Falakshahi, Hooman Rokham, Vince D. Calhoun
TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States

**MRI Image Reconstruction**
2:00:00 PM - 3:30:00 PM
Room: Yucatan 2
Session Chair: Ethan Murphy and

ID: 7205
**A Fast Patch-Based Hankel Low-Rank Method for Magnetic Resonance Spectroscopy Reconstruction**
Hengfa Lu{2}, Xinlin Zhang{1}
{1}Fuzhou University, China; {2}University of Texas at Austin, United States

ID: 6161
**Instance-Wise MRI Reconstruction Based on Self-Supervised Implicit Neural Representation**
Songxiao Yang, Yizhou Li, Masatoshi Okutomi
Tokyo Institute of Technology, Japan
ID: 6278
Multi Echo-Time ASL MRI Denoising via Joint Complex Low-Rank Regularization  
Hangfan Liu{2}, Bo Li{2}, Yiran Li{2}, Manuel Taso{1}, John Detre{3}, Ze Wang{2}  
{1}Siemens Healthineers, United States; {2}University of Maryland, Baltimore, United States;  
{3}University of Pennsylvania, United States

ID: 6598
Intelligent Agent Planning for Optimizing Parallel MRI Reconstruction via a Large Language Model  
Yuchou Chang{3}, Zhiqiang Li{1}, Huy Anh Pham{2}, Gulfam Ahmed Saju{3}  
{1}Barrow Neurological Institute, United States; {2}Intelligent Medical Objects, Inc., United States;  
{3}University of Massachusetts Dartmouth, United States

ID: 7358
Self-Supervised MR Image Reconstruction from Single Measurement  
Chong Li{3}, Ye Liu{1}, Dong Liang{5}, Caiying Wu{2}, Jing Cheng{4}  
{1}Chinese Academy of Sciences, ShanghaiTech University, China; {2}Inner Mongolia University, China;  
{3}Inner Mongolia University, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China;  
{4}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China;  
{5}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, ShanghaiTech University, China

ID: 6766
Ensemble CycleGAN for Retrospective Rigid Motion Correction in MRI  
Gulfam Ahmed Saju, Marjan Akhi, Yuchou Chang  
University of Massachusetts Dartmouth, United States

Sensing for Electrical Activity  
2:00:00 PM - 3:30:00 PM  
Room: Fiesta 7&8  
Session Chair: Sanghoon Lee and Wen Qi

ID: 6717
A Multi-Channel Eye-Mask-Based Wearable System for Accurate Eye Movement Recognition  
and Saccadic Angle Estimation  
Zheng Zeng{3}, Linkai Tao{2}, Ligang Zhou{3}, Xia Hu{3}, Wei Yuan{1}, Chen Chen{3}, Wei Chen{4}  
{1}Chinese Academy of Sciences, China; {2}Eindhoven University of Technology, Netherlands;  
{3}Fudan University, China; {4}University of Sydney, Australia

ID: 7068
TinyML for Real-Time Embedded HD-EMG Hand Gesture Recognition with On-Device Fine-Tuning  
Étienne Buteau{2}, Gabriel Gagné{2}, William Bonilla{2}, Mounir Boukadoum{1}, Paul Fortier{2},  
Benoit Gosselin{2}  
{1}Université du Québec à Montréal, Canada; {2}Université Laval, Canada
Technical Program – Tuesday, July 16th

ID: 7370
**A Capacitorless, AC-Coupled, Monolithic Input-Stage Optimized for Multi-Channel Surface EMG Acquisition**
Simos Koutsoftidis, Yacine Belgaid, Guang Yang, Deren Y Barsakcioglu, Konstantinos N Glaros, Dario Farina, Emmanuel M Drakakis
*Imperial College London, United Kingdom*

ID: 7380
**Eye-Tracking in Mixed Reality for Diagnosis of Neurodegenerative Diseases**
Mateusz Daniol{1}, Daria Hemmerling{1}, Jakub Sikora{1}, Pawel Jemiolo{1}, Marek Wodzinski{2}, Magdalena Wojcik-Pedziwiatr{3}
{1}AGH University of Krakow, Poland; {2}AGH University of Krakow, University of Applied Sciences Western Switzerland, Poland; {3}Andrzej Frycz Modrzewski Krakow University, Poland

ID: 7518
**Label-Free Classification of L-Histidine Vs Artificial Human Sweat Using Laser Scribed Electrodes and a Multi-Layer Perceptron Neural Network**
William García-Rodríguez, Andrés Saavedra-Ruiz, Pedro J. Resto-Irizarry
*University of Puerto Rico, Mayagüez, United States*

ID: 7957
**Visual Scene Understanding for Enhanced EMG Gesture Recognition**
Félix Chamberland{1}, Thomas Labbé{1}, Simon Tam{1}, Erik Scheme{2}, Benoit Gosselin{1}
{1}Université Laval, Canada; {2}University of New Brunswick, Canada

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**Signal Processing & Classification for Contactless Systems**
2:00:00 PM - 3:30:00 PM
*Room: Coronado M&N*
Session Chair: Riccardo Barbieri and Georgios Mitsis

ID: 7479
**Non-Contact Heart Rate and Respiratory Rate Estimation from Videos of the Neck**
Tianyu Zhang{2}, Miodrag Bolic{2}, Mohamad Hosein Davoodabadi Farahani{2}, Terri Zadorsky{1}, Roland Sabbagh{1}
{1}Orleans Cardiopulmonary Group, Canada; {2}University of Ottawa, Canada

ID: 6257
**Camera-Position-Robust Drowsiness Estimation Based on Rotated-Facial-Video Augmentation**
Masanori Tsujikawa{2}, May PhyoKhaing{1}
{1}Human Resocia Co., Ltd., Japan; {2}NEC Corporation, Japan

ID: 6971
**PhysioSens1D-NET: A 1D Convolution Network for Extracting Heart Rate from Facial Videos**
Aravind A Anil, Srinivasa Karthik, Mohanasankar Sivaprakasam, Jayaraj Joseph
*Indian Institute of Technology Madras, India*
ID: 7025
**Deep Learning-Based Open-Set Person Identification Using Radar Extracted Cardiac Signals**
Zelin Xing, Mondher Bouazizi, Tomoaki Ohtsuki
Keio University, Japan

ID: 6973
**Detection of Sleep Apnea-Hypopnea Events Using Millimeter-Wave Radar and Pulse Oximeter**
Wei Wang{3}, Chenyang Li{2}, Zhaoxi Chen{1}, Wenyu Zhang{1}, Zetao Wang{1}, Xi Guo{3}, Jian Guan{2}, Gang Li{3}
{1}Beijing Qinglei Technology Co. Ltd., China; {2}Shanghai Jiao Tong University School of Medicine Affiliated Sixth People’s Hospital, China; {3}Tsinghua University, China

ID: 6223
**Exploiting Dynamic Phase Information for Respiration Monitoring During Sleep via WiFi**
Hongyang Zhuo{2}, Tianyu Zhong{1}, Xianda Wu{2}, Baoxian Yu{2}, Shen Feng{2}, Qinghua Zhong{2}, Han Zhang{2}
{1}Nanyang Technological University, Singapore; {2}South China Normal University, China

**Systems Biology & Medicine**
2:00:00 PM - 3:30:00 PM
*Room: Fiesta 1&2*
*Session Chair: Zhihui Wang and Shaghayegh Abbasi*

ID: 6075
**Optimal Transport-Based Network Alignment: Graph Classification of Small Molecule Structure-Activity Relationships in Biology**
Mohammed Aburidi, Roummel Marcia
University of California, Merced, United States

ID: 8022
**Coupling In Silico and In Vitro Mechanistic Models to Define Vitamin D3 Immunomodulation of IL-12 and Nitric Oxide in Mycobacterium Tuberculosis Infection**
Azka Ahmed{2}, Maya Gough{1}, Taha Salim{1}, Elebeoba May{2}
{1}University of Houston, United States; {2}University of Wisconsin-Madison, United States

ID: 7294
**MIRROR: miRNA Regulation-Level Differential Network to Study Sex and Ethnic Disparities in Cancer**
Caterina Alfano{2}, Marco Filetti{1}, Lorenzo Farina{2}, Manuela Petti{2}
{1}Phase 1 Unit, Fondazione Policlinico Universitario A. Gemelli IRCCS, Italy; {2}Sapienza Università di Roma, Italy

ID: 7595
**Enzyme-Instructed Self-Assembly of Peptides Induced by Tyrosine Phosphatase in Breast Cancer Cells**
Emily Carney, Neda Habibi
University of North Texas, United States
Technical Program – Tuesday, July 16th

ID: 7349
**Patient Subtyping via Learning Hidden Markov Models from Pairwise Co-Occurrences in EHR Data**
Yawen Zhang, Yazhan Zhang, Haofei Wang
Pengcheng Laboratory, China

ID: 7516
**Predicting the Temporal Dynamics of Prosthetic Vision**
Yuchen Hou, Laya Pullela, Jiaxin Su, Sriya Aluru, Shivani Sista, Xiankun Lu, Michael Beyeler
University of California, Santa Barbara, United States

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**Therapeutic Devices & Systems 1**
2:00:00 PM - 3:30:00 PM
*Room: Coronado D&E*
Session Chair: Dorin Panescu and Byung Wook Park

ID: 6012
**Electrical Safety and Performance of E-Band Devices Relative to Relevant Requirements of International Electrical Standards**
Dorin Panescu
BIOTRONIK CRC EP, Inc., United States

ID: 6466
**Characterization of the Laser-Induced Thermal Outcome of Gold Nanorods-Mediated Photothermal Therapy in Breast Cancer Cells**
Leonardo Bianchi{2}, Sara Baroni{1}, Gabriela Paroni{1}, Martina Bruna Violatto{1}, Giulia Yuri Moscatiello{1}, Luca Russo{1}, Fabio Fiordaliso{1}, Laura Colombo{1}, Luisa Diomede{1}, Paolo Bigini{1}, Paola Saccomandi{2}
{1}Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Italy; {2}Politecnico di Milano, Italy

ID: 6704
**A Novel Direct Puncture Cannulation Blood Pump Support System: In Vivo Experimental Proof of Concept for a Therapeutic Approach with Cardiac Arrest**
Yasuyuki Shiraishi{2}, Francis Chikweto{2}, Hanako Suzuki{2}, Toshihiko Kijima{1}
{1}C&T Medical Lab., Japan; {2}Tohoku University, Japan

ID: 6926
**Effect of VER on Blood Flow Velocity in Intracranial Aneurysms Treated by Coil Embolization Using CFD**
Haruki Kanebayashi{2}, Soichiro Fujimura{2}, Kazunori Masuda{2}, Kostadin Karagiozov{1}, Hiroyuki Takao{1}, Toshihiro Ishibashi{1}, Yuichi Murayama{1}, Makoto Yamamoto{2}
{1}Jikei University, Japan; {2}Tokyo University of Science, Japan

ID: 7103
**High-Frequency Trans-Spinal Magnetic Stimulation for Chronic Neuropathic Pain Treatment**
Francesca Marturano{3}, Lidia Gomez-Cid{3}, Don Straney{3}, Iris Yin-Ching Chen{2}, Alice Marie Cécile Albrecht{1}, Xin Yu{3}, Ilknur Ay{2}, Giorgio Bonmassar{2}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Harvard Medical School, Massachusetts General Hospital, United States; {3}Massachusetts General Hospital, United States
Using Capability Maps Tailored to Arm Range of Motion in VR Exergames for Rehabilitation
Christian Lourido, Zaid Waghoo, Hassam Wazir, Nishtha Bhagat, Vikram Kapila
New York University, United States

Time-frequency Analysis of Biomedical Signals
2:00:00 PM - 3:30:00 PM
Room: Coronado P&Q
Session Chair: Alberto Porta and Justin Dauwels

Modal Decomposition Analysis of Corneal Dynamic Waveform During Air Puff Disturbance
Po-Jen Shih, Hsin-Haou Huang
National Taiwan University, Taiwan

Monitoring Chest Compression Rate in Cerebral Oximetry Signals During Cardiopulmonary Resuscitation Using Wavelet Analysis
Amaia Sanz-Pescador{2}, Erik Alonso{2}, Iraia Isasi{2}, Andima Larrea{1}, Ruth Salaberria{1}, Elisabete Aramendi{2}
{1}Basque Health Service, Spain; {2}University of the Basque Country, Spain

Decomposition Frequency Optimization in Wavelet-Based Template Matching Algorithms to Manage P300 Latency Jitter
Ilaria Quattrociocchi{2}, Valentina Caracci{2}, Angela Riccio{1}, Valentina Galiotta{1}, Mariagrazia D'Ippolito{1}, Febo Cincotti{3}, Jlenia Toppi{3}, Laura Astolfi{2}
{1}Fondazione Santa Lucia IRCCS, Italy; {2}Sapienza Università di Roma, Italy; {3}Sapienza Università di Roma, Fondazione Santa Lucia IRCCS, Italy

Cough Sound Based Deep Learning Models for Diagnosis of COVID-19 Using Statistical Features and Time-Frequency Spectrum
Jina Kim, Jinseok Lee
Kyung Hee University, Korea

Detection of Neurovascular Coupling in Full-Term Neonates Using Wavelet Coherence and Phase-Locking Value
Kaiyu Yu, Sean Mathieson, Andrew Flynn, Eugene Dempsey, Aisling Garvey, Geraldine Boylan, William Marnane, Gordon Lightbody
University College Cork, Ireland

EEG Spectral Power and Neurovascular Coupling as Early Predictors of Neurodevelopmental Outcome in Neonatal Hypoxic-Ishemic Encephalopathy
Srinivas Kota, Yu-Lun Liu, Lynn Bitar, Lina Chalak
University of Texas Southwestern Medical Center, United States
### Student Paper Competition #3
3:30:00 PM - 5:00:00 PM  
*Room: Cancun*

### TC Board Meeting (Invitation ONLY)
3:30:00 PM - 6:00:00 PM  
*Room: Sierra 1*

### Theme 9 Keynote - Accessible Infectious Diseases Testing: Lessons learned from COVID-19 in Upstate South Carolina
3:30:00 PM - 4:30:00 PM  
*Room: Coronado H-J*

Dr. Delphine Dean is the Ron and Jane Lindsay Family Innovation Professor and Chair of Bioengineering at Clemson University. Prior to joining Clemson in 2005, Dr. Dean earned her S.B., M.Eng., and Ph.D. in Electrical Engineering and Computer Science from MIT. She is focused on developing accessible healthcare solutions for underserved populations. Her research lab leads studies covering a wide range of areas from cardiovascular cell biomechanics, radiation biology, and medical device design. For over a decade, Dr. Dean has designing innovative medical devices tailored to low-resource environments. Her initiatives range from a cervical collar crafted from African grasses to a minimally invasive marker for breast cancer surgery patients. In response to the COVID-19 pandemic, Dr. Dean was part of a South Carolina wide initiative to create affordable and accessible saliva-based testing. She established the Research and Education in Disease Diagnostics and Intervention (REDDI) clinical diagnostic lab at Clemson, which conducted over 1.1 million COVID-19 tests for the university and the Upstate South Carolina community. The lab continues to expand its reach, now facilitating accessible clinical testing and educational opportunities for students.

### Chapter Chairs at EMBC (Invitation ONLY)
3:30:00 PM - 5:30:00 PM  
*Room: Yucatan 1*

### Theme 5 Keynote - Hypnos unveiled: Exploring Cardiovascular and Respiratory Variability During Sleep
4:30:00 PM - 5:30:00 PM  
*Room: Coronado H-J*

Dr. Michael Khoo is the Dean’s Professor of Biomedical Engineering and Pediatrics at the University of Southern California. He received his undergraduate and doctoral training from Imperial College (University of London) and Harvard University, respectively. He was Department Chair of Biomedical Engineering and Co-Director of Education and Outreach in the National Science Foundation Engineering Research Center on Biomimetic Microelectronic Systems from 2003 to 2010. He served as a member of EMBS AdCom, as Vice-President for Conferences, and as Chair of the 2012 EMBS International Conference. He is a Fellow of the IEEE, Biomedical Engineering Society, the American Institute of Medical and Biological Engineering, and the International Academy of Medical and Biological Engineering. He was the recipient of a NIH Research Career Development Award and an
American Lung Association Career Development Award. He is currently the Director of “SleepHuB”, a USC collaboratory that seeks to address important medical and societally relevant problems in sleep health with research approaches that deploy local resources, novel ideas and cutting-edge technological tools. His research focuses on developing dynamic computational models of the mechanisms underlying abnormal autonomic, metabolic and sleep regulation in chronic diseases, such as sleep-disordered breathing, hypertension, metabolic syndrome, and sickle cell disease.

Tuesday Refreshments
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

Tuesday Poster Session - Bionanotechnology
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 7012
Characterization of an In Vitro Model of Intestinal Cells as a Test-Bed for mCIPO Therapies
Lorenzo Corsello{4}, Simona Marra{4}, Adriana Saavedra{4}, Cristiana Picco{3}, Giulia Parodi{4}, Fabio Falleroni{2}, Paolo Gandullia{1}, Federica Viti{3}, Michela Chiappalone{4}
{1}IRCCS Ospedale Pediatrico Giannina Gaslini, Italy; {2}IRCCS Ospedale Policlinico San Martino, Italy; {3}National Research Council, Italy; {4}Università di Genova, Italy
Poster Board Number: 1

ID: 7192
Implantable Planar Micro-Coils for Ultra-Focal, Orientation-Specific Stimulation of Neurons
Yizhe Zhang{2}, Francesca Marturano{3}, Egemen Bostan{2}, Ilknur Ay{1}, Giorgio Bonmassar{1}, Jiangdong Deng{2}
{1}Harvard Medical School, Massachusetts General Hospital, United States; {2}Harvard University, United States; {3}Massachusetts General Hospital, United States
Poster Board Number: 2

ID: 7942
Optimizing Targeted Drug Delivery Through Hierarchical Network-Based Molecular Communication System
Haowen Tan{2}, Yue Sun{1}, Yifan Chen{2}
{1}Chengdu University of Technology, China; {2}University of Electronic Science and Technology of China, China
Poster Board Number: 3

Tuesday Poster Session - Cardiac & Vascular Mechanics
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6425
Investigating the Impact of a Gut Metabolite on Valvular Interstitial Cell Activation
Samanvitha Deepthi Sudi, Tanmayee Kolli, Ana Maria Porras
University of Florida, United States
Poster Board Number: 4
Technical Program – Tuesday, July 16th

ID: 6451
**Systemic Arterial Pressure-Volume Relationship and Vasomotor Tone: A One-Dimensional Viscoelastic Approach**
Leandro Javier Cymberknop{4}, Eugenia Ipar{4}, Jordi Alastruey{1}, Felipe Gabaldón Castillo{3}, Ricardo Luis Armentano{2}
{1}King’s College London, United Kingdom; {2}Universidad de la República CenUR Litoral Norte, Uruguay; {3}Universidad Politécnica de Madrid, Argentina; {4}UTN FRBA - Universidad Tecnológica Nacional, Argentina
Poster Board Number: 5

ID: 6563
**Custom Silicone Vessels for In Vitro Investigations on Vascular Ageing Using Photoplethysmography**
Parmis Karimpour, Redjan Ferizoli, James May, Panicos Kyriacou
City, University of London, United Kingdom
Poster Board Number: 6

ID: 7179
**Systematic Characterization and Automated Alignment of Coronary Tree Geometries**
Arash Ghorbannia, Amanda Randles
Duke University, United States
Poster Board Number: 7

ID: 7993
**Characterizing the Effect of Hold-Down Pressure for Local and Regional Stiffness Markers**
Smit Shah, Ganapathy Jaganathan, Rahul Manoj, Raj Kiran V, P. M. Nabeel, Jayaraj Joseph
Indian Institute of Technology Madras, India
Poster Board Number: 8

ID: 8038
**Does EDPVR Represent Myocardial Tissue Stiffness? Toward a Better Definition**
Rana Raza Mehdi{2}, Emilio A. Mendiola{2}, Vahid Naeni{2}, Gaurav Choudhary{1}, Reza Avazmohammadi{2}
{1}Brown University, United States; {2}Texas A&M University, United States
Poster Board Number: 9

**Tuesday Poster Session - Cardiorespiratory System Modeling**
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6082
**Influence of Sex, Age and Body Mass Index on an Algorithm for Electrocardiogram-Derived Respiratory Rate**
Ava Adli{1}, John H. Nichols{2}, Jesse D. Roberts Jr.{2}, Olivier Bernus{1}, Richard D. Walton{1}, Kanchan Kulkarni{1}
{1}IHU-Liryc, University of Bordeaux, France; {2}Massachusetts General Hospital, United States
Poster Board Number: 10
Technical Program – Tuesday, July 16th

ID: 6965
**Fusion of Ballistocardiography and Imaging for Improved Non-Contact Heart Rate Monitoring**
Clive Poppen, Nimal Jagadeesh Kumar, Srinivasa Karthik, Bhaskara Margana, Mohanasankar Sivaprakasam, Jayaraj Joseph
*Indian Institute of Technology Madras, India*
Poster Board Number: 11

ID: 7151
**How Do Age and Gender Affect the Respiratory Pattern in Healthy Subjects?**
Beatriz Giraldo Giraldo{5}, Ravneet Rahul Sandhu Singh{5}, Leon Balchin{5}, Daniel Romero Pérez{5}, Arantxa Mas Serra{2}, Manel Lujan Torné{4}, Melinda Popoviciu Koborzan{3}, Montserrat Martín-Baranera{1}, Jordi Solà-Soler{5}
{1}Bellvitge Biomedical Research Institute, Consorci Sanitari Integral, Spain; {2}Hospital de Sant Pau, Spain; {3}Intensive Care Service, Moisès Broggi Hospital, Spain; {4}Parc Taulí University Hospital, Autonomous University of Barcelona, Spain; {5}Technical University of Catalonia, Spain
Poster Board Number: 12

ID: 7338
**mSTEP: An Automated Algorithm for Blood Pressure Measurement from Korotkoff Sounds**
Arjun R Krishna, Raj Kiran V, P. M. Nabeel, Jayaraj Joseph
*Indian Institute of Technology Madras, India*
Poster Board Number: 13

ID: 7701
**Cardiorespiratory Phase Synchronization Analysis in Patients Undergoing Mechanical Ventilation During the Extubation Process**
Susana Velázquez Lerma{2}, Beatriz Giraldo Giraldo{2}, Salvador Benito Vales{1}, Jordi Solà-Soler{2}
{1}Hospital de Sant Pau, Spain; {2}Technical University of Catalonia, Spain
Poster Board Number: 14

ID: 8059
**Heart Murmur Classification for Diagnostic Applications**
Ashley FitzGerald, Taikang Ning
*Trinity College, United States*
Poster Board Number: 15

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**Tuesday Poster Session - Circulatory System Modeling**
4:30:00 PM - 6:00:00 PM
*Room: Veracruz Hall*

ID: 6434
**Optimizing Temporal Waveform Analysis: A Novel Pipeline for Efficient Characterization of Left Coronary Artery Velocity Profiles**
Justen Geddes, Amanda Randles
*Duke University, United States*
Poster Board Number: 16
Exploring Gender-Related Variations in Photoplethysmography
Sara Lombardi, Piergiorgio Francia, Leonardo Bocchi
Università degli Studi di Firenze, Italy
Poster Board Number: 17

Exploring Cardiopulmonary Interactions: A Novel Phase-Amplitude Coupling Method
Pengyan Tao{1}, Chien-Hung Yeh{1}, Weifeng Li{1}, Kaiwen Xu{2}, Wenbin Shi{1}
{1}Beijing Institute of Technology, China; {2}First Medical Center of PLA General Hospital, China
Poster Board Number: 18

On In-Silico Estimation of Left Ventricular End-Diastolic Pressure from Cardiac Strains
Emilio A. Mendiola{2}, Rana Raza Mehdi{2}, Dipan J. Shah{1}, Reza Avazmohammadi{2}
{1}Houston Methodist Research Institute, United States; {2}Texas A&M University, United States
Poster Board Number: 19

Physiological Control Algorithm for a Four Chamber Linear Motor Driven Mock Circulatory Model
Sai Susheel Praneeth Kode, Christopher Tan, Preston Peak, Oscar Howard Frazier, Yaxin Wang
Texas Heart Institute, United States
Poster Board Number: 20

Electrophysiological Changes in Simulated Atrial Sheets Due to Sympathetic Hyperactivity
Karl Magtibay{1}, Yusuf Abderrahman{1}, Stéphane Massé{2}, Kumaraswamy Nanthakumar{2}, Karthikeyan Umapathy{1}
{1}Toronto Metropolitan University, Canada; {2}University Health Network, Canada
Poster Board Number: 21

Recapitulating the Electrophysiological Features of In Vivo Biological Networks by Using a Real-Time Hardware Spiking Neural Network
Giuseppe De Venuto{2}, Romain Beaubois{3}, Sam Zahedi{2}, Marta Carè{1}, Jérémy Cheslet{3}, Federico Barban{2}, Mattia Di Florio{2}, Michela Chiappalone{2}, Timothée Levi{3}
{1}IRCCS Ospedale Policlinico San Martino, Italy; {2}Università di Genova, Italy; {3}University of Bordeaux, France
Poster Board Number: 22
ID: 7755
**Personalized Data-Driven State Models of the Circadian Dynamics in a Biometric Signal**
Chukwuemeka Ike{1}, Yunshi Wen{1}, John Wen{1}, Meeko Oishi{2}, Lee Brown{2}, Agung Julius{1}
{1}Rensselaer Polytechnic Institute, United States; {2}University of New Mexico, United States
Poster Board Number: 23

ID: 7894
**Evaluating the Effect of Fibre Parameters on Neural Simulations Computed Using ASCENT**
Zachary Nairac, Zack Bailey, Timothy Constandinou, Rylie Green
Imperial College London, United Kingdom
Poster Board Number: 24

ID: 7915
**The Updated ITAG Spinal Simulator (ISS) for Difficult Lumbar Punctures**
Robert Harutyunyan, Eric Pelletier, Sean Jeffries, Dan Hosi, Harsh Patel, Ehsan Ahmed, Yajiv Luckheenarain, Thomas Hemmerling
McGill University, Canada
Poster Board Number: 25

**Tuesday Poster Session - Connectivity & Causality**
4:30:00 PM - 6:00:00 PM
*Room: Veracruz Hall*

ID: 6604
**Neural Quantification of Emotion Influencing Learning Based on Dynamic Brain Network Analyses**
Donghao Yang, Chien-Hung Yeh, Wenbin Shi
Beijing Institute of Technology, China
Poster Board Number: 26

ID: 6861
**Diagnosis of Schizophrenia Using an Extended Multivariate Autoregressive Model for EEGs**
Ali Torabi, James Reilly, Duncan MacCrimmon
McMaster University, Canada
Poster Board Number: 27

ID: 6879
**Skin Sympathetic Nerve Activity Driver Extraction Through Non-Negative Sparse Decomposition**
Farnoush Baghestani, Youngsun Kong, Ki Chon
University of Connecticut, United States
Poster Board Number: 28

ID: 7183
**Investigation of the Effect of Physiological Artifacts on Task-Based Functional Connectivity: A Simulation Study**
Emad Askarinejad, Jean-Baptiste Poline, Georgios Mitsis
McGill University, Canada
Poster Board Number: 29
Technical Program – Tuesday, July 16th

ID: 7262
**Stochastic Graph Heat Modelling for Diffusion-Based Connectivity Retrieval**
Stephan Goerttler{2}, Fei He{2}, Min Wu{1}
{1}Agency for Science, Technology and Research, Singapore; {2}Coventry University, United Kingdom
Poster Board Number: 30

ID: 7464
**Inter-Modality Source Coupling: A Fully Automated Whole-Brain Data-Driven Structure-Function Fingerprint Shows Replicable Links to Reading in Large-Scale (N~8K) Analysis**
Aline Kotoski{2}, Robin Morris{1}, Vince D. Calhoun{3}
{1}Georgia State University, United States; {2}TReNDS Center, Georgia State University, United States; {3}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board Number: 31

ID: 7473
**Correlation Between EEG Functional Connectivity and Fasting Blood Glucose in Healthy Subjects**
Laura Päeske{2}, Hiie Hinrikus{2}, Jaanus Lass{2}, Toomas Põld{1}, Maie Bachmann{2}
{1}Meliva Medical Centre, Estonia; {2}Tallinn University of Technology, Estonia
Poster Board Number: 32

ID: 7561
**Investigating Cardiac Optical Signal Dynamics in Guinea Pigs Using Directed Information**
Hira Shahid{1}, Yuhang Xu{1}, Wing Tong{2}, Michael Taggart{2}, Dingchang Zheng{1}
{1}Coventry University, United Kingdom; {2}Newcastle University, United Kingdom
Poster Board Number: 33

ID: 7763
**Physiological Synchrony Analysis in a Multi-Person Setting: Unveiling Connections in Autism Family Therapy**
Rita Paulete{3}, Daniela Sousa{3}, Daniel Agostinho{3}, Joana Sequeira{2}, Marilyn Monteiro{1}, Miguel Castelo-Branco{3}, Marco Simões{3}
{1}Independent Consultant, United States; {2}Instituto Superior Miguel Torga, Portugal; {3}Universidade de Coimbra, Portugal
Poster Board Number: 34

**Tuesday Poster Session - Deep Learning in Medical Imaging**
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6008
**Automatic COVID-19 Detection from Chest X-Ray Using Deep MobileNet Convolutional Neural Network**
Noor Al-Qazzaz{2}, Alaa Aldoori{2}, Sawal Ali{1}, Siti Anom Ahmad{3}
{1}Universiti Kebangsaan Malaysia, Malaysia; {2}University of Baghdad, Iraq; {3}University of Putra Malaysia, Malaysia
Poster Board Number: 35
ID: 6249
**Data-Driven 3D Reconstruction for Electrical Impedance Tomography**
Jacob Thönes, Sascha Spors
Universität Rostock, Germany
Poster Board Number: 36

ID: 6296
**The Combine of GLCM and Group, Focuses on the Grayscale of Medical Images**
Zechen Zheng, Chao Fan, Congqian Wang, Miao Wang, Lizhi Zhang, Xuelei He, Xiaowei He
Northwest University, China
Poster Board Number: 37

ID: 6415
**Multimodal Dementia Screening from Brain Magnetic Resonance Imaging and Conversational Speech**
Kim Marie Lankenau{4}, Elisa Brauße{4}, Jana Schill{4}, Jochen G. Hirsch{2}, Johannes Schröder{3}, Matthias Günther{2}, Tanja Schultz{1}
{1}Cognitive Systems Lab, Universität Bremen, Germany; {2}Fraunhofer Institute for Digital Medicine MEVIS, Germany; {3}Ruprecht-Karls-Universität Heidelberg, Germany; {4}Universität Bremen, Germany
Poster Board Number: 38

ID: 7373
**Ensemble Distillation of Divergent Opinions for Robust Pathological Image Classification**
Kazuki Uehara{4}, Wataru Uegami{1}, Hirokazu Nosato{3}, Masahiro Murakawa{3}, Junya Fukuoka{2}, Hidenori Sakanashi{3}
{1}Kameda Medical Center, Japan; {2}Nagasaki University, Japan; {3}National Institute of Advanced Industrial Science and Technology, Japan; {4}University of the Ryukyus, Japan
Poster Board Number: 39

ID: 7625
**Domain Specific Transporter Framework to Detect Fractures in Ultrasound**
Arpan Tripathi{1}, Mahesh Panicker{1}, Jack Zhang{2}, Naveenjyote Boora{2}, Jacob L Jaremko{2}, Abhilash R. Hareendranathan{2}
{1}Indian Institute of Technology Palakkad, India; {2}University of Alberta, Canada
Poster Board Number: 40

**Tuesday Poster Session - Focus on AI methods**
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6068
**Characterization of Chronic Kidney Disease Progression in Patients with Diabetes via Group-Based Multi-Trajectory Modeling**
Alessandro Guazzo{2}, Enrico Longato{2}, Gian Paolo Fadini{2}, Giovanni Sparacino{2}, Rema Padman{1}, Barbara Di Camillo{2}
{1}Carnegie Mellon University, United States; {2}Università degli Studi di Padova, Italy
Poster Board Number: 41
Exploring Biomarker Relationships in Both Type 1 and Type 2 Diabetes Mellitus Through a Bayesian Network Analysis Approach
Yuyang Sun{1}, Jingyu Lei{2}, Panagiotis Kosmas{1}
{1}King’s College London, United Kingdom; {2}University College London, United Kingdom
Poster Board Number: 42

CoxFNN: Interpretable Machine Learning Method for Survival Analysis
Yufeng Zhang, Emily Wittrup, Kayvan Najarian
University of Michigan, United States
Poster Board Number: 43

Learning Physiological Mechanisms That Predict Adverse Cardiovascular Events in Intensive Care Patients with Chronic Heart Disease
Matthew Hodgman, Emily Wittrup, Kayvan Najarian
University of Michigan, United States
Poster Board Number: 44

Enhancing Medication Recommendation with Hierarchical Network and Patient Visit Histories
Sawrawit Chairat, Apichat Sae-Ang, Kerdkiat Suvirat, Thammasin Ingviya, Sitthichok Chaichulee
Prince of Songkla University, Thailand
Poster Board Number: 45

High Throughput Phenotyping of Physician Notes with Large Language and Hybrid NLP Models
Syed Munzir, Daniel Hier, Michael Carrithers
University of Illinois Chicago, United States
Poster Board Number: 46

Predictive Model Development to Identify Failed Healing in Patients After Non–Union Fracture Surgery
Cedric Doniè{2}, Marie Reumann{1}, Tony Hartung{1}, Benedikt Braun{1}, Tina Histing{1}, Satoshi Endo{2}, Sandra Hirche{2}
{1}Eberhard Karls Universität Tübingen, Germany; {2}Technische Universität München, Germany
Poster Board Number: 47

Exploring Self-Supervised Models for Depressive Disorder Detection: A Study on Speech Corpora
Bubai Maji, Shazia Nasreen, Rajlakshmi Guha, Aurobinda Routray, Debabrata Majumdar, Km Poonam
Indian Institute of Technology Kharagpur, India
Poster Board Number: 48
Technical Program – Tuesday, July 16th

ID: 7216

**The Diagnosis of Cardiovascular Disease Using Simple Blood Biomarkers Through AI and Big Data**

Vasileios Pezoulas{2}, Georg Ehret{1}, Kevin Dobretz{1}, Dimitrios I. Fotiadis{2}, Antonis Sakellarios{3}

{1}Universitaires de Genève, Switzerland; {2}University of Ioannina, FORTH-BRI, Greece; {3}University of Patras, University of Ioannina, FORTH-BRI, Greece

Poster Board Number: 49

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ID: 7302

**Enhanced Driver Stress Prediction from Multiple Biosignals via CNN Encoder-Decoder Model**

Vishal Singh Roha{2}, Maggie Ezzaat Gaber Gendy{2}, Kaveti Pavan{1}, Thomas M. Deserno{3}, Nagarajan Ganapathy{1}, Mehmet Yuce{2}

{1}Indian Institute of Technology Hyderabad, India; {2}Monash University, Australia; {3}Peter L. Reichertz Institute for Medical Informatics of TU Braunschweig and Hannover Medical School, Germany

Poster Board Number: 50

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ID: 7320

**A BERT Base Model for the Analysis of Electronic Health Records from Diabetic Patients**

Enrico Manzini{6}, Bogdan Vlacho{4}, Josep Franch-Nadal{2}, Joan Escudero{1}, Ana Génova{1}, Elisenda Reixach{3}, Erich Andrés{3}, Israel Pizarro{5}, Didac Mauricio{2}, Alexandre Perera-Lluna{6}

{1}Evidenze Health España, Spain; {2}Foundation University Institute for Primary Health Care Research Jordi Gol i Gurina, Spain; {3}Fundació TIC Salut Social, Spain; {4}Institut Universitari d’Investigació en Atenció Primària, Spain; {5}Novo Nordisck, Spain; {6}Universitat Politècnica de Catalunya, Spain

Poster Board Number: 51

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ID: 7463

**Interictal Epileptiform Discharge Detection Using Time-Frequency Analysis and Transfer Learning**

Munawara Munia{1}, Mohammdsaleh Hosseini{1}, Mehrdad Nourani{1}, Jay Harvey{2}

{1}University of Texas at Dallas, United States; {2}University of Texas Southwestern Medical Center, United States

Poster Board Number: 52

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ID: 7500

**Generative Neural Framework for Micro-Vessels Classification**

Muhammad Zubair Khan{1}, Mohan Kumar Gajendran{2}

{1}University of Central Missouri, United States; {2}University of Missouri-Kansas City, United States

Poster Board Number: 53

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ID: 7524

**Development of Personalized Interpretable Multilevel Prediction Models for the Risk Assessment of Hypoglycemia in Type 1 Diabetes**

Maria Athanasiou, Nefeli Myropoulou, Konstantia Zarkogianni, Konstantina S. Nikita

National Technical University of Athens, Greece

Poster Board Number: 54
**Technical Program – Tuesday, July 16th**

**ID: 7564**
**MedDoc-Bot: A Chat Tool for Comparative Analysis of Large Language Models in the Context of the Pediatric Hypertension Guideline**
Mohamed Yaseen Jabarulla, Steffen Oeltze-Jafra, Philipp Beerbaum, Theodor Uden
Medizinische Hochschule Hannover, Germany
Poster Board Number: 55

**ID: 7582**
**Improving Neonatal Care with AI: Class Weight Optimization for Respiratory Distress Syndrome Prediction in Very Low Birth Weight Infants**
Woocheol Jang, Jinseok Lee
Kyung Hee University, Korea
Poster Board Number: 56

**ID: 7751**
**Predicting Time to Diabetes Diagnosis Using Random Survival Forests**
Priyonto Saha{1}, Yacine Marouf{1}, Hunter Pozzebon{1}, Aziz Guergachi{2}, Karim Keshavjee{1}, Mohammad Noaeen{1}, Zahra Shakeri{1}
{1}University of Toronto, Canada; {2}University of Toronto, Toronto Metropolitan University, Canada
Poster Board Number: 57

**ID: 7887**
**Predicting Diabetes in Canadian Adults Using Machine Learning**
Kayla Esser{1}, Monica Duong{1}, Khalil Kain{1}, Son Tran{1}, Aryan Sadeghi{1}, Aziz Guergachi{2}, Karim Keshavjee{1}, Mohammad Noaeen{1}, Zahra Shakeri{1}
{1}University of Toronto, Canada; {2}University of Toronto, Toronto Metropolitan University, Canada
Poster Board Number: 58

**ID: 7889**
**Optimizing Warfarin Dosing Using Contextual Bandit: An Offline Policy Learning and Evaluation Method**
Yong Huang{1}, Charles Downs{2}, Amir M. Rahmani{1}
{1}University of California, Irvine, United States; {2}University of Miami, United States
Poster Board Number: 59

**ID: 7975**
**Food Recommendation as Language Processing (F-RLP): A Personalized and Contextual Paradigm**
Ali Rostami, Ramesh Jain, Amir M. Rahmani
University of California, Irvine, United States
Poster Board Number: 60

**ID: 7991**
**Cost-Saving Data-Driven Diabetic Retinopathy Prediction via a Sampling-Empowered Incremental Learning Approach**
Anastasiia Oskolkova, Boris Oskolkov, Tieming Liu, Chenang Liu
Oklahoma State University, United States
Poster Board Number: 61
## Tuesday Poster Session - Global Biomedical Technology

4:30:00 PM - 6:00:00 PM  
**Room: Veracruz Hall**

### ID: 6497
**The Development of an Alzheimer’s Diagnostic Sensor and Algorithm Using Microsaccades Biomarkers**  
Seokjun Oh, Jong-Ha Lee  
Keimyung University, Korea  
Poster Board Number: 62

### ID: 7658
**Nomination For-Electrosprayed Thin Films of Multifunctional Melanin Nanoparticles for Photoprotective and Antioxidant Properties**  
Foram Madiyar, Giulia Stewart, Sahil Ghate, Aria Jafari, Kaitlyn Nielsen, Luke Paget, Amelia Hartnett, John Veracka  
Embry-Riddle Aeronautical University, Daytona Beach, United States  
Poster Board Number: 63

## Tuesday Poster Session - Image Segmentation

4:30:00 PM - 6:00:00 PM  
**Room: Veracruz Hall**

### ID: 6117
**Diagonal Hierarchical Consistency Learning for Semi-Supervised Medical Image Segmentation**  
Heejoon Koo  
University College London, United Kingdom  
Poster Board Number: 64

### ID: 6283
**Enhancing Choroidal Nevus Position Identification Through CNN-Based Segmentation of Eye Fundus Images**  
Mohammadmahdi Eshragh{2}, Emad A. Mohammed{3}, Behrouz Far{2}, Trafford Crump{2}, Ezekiel Weis{1}  
{1}University of Alberta, Canada; {2}University of Calgary, Canada; {3}Wilfrid Laurier University, Canada  
Poster Board Number: 65

### ID: 6596
**Unsupervised 3D Lung Segmentation by Leveraging 2D Segment Anything Model**  
Tianrui Liu{4}, Qiyu Wei{5}, Jianguo Chen{6}, Weide Liu{2}, Weimin Huang{1}, Ruchir Srivastava{1}, Zhongyao Cheng{1}, Zeng Zeng{3}, Bharadwaj Veeravalli{4}, Xulei Yang{1}  
{1}Agency for Science, Technology and Research, Singapore; {2}Harvard Medical School, United States; {3}I2R, Agency for Science, Technology and Research, Shanghai University, China; {4}National University of Singapore, Singapore; {5}Shanghai University, China; {6}Sun Yat-sen University, China  
Poster Board Number: 66
ID: 6638
DeepSeg: A Transfer-Learning Segmentation Tool for Limited Sample Training of Nonhuman Primate MRI
Xinhui Li{1}, Xindi Wang{2}, Kathleen Mantell{3}, Estefania Cruz Casillo{3}, Michael Milham{1}, Alex Opitz{3}, Ting Xu{1}
{1}Child Mind Institute, United States; {2}Montreal Neurological Institute, Canada; {3}University of Minnesota Twin Cities, United States
Poster Board Number: 67

ID: 6729
Efficient In-Training Adaptive Compound Loss Function Contribution Control for Medical Image Segmentation
Abdullah Al-Battal{2}, Soan Duong{3}, Chanh Nguyen{3}, Steven Truong{3}, Chien Phan{1}, Truong Nguyen{2}, Cheolhong An{2}
{1}University Medical Center at Ho Chi Minh City, Vietnam; {2}University of California, San Diego, United States; {3}VinBrain JSC, Vietnam
Poster Board Number: 68

ID: 6761
Assessing the Impact of Federated Learning and Differential Privacy on Multi-Centre Polyp Segmentation
Lena Stelter{2}, Valentina Corbetta{1}, Regina Beets-Tan{1}, Wilson Silva{3}
{1}Netherlands Cancer Institute, Netherlands; {2}Ruprecht-Karls-Universität Heidelberg, Germany; {3}Utrecht University, Netherlands
Poster Board Number: 69

ID: 6769
CBAM_SAUNet: A Novel Attention U-Net for Effective Segmentation of Corner Cases
Srividya Tirunellai Rajamani{3}, Kumar Rajamani{2}, Angeline J{1}, Karthika R{1}, Björn Schuller{3}
{1}Amrita Vishwa Vidyapeetham, India; {2}Marwadi University, India; {3}Universität Augsburg, Germany
Poster Board Number: 70

ID: 6849
A Three-Stage Semi-Supervised Learning Approach to Spine Image Segmentation
Ruixiang Pan{2}, Xiaohong Wang{1}, Zhiping Lin{2}, Chi Long Ho{3}, Oliver James Nickalls{3}, Cynthia Assimta Peter{3}, Donovan Tay{3}, Weimin Huang{1}
{1}Agency for Science, Technology and Research, Singapore; {2}Nanyang Technological University, Singapore; {3}Sengkang General Hospital SKH, Singapore
Poster Board Number: 71

ID: 6959
Polyp-DDPM: Diffusion-Based Semantic Polyp Synthesis for Enhanced Segmentation
Zolnamar Dorjembe{2}, Hsing-Kuo Pao{2}, Furen Xiao{1}
{1}National Taiwan University, Taiwan; {2}National Taiwan University of Science and Technology, Taiwan
Poster Board Number: 72
Technical Program – Tuesday, July 16th

ID: 7045
**Single Bone Modeler: Deep Learning Bone Segmentation for Cone-Beam CT**
Eleonora Tiribilli{1}, Ernesto Iadanza{2}, Leonardo Bocchi{1}
{1}Università degli Studi di Firenze, Italy; {2}Università degli Studi di Siena, Italy
Poster Board Number: 73

ID: 7234
**RASpine: Regional Attention Lateral Spinal Segmentation Based on Anatomical Prior Knowledge**
Yue Zhang, Nan Meng, Moxin Zhao, Teng Zhang
University of Hong Kong, Hong Kong
Poster Board Number: 74

ID: 7319
**Diameter-Based Pseudo Labeling for Pathological Image Segmentation**
Yuki Shigeyasu{3}, Shota Harada{1}, Akihiko Yoshizawa{4}, Kazuhiro Terada{2}, Ryoma Bise{3}
{1}Hiroshima City University, Japan; {2}Kyoto University, Japan; {3}Kyushu University, Japan; {4}Nara Medical University, Japan
Poster Board Number: 75

ID: 7437
**Navigating Noise and Texture: Motion Compensation Methodology for Fluorescence Lifetime Imaging in Pulmonary Research**
Tarek Haloubi{3}, Spencer A. Thomas{2}, Catherine Hines{1}, Kevin Dhaliwal{3}, James R. Hopgood{3}
{1}GSK plc, United States; {2}National Physical Laboratory, United Kingdom; {3}University of Edinburgh, United Kingdom
Poster Board Number: 76

ID: 7531
**Reconstruction of 3D Lumbar Spine Models from Incomplete Segmentations Using Landmark Detection**
Lara Blomenkamp, Ivanna Kramer, Sabine Bauer, Kevin Weirauch, Dietrich Paulus
Universität Koblenz, Germany
Poster Board Number: 77

ID: 7638
**Cut-Puzzle Mix: Scribble Guided Medical Image Segmentation Without Segmentation Masks**
Ibsa Jalata, Ukash Nakarmi
University of Arkansas, United States
Poster Board Number: 78

ID: 7698
**Weakly Supervised Breast Ultrasound Image Segmentation Based on Image Selection**
Tzu-Han Lin, Daehan Kwak, Kuan Huang
Kean University, United States
Poster Board Number: 79
ID: 7789
**PAM-UNet: Shifting Attention on Region of Interest in Medical Images**  
Abhijit Das{1}, Debesh Jha{1}, Vandan Gorade{2}, Koushik Biswas{1}, Hongyi Pan{1}, Zheyuan Zhang{1}, Daniela P. Ladner{2}, Yury Velichko{1}, Amir Borhani{1}, Ulas Bagci{1}  
{1}Machine & Hybrid Intelligence Lab, Northwestern University, United States; {2}Northwestern University, United States  
Poster Board Number: 80

ID: 7854
**Clisp: A Robust Interactive Segmentation Framework for Pathological Images**  
Hannan Wang{1}, Jun Shi{1}, Minfan Zhao{1}, Liang Qiao{1}, Zhaohui Wang{1}, Yue Dai{1}, Yuchen Ma{3}, Hong An{2}  
{1}University of Science and Technology of China, China; {2}University of Science and Technology of China, Laoshan Laboratory, China; {3}University of Virginia, United States  
Poster Board Number: 81

ID: 8071
**Dual Prototypical Self-Supervised Learning for One-Shot Medical Image Segmentation**  
Ziyuan Zhao{1}, Zhi Qing Ng{3}, Zhongyao Cheng{1}, Jiahao Wang{3}, Xulei Yang{1}, Hanry Yu{3}, Cuntai Guan{2}  
{1}Agency for Science, Technology and Research, Singapore; {2}Nanyang Technological University, Singapore; {3}National University of Singapore, Singapore  
Poster Board Number: 82

ID: 8073
**Structure Preserving Cycle-GaN for Unsupervised Medical Image Domain Adaptation**  
Paolo Iacono, Naimul Mefraz Khan  
Toronto Metropolitan University, Canada  
Poster Board Number: 83

ID: 6390
**Feature Tensor Low-Rank Representation Network for Semi-Supervised Echocardiography Video Left Ventricle Segmentation**  
Xiaodi Li, Yingjiao Hu, Yue Hu  
Harbin Institute of Technology, China  
Poster Board Number: 84

ID: 7400
**Deep Left Ventricular Motion Estimation Methods in Echocardiography: A Comparative Study**  
Sofia Ferraz{1}, Miguel Coimbra{2}, João Pedrosa{1}  
{1}INESC TEC, Portugal; {2}INESC TEC, Universidade do Porto, Portugal  
Poster Board Number: 85
ID: 6088
**Multiparametric Liver Biomarker Analysis Using MR Elastography and MRI for Non-Invasive Assessment of Fibrosis, Steatosis, and Iron Overload in Patients with Non-Alcoholic Fatty Liver Disease**

Diego Lamtenzan-Marcos{2}, Pilar Castellote-Huguet{1}, Juan Antonio Romero-Martín{1}, Andrés Marcos-Carrión{2}, José Manuel Santabárbara{1}, Alicia M. Maceira{1}, David Moratal{2}

{1}ASCIRES Biomedical Group, Spain; {2}Universitat Politècnica de València, Spain

Poster Board Number: 86

ID: 6186
**3D Multi-Feature Fusion Convolutional Network for Alzheimer’s Disease Diagnosis**

Jiaojiao Feng{2}, Maowen Ba{1}, Nan Li{2}, Gang Wang{2}

{1}Affiliated Yantai Yuhuangding Hospital of Qingdao University, China; {2}Ludong University, China

Poster Board Number: 87

ID: 6241
**An Investigation of Triple-Tuned Traps for MRI Receiver Coil Design**

Joseph Busher, Jue Hou, Steven Wright, Mary McDougall

Texas A&M University, United States

Poster Board Number: 88

ID: 6299
**Transformer-Based Functional Time Series Modeling to Unveil Dynamic Brain State Transitions**

Yurim Jang{1}, Jong Young Namgung{1}, Yeongjun Park{1}, Bo-Yong Park{2}

{1}Inha University, Korea; {2}Inha University & Institute for Basic Science, Korea

Poster Board Number: 89

ID: 6843
**Functional Connectivity of Salience Network Predicts Treatment Outcome for rTMS in Mild Cognitive Impairment**

Zhiwei Guo{3}, Yi Jiang{1}, Ning Jiang{2}

{1}National Clinical Research Center for Geriatrics, West China Hospital, Sichuan University, China; {2}West China Hospital of Sichuan University, China; {3}West China Hospital, Sichuan University, China

Poster Board Number: 90

ID: 7332
**The Longitudinal Study of Morphometric Measurement Changes in Progressive Supranuclear Palsy**

Ronghua Ling{4}, Yinghui Yang{2}, Juanjuan Jiang{1}, Min Wang{3}

{1}Anhui Polytechnic University, China; {2}Shanghai Jian Qiao University, China; {3}Shanghai University, China; {4}ShanghaiTech University of Medicine & Health Sciences, China

Poster Board Number: 91
ID: 7420
**A Modified Reference Scan Method for MR Image Inhomogeneity Correction**
Yufu Zhou{3}, Zhicheng Liu{1}, Penghui Luo{3}, Xiaohan Hao{3}, Mengdie Song{2}, Fulang Qi{3}, Bensheng Qiu{2}
{1}Fuqing Medical Co., Ltd., China; {2}University of Science and Technology of China, China; {3}University of Science and Technology of China, Fuqing Medical Co., Ltd., China
Poster Board Number: 92

ID: 7431
**A Fast Co-Registration Scheme Between Camera and MRI for MRI-Guided Surgery**
Fulang Qi{2}, Xiaohan Hao{2}, Zheyu Guo{1}, Penghui Luo{2}, Mengdie Song{1}, Bensheng Qiu{1}
{1}University of Science and Technology of China, China; {2}University of Science and Technology of China, Fuqing Medical Co., Ltd., China
Poster Board Number: 93

ID: 7462
**Highly Accelerated Three-Dimensional Free-Breathing Cardiac T2 Mapping with Modified Low-Rank Modeling of Local k-Space Neighborhoods**
Jiaojiao Hu{2}, Jiantai Zhou{2}, Congyu Liao{1}, Yanming Wang{2}, Xiaohan Hao{3}, Bensheng Qiu{2}
{1}Stanford University, China; {2}University of Science and Technology of China, China; {3}University of Science and Technology of China, Fuqing Medical Co., Ltd., China
Poster Board Number: 94

ID: 7629
**Low-Rank Constrained Reacquired-Navigator Reconstruction of Multi-Shot DWI**
Jiantai Zhou{1}, Huabin Zhang{1}, Penghui Luo{2}, Changliang Wang{1}, Fulang Qi{2}, Jiaojiao Hu{1}, Kecheng Yuan{1}, Bensheng Qiu{1}
{1}University of Science and Technology of China, China; {2}University of Science and Technology of China, Fuqing Medical Co., Ltd., China
Poster Board Number: 95

ID: 7715
**Automated Basilar Artery Lumen Segmentation for High Resolution in Black Blood MRI**
Chien-Hung Tsou{2}, Wei Chen Chang{2}, Hon-Man Liu{1}, Adam Huang{2}
{1}Fu Jen Catholic University Hospital, Taiwan; {2}National Central University, Taiwan
Poster Board Number: 96

ID: 6524
**The Recurrent U-Net for Needle Segmentation in Ultrasound Image-Guided Surgery**
Yao Chen{2}, Hui Che{2}, Zihan Ji{2}, Jiaxin Qin{2}, Yibin Huang{1}, Jian Wu{2}
{1}Shenzhen Traditional Chinese Medicine Hospital, China; {2}Tsinghua University, China
Poster Board Number: 97
ID: 7104
**Residual Neural Networks for the Prediction of the Regularization Parameters in PET Reconstruction**
Younes Moussaoui{3}, Diana Mateus{2}, Said Moussaoui{2}, Thomas Carlier{1}, Simon Stute{1}
{1}Nantes Université, CHU Nantes, CRCI2NA, France; {2}Nantes Université, École Centrale Nantes, LS2N, CNRS, France; {3}Université de Nantes, CHU de Nantes, École Centrale Nantes, LS2N, CNRS, France
Poster Board Number: 98

ID: 7816
**Proposal and Comparison of Quality Measures in Crawling Waves Sonoelastography**
Sebastian Merino{2}, Stefano Enrique Romero Gutierrez{1}, Alexys Caytano{2}, Hans Trujillo{2}, Benjamin Castañeda Aphan{3}
{1}Laboratorio de Imágenes Médicas, Pontificia Universidad Católica del Perú, Peru; {2}Pontificia Universidad Católica del Perú, Peru; {3}Pontificia Universidad Católica del Perú, University of Rochester, Peru
Poster Board Number: 99

ID: 6050
**Projection Image Synthesis Using Adversarial Learning Based Spatial Transformer Network for Sparse Angle Sampling CT**
Huanyi Zhou{3}, Stanley Reeves{1}, Jueting Liu{2}
{1}Auburn University, United States; {2}China University of Mining and Technology, China; {3}Johns Hopkins University, United States
Poster Board Number: 100

ID: 6245
**Multiple Angle Key Points Detection Guided Screening of Unruptured Intracranial Aneurysms**
Yuanyuan Xu, Jiliu Zhou, Yan Liu
Sichuan University, China
Poster Board Number: 101

ID: 6320
**Camera-Based Gait Kinematic Features Analysis and Recognition of Autism Spectrum Disorder**
Minghao Du{1}, Tao Li{1}, Yunuo Xu{1}, Peng Fang{1}, Xin Xu{2}, Ping Shi{2}, Wei Liu{2}, Xiaoya Liu{1}, Shuang Liu{1}
{1}Tianjin University, China; {2}Tianjin University Children’s Hospital, China
Poster Board Number: 102

ID: 6368
**Dual-Source CBCT for Larger Longitudinal Coverage: System Design and Image Reconstruction**
Xusheng Zhang{2}, Tianling Lyu{3}, Yijie Shi{2}, Xinyun Zhong{2}, Zhan Wu{2}, Yan Xi{1}, Shijie Wang{2}, Yang Chen{2}, Wentao Zhu{3}
{1}Jiangsu First-imaging Medical Equipment Co., LTD, China; {2}Southeast University, China; {3}Zhejiang Lab, China
Poster Board Number: 103
Technical Program – Tuesday, July 16th

ID: 6399
Direct Comparison of Ultrasound and Tactile Imaging in Measuring Lesion Diameter in Breast Phantoms
Nassima Salhi, Rory Hampson, Alistair Lawley, Gordon Dobie
University of Strathclyde, United Kingdom
Poster Board Number: 104

ID: 6555
Selection of Dataframes Presenting Glioma from Magnetic Resonance Images: A Deep Learning Approach
Giulia Bruschi, Francesca Vassallo, Agnese Sbrollini, Micaela Morettini, Laura Burattini
Università Politecnica delle Marche, Italy
Poster Board Number: 105

ID: 6649
Intra-Guided Dual-Energy Material Decomposition Method for Dual-Source CBCT Systems
Xinyun Zhong{3}, Tianling Lyu{4}, Zhan Wu{3}, Wei Gao{3}, Yan Xi{2}, Wei Zhao{1}, Wentao Zhu{4}, Yang Chen{3}
{1}Beihang University, China; {2}Jiangsu First-imaging Medical Equipment Co., LTD, China; {3}Southeast University, China; {4}Zhejiang Lab, China
Poster Board Number: 106

ID: 6825
SSN: Monitoring Liver Injure Through Signal Separation Network in Dynamic Fluorescence Molecular Tomography
Yizhe Zhao, Lizhi Zhang, Jintao Li, Heng Zhang, De Wei, Xiaowei He, Hongbo Guo
Northwest University, China
Poster Board Number: 107

ID: 6905
Advancing Chest X-Ray Diagnostics via Multi-Modal Neural Networks with Attention
Douglas Townsell, Tanvi Banerjee, Lingwei Chen, Michael Raymer
Wright State University, United States
Poster Board Number: 108

ID: 6916
Automated Offline Smartphone-Assisted Microfluidic Paper-Based Analytical Device for Biomarker Detection of Alzheimer’s Disease
Sixuan Duan{3}, Ruiqi Yong{3}, Hang Yuan{3}, Tianyu Cai{3}, Kaizhu Huang{1}, Kai Hoettges{2}, Eng Gee Lim{3}, Pengfei Song{3}
{1}Duke Kunshan University, China; {2}University of Liverpool, United Kingdom; {3}Xi’an Jiaotong-Liverpool University, China
Poster Board Number: 109
ID: 7136
**Acute Pain Recognition from Facial Expression Videos Using Vision Transformers**
Ghazal Bargshady{1}, Calvin Joseph{2}, Niraj Hirachan{2}, Roland Goecke{1}, Raul Fernandez Rojas{2}
{1}Human-Centred Technology Research Centre, University of Canberra, Australia; {2}University of Canberra, Australia
Poster Board Number: 110

ID: 7141
**PCNet: Accurate Surgical Workflow Recognition with Phase Consistency**
Binh Tran{2}, Dana Kulić{2}, Simon M. Harrison{1}, Charles Pilgrim{2}, Elahe Abdi{2}
{1}Commonwealth Scientific and Industrial Research Organisation, Australia; {2}Monash University, Australia
Poster Board Number: 111

ID: 7188
**ANTS, BET, or...Neither? An Exploration of Brain Masking and Machine Learning Tools Applied to Magnetic Resonance Elastography**
John Squire{2}, Aaron Anderson{2}, Curtis Johnson{1}, Bradley Sutton{2}
{1}University of Delaware, United States; {2}University of Illinois Urbana-Champaign, United States
Poster Board Number: 112

ID: 7251
**NEAT-Net: An Unsupervised Cross-View Prior Inpainting Network for CBCT Metal Artifact Reduction**
Yang Yang{2}, Zhan Tong{2}, Xinyun Zhong{2}, Yijie Shi{2}, Yan Xi{1}, Wenxue Yu{2}, Zhan Wu{2}, Yang Chen{2}
{1}Jiangsu First-imaging Medical Equipment Co., LTD, China; {2}Southeast University, China
Poster Board Number: 113

ID: 7368
**Optimizing Diagnosis in Sparse Data Environments: A Model Agnostic Meta Learning Approach**
Kanishka Ranaweera, Pubudu N. Pathirana
Deakin University, Australia
Poster Board Number: 114

ID: 7566
**Next-Generation Teleophthalmology: AI-Enabled Quality Assessment Aiding Remote Smartphone-Based Consultation**
Dhruv Srikanth{1}, Jayang Gurung{2}, Satya Deepika Neelapala{1}, Vineet Joshi{2}, Lopamudra Giri{1}, Pravin Vaddavalli{2}, Soumya Jana{1}
{1}Indian Institute of Technology Hyderabad, India; {2}L V Prasad Eye Institute, Hyderabad, India
Poster Board Number: 115
ID: 7691
Rat Tongue Kinematics with Markerless XROMM Using DeepLabCut and Marker Masking
Philipp Flotho{2}, Mohamed El-Tabbal{1}, Teresa Lever{3}, Kazutaka Takahashi{3}
{1}Okinawa Institute of Science and Technology, Japan; {2}Saarland University Hospital, Germany; 
{3}University of Missouri, United States
Poster Board Number: 116

ID: 7721
Visual Representation of Tabular Electronic Health Records for Predicting Sudden Cardiac Arrest
Rubya Afrin{1}, Emad A. Mohammed{2}, Behrouz Far{1}
{1}University of Calgary, Canada; {2}Wilfrid Laurier University, Canada
Poster Board Number: 117

ID: 7730
Detection of Hospital Super Bacteria MRSA from the Hands of Healthcare Professionals Using Machine Learning and Hyperspectral Imaging
Arlindo Rodrigues Galvão Filho{1}, Carolina Andrade{1}, Raylane Gomes{1}, Lilian Carneiro{1}, Melissa Avelino{1}, Clarimar Coelho{2}
{1}Federal University of Goiás, Brazil; {2}Pontifical Catholic University of Goiás, Brazil
Poster Board Number: 118

ID: 7765
Optimizing Modified Barium Swallow Exam Workflow: Automating Pre-Analysis Video Sorting in Swallowing Function Assessment
Shitong Mao, Mohamned Naser, Sheila Buoy, Kristy Brock, Katherine Hutcheson
University of Texas M.D. Anderson Cancer Center, United States
Poster Board Number: 119

ID: 7891
Sex Differences in the Brain’s White Matter Microstructure During Development Assessed Using Advanced Diffusion MRI Models
Sebastian Benavidez{3}, Zvart Abaryan{1}, Gaon Kim{3}, Emily Laltoo{3}, James McCracken{2}, Paul M. Thompson{3}, Katherine Lawrence{3}
{1}Children’s Hospital Los Angeles, United States; {2}University of California San Francisco, United States; {3}University of Southern California, United States
Poster Board Number: 120

ID: 7911
PET Myocardial Flow Reserve Estimation from 4D-Coronary-CT Using Deep Neural Network
Chenxi Shen{1}, Takafumi Iwaguchi{1}, Shaodi You{3}, Masateru Kawakubo{1}, Michinobu Nagao{2}, Hiroshi Kawasaki{1}
{1}Kyushu University, Japan; {2}Tokyo Women's Medical University, Japan; {3}University of Amsterdam, Netherlands
Poster Board Number: 121
ID: 7968
Floating Solenoid Cable Trap
Roman Venegas, Joseph Busher, Donald Bowen, Edith Touchet-Valle, Mary McDougall
Texas A&M University, United States
Poster Board Number: 122

ID: 8051
Optimizing PET Detector Performance and Calibration Through Flood Histogram Analysis
Abdullah Refaey, Ramsey Badawi
University of California, Davis, United States
Poster Board Number: 123

ID: 8097
Two-Stage Hybrid Convolutional-Transformer Models for Breast Cancer Histopathology
Abdelwahhab Boudjelal{2}, Yassine Belkheiri{2}, Abderrahim Elmoataz{2}, Abdelhak Goudjil{1}, Bilal Attallah{3}
{1}IPSA Institute of Polytechnic Science and Aeronautics, France; {2}Université de Caen, France;
{3}University Mohamed Boudiaf of M’Sila, Algeria
Poster Board Number: 124

Tuesday Poster Session - Machine Learning & Deep learning for Brain Signals
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6023
Evaluating Augmentation Approaches for Deep Learning-Based Major Depressive Disorder Diagnosis with Raw Electroencephalogram Data
Charles Ellis, Robyn L. Miller, Vince D. Calhoun
TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board Number: 125

ID: 6051
Dataset-Independent EEG Channel Selection for Emotion Recognition
Shyamal Dharia, Sergio Camorlinga, Camilo Valderrama, Mahdis Hojjati
University of Winnipeg, Canada
Poster Board Number: 126

ID: 6118
Interpretable SincNet-Based Spatiotemporal Neural Network for Seizure Prediction
Baolian Shan, Haiping Yu, Hanzhe Jiang, Yongzhi Huang, Minpeng Xu, Dong Ming
Tianjin University, China
Poster Board Number: 127
ID: 6203
**HeteroEEG: A Dual-Branch Spatial-Spectral-Temporal Heterogeneous Graph Network for EEG Classification**
Zanhao Fu{1}, Huaiyu Zhu{1}, Ruohong Huan{2}, Yi Zhang{1}, Shuohui Chen{1}, Yun Pan{1}
{1}Zhejiang University, China; {2}Zhejiang University of Technology, China
Poster Board Number: 128

ID: 6212
**Deep Residual Neural Networks for Spatial EEG Source Imaging**
Qingyuan Shi, Haiqing Yu, Yongzhi Huang, Feng He
Tianjin University, China
Poster Board Number: 129

ID: 6391
**Explainable Framework to Detect Parkinson’s Disease Related Depression from EEG**
Luyao Jin{1}, Running Zhao{2}, Junyi Cao{3}, Vincent C. K. Cheung{1}, Wei-Hsin Liao{1}
{1}Chinese University of Hong Kong, China; {2}University of Hong Kong, China; {3}Xi’an Jiaotong University, China
Poster Board Number: 130

ID: 6593
**Classification of Schizophrenia Using Intrinsic Connectivity Networks and Incremental Boosting Convolution Neural Networks**
Duc My Vo, Sergey Plis, Vince D. Calhoun
TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board Number: 131

ID: 6608
**Decoding Visual Perception from EEG Using Explainable Graph Neural Network**
Chin-Wei Huang, Chien-Hui Su, Po-Chih Kuo
National Tsing Hua University, Taiwan
Poster Board Number: 132

ID: 6710
**EEG Signal Denoising Using Beta-Variational Autoencoder**
Behzad Mahaseni, Naimul Mefraz Khan
Toronto Metropolitan University, Canada
Poster Board Number: 133

ID: 6808
**Cross-Subject EEG-Based Motor Imagery Recognition for Patient’s Rehabilitation**
Yalan Ye{4}, Xinxin Mu{4}, Tongjie Pan{4}, Yuxiang Li{4}, Lin Wei{2}, Xiaoli Fan{1}, Lan Wei{3}
{1}Air Force Medical University, China; {2}Civil Aviation Flight University of China, China; {3}University College Dublin, Ireland; {4}University of Electronic Science and Technology of China, China
Poster Board Number: 134
Scepter: Weakly Supervised Framework for Spatiotemporal Dense Prediction of 4D Dynamic Brain Networks
Behnam Kazemivash{1}, Pranav Suresh{2}, Jingyu Liu{2}, Dong Hye Ye{1}, Vince D. Calhoun{3}
{1}Georgia State University, United States; {2}TReNDS Center, Georgia State University, United States; {3}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board Number: 135

Brain Age Analysis and Dementia Classification Using Convolutional Neural Networks Trained on Diffusion MRI: Tests in Indian and North American Cohorts
{1}Multimodal Brain Image Analysis Laboratory, National Institute of Mental Health and Neuro Sciences, India; {2}National Institute of Mental Health and Neuro Sciences, India; {3}University of Southern California, United States
Poster Board Number: 136

SpaDE: Semantic Locality Preserving Biclustering for Neuroimaging Data
Md Abdur Rahaman{1}, Zening Fu{2}, Armin Iraji{2}, Vince D. Calhoun{2}
{1}Georgia Institute of Technology, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board Number: 137

Enhancing Epileptic Seizure Detection with Random Input Selection in Graph-Wave Networks
Yonglin Wu{2}, Jionghui Liu{1}, Yangyang Yuan{1}, Haoran Ren{3}, Chenyun Dai{2}, Yao Guo{2}
{1}Fudan University, China; {2}Shanghai Jiao Tong University, China; {3}University of Shanghai for Science and Technology, China
Poster Board Number: 138

Workload Estimator Using EEG and Eye-Tracking
Ivan Tashev{4}, Christine Beauchene{3}, Michael Winters{4}, Yu-Te Wang{2}, David Johnston{4}, Nathaniel Bridges{1}, Justin Estepp{1}
{1}Air Force Research Laboratory, United States; {2}CITI, Academia Sinica, Microsoft Research, Taiwan; {3}Massachusetts Institute of Technology, United States; {4}Microsoft Research, United States
Poster Board Number: 139

EEG Artifact Removal Using Stacked Multi-Head Attention Transformer Architecture
Gowtham Reddy N, Debashree Guha, Manjunatha Mahadevappa
Indian Institute of Technology Kharagpur, India
Poster Board Number: 140
The Impact of Cross-Validation Schemes for EEG-Based Auditory Attention Detection with Deep Neural Networks
Gabriel Ivucic{3}, Saurav Pahuja{3}, Felix Putze{3}, Siqi Cai{2}, Haizhou Li{2}, Tanja Schultz{1}
{1}Cognitive Systems Lab, Universität Bremen, Germany; {2}National University of Singapore, Singapore; {3}Universität Bremen, Germany
Poster Board Number: 141

BISeizuRe: BERT-Inspired Seizure Data Representation to Improve Epilepsy Monitoring
Luca Benfenati{2}, Thorir Mar Ingolfsson{1}, Andrea Cossettini{1}, Daniele Jahier Pagliari{2}, Alessio Burrello{2}, Luca Benini{3}
{1}ETH Zürich, Switzerland; {2}Politecnico di Torino, Italy; {3}Università di Bologna, Italy
Poster Board Number: 142

Parallel Multilink Joint ICA for Multimodal Fusion of Gray Matter and Multiple Resting fMRI Networks
K M Ibrahim Khalilullah{1}, Oktay Agcaoglu{1}, Marlena Duda{1}, Vince D. Calhoun{2}
{1}TReNDS Center, Georgia State University, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board Number: 143

Graph-Based Deep Learning Models in the Prediction of Early-Stage Alzheimers
Bishal Thapaliya{3}, Zundong Wu{1}, Ram Sapkota{2}, Bhaskar Ray{3}, Pranav Suresh{3}, Santosh Ghimire{5}, Vince D. Calhoun{4}, Jingyu Liu{3}
{1}Georgia Institute of Technology, United States; {2}Georgia State University, United States; {3}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States; {4}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States; {5}Tribhuvan University, Nepal
Poster Board Number: 144

Spike Isolation from Background Signal in Neonatal EEG Data Using an Integrated Independent Component Analysis Method
Mina Ezzati Asl{1}, Josué Rodriguez{1}, Mercedes Cabrerozi{1}, Anuj Jayakar{2}, Armando Barreto{1}, Malek Adjouadi{1}
{1}Florida International University, United States; {2}Nicklaus Children's Hospital, United States
Poster Board Number: 145

Transformer-Based Emotion Recognition with EEG
Kulin Patel{2}, Farshad Safavi{2}, Rajarathnam Chandramouli{1}, Ramana Vinjamuri{2}
{1}Spectronn, United States; {2}University of Maryland Baltimore County, United States
Poster Board Number: 146
Technical Program – Tuesday, July 16th

ID: 7832
**EEG Tensorization Enhances CNN-Based Outcome Classification in Comatose Patients Following a Cardiac Arrest**
Rafael Teodoro Ors-Quixal{2}, Samuel Ruipérez-Campillo{1}, Francisco Castells-Ramón{2}, José Millet{2}
{1}ETH Zürich, Switzerland; {2}Universitat Politècnica de València, Spain
Poster Board Number: 147

ID: 7862
**Label Noise-Robust Ensemble Deep Multimodal Framework for Neuroimaging Data**
Hooman Rokham, Haleh Falakshahi, Vince D. Calhoun
TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board Number: 148

ID: 7910
**Long-Short Term Memory Autoencoder Using Delta with Beta Bands of EEG Enables Highly Accurate Prediction of Seizure Outcome in Infantile Epileptic Spasms Syndrome of Unknown Etiology**
Ryosuke Suzui, Jun Natsume, Tastuki Saito, Koichi Fujiwara
Nagoya University, Japan
Poster Board Number: 149

ID: 7921
**Robust k-means-Based Clustering of Independent Components Estimated from the EEG Data**
Vikram Shenoy Handiru{2}, Easter Selvan Suviseshamuthu{2}, Guang H. Yue{2}, Didier Allexandre{1}
{1}Biofourmis, United States; {2}Kessler Foundation, United States
Poster Board Number: 150

**Tuesday Poster Session - Machine Learning & Deep Learning for Heart & Vascular Signals**
4:30:00 PM - 6:00:00 PM
*Room: Veracruz Hall*

ID: 6095
**Vascular Age Evaluation Enhanced Using Recurrence Plot Analysis and Convolutional Neural Networks: An In-Silico Study**
Eugenia Ipar{2}, Leandro Javier Cymberknop{2}, Ricardo Luis Armentano{1}
{1}Universidad de la República CenUR Litoral Norte, Uruguay; {2}UTN FRBA - Universidad Tecnológica Nacional, Argentina
Poster Board Number: 151

ID: 6119
**From Sprint to Recovery: LSTM-Powered Heart Rate Recovery Forecasting in HIIT Sessions**
Illia Fedorin, Anastasiia Smielova, Margaryta Nastenko, Illia Krasnoshchok
Samsung R&D Institute Ukraine, Ukraine
Poster Board Number: 152
ID: 6121
**Exploring Pre-Trained General-Purpose Audio Representations for Heart Murmur Detection**
Daisuke Niizumi, Daiki Takeuchi, Yasunori Ohishi, Noboru Harada, Kunio Kashino
NTT Corporation, Japan
Poster Board Number: 153

ID: 6881
**Bayesian Optimization in Restricted Boltzmann Machines for Heart Failure Severity Estimation**
Theofilos Papadopoulos{1}, Evanthia Tripoliti{1}, Yorgos Goletsis{1}, Aris Bechlioulis{1}, Katerina Naka{1}, Dimitrios I. Fotiadis{2}
{1}University of Ioannina, Greece; {2}University of Ioannina, FORTH-BRI, Greece
Poster Board Number: 154

ID: 7005
**Explainable Multimodal Deep Learning for Heart Sounds and Electrocardiogram Classification**
Bruno Oliveira{2}, André Lobo{1}, Cátia Isabel Costa{3}, Ricardo Fontes-Carvalho{4}, Miguel Coimbra{2}, Francesco Renna{2}
{1}Centro Hospitalar de Vila Nova de Gaia/Espinho, Portugal; {2}INESC TEC, Universidade do Porto, Portugal; {3}Polytechnic of Porto, Centro Hospitalar de Vila Nova de Gaia/Espinho, Portugal; {4}University of Porto, Centro Hospitalar de Vila Nova de Gaia/Espinho, Portugal
Poster Board Number: 155

ID: 7195
**Exploring wav2vec 2.0 Model for Heart Sound Analysis**
Alex Paul Kamson{1}, Akshay V. Sawant{1}, Prasanta Kumar Ghosh{2}, Satish S Jeevannavar{1}
{1}AI Health Highway India Pvt Ltd, India; {2}Indian Institute of Science, India
Poster Board Number: 156

ID: 7238
**Harnessing Vision Transformer Insights for Advanced Electrocardiogram Classification**
Pubudu L. Indrasiri, Bipasha Kashyap, Pubudu N. Pathirana
Deakin University, Australia
Poster Board Number: 157

ID: 7360
**BioAgeNet: An Age-Informed Convolutional Autoencoder for ECG Clustering Indicating Health**
Varsha Sharma, Avik Ghose
Tata Consultancy Services Limited, India
Poster Board Number: 158

ID: 7901
**Arterial Diameter Trend Estimation Using Deep Learning on Ultrasound Spectral Doppler**
Aaron Lozhkin{2}, Stephanie Iring-Sanchez{1}, Jorge Serrador{3}, Valentin Siderskiy{3}
{1}Rutgers University, United States; {2}Rutgers University–New Brunswick, United States; {3}Western Sydney University, Australia
Poster Board Number: 159
### Technical Program – Tuesday, July 16th

#### ID: 8095
**Deep Learning for Identifying Systolic Complexes in SCG Traces: A Cross-Dataset Analysis**  
Michele Craighero, Sarah Solbiati, Federica Mozzini, Enrico Caiani, Giacomo Boracchi  
*Politecnico di Milano, Italy*  
Poster Board Number: 160

#### ID: 6352
**Advancements in Continuous Glucose Monitoring: Integrating Deep Learning and ECG Signal**  
Mohammadreza Hosseinzadehktilateh, Banafsheh Adami, Nima Karimian  
*West Virginia University, United States*  
Poster Board Number: 161

### Tuesday Poster Session - Neural Interfaces, Systems & Rehabilitation  
4:30:00 PM - 6:00:00 PM  
*Room: Veracruz Hall*

#### ID: 6147
**Investigation of Sex-Related Functional Connectivity Alterations in Autism Using Class Imbalance Mitigation Approach**  
Jong Young Namgung\{1\}, Jongmin Mun\{3\}, Yeong Jun Park\{1\}, Jaeoh Kim\{1\}, Bo-Yong Park\{2\}  
\{1\}Inha university, Korea; \{2\}Inha University & Institute for Basic Science, Korea; \{3\}University of Southern California, United States  
Poster Board Number: 162

#### ID: 6450
**Transcriptomic Study of Neural Regulation in the Medial Prefrontal Cortex of Depressive Mice with Low-Intensity Focused Ultrasound**  
Qiuquan Cai, Lianghui Meng, Ling Wang, Jing Ren, Jiajia Yang, Dong Ming  
*Tianjin university, China*  
Poster Board Number: 163

#### ID: 6566
**Video-Based Clinical Gait Analysis in Parkinson’s Disease: A Novel Approach Using Frontal Plane Videos and Machine Learning**  
Marc C. Pappas\{1\}, David Boughanem\{1\}, Sidney Baudendistel\{2\}, Si Chen\{1\}, Shuyu Liu\{1\}, Gabriela T. Acevedo\{1\}, Diego L. Guarin\{1\}  
\{1\}University of Florida, United States; \{2\}Washington University in St. Louis, United States  
Poster Board Number: 164

#### ID: 6775
**Localizing the Seizure Onset Zone with Bayesian Learning During iEEG Monitoring**  
Amir Hossein Daraie\{1\}, Adam Charles\{1\}, Alana Chandler\{1\}, Luis Sanchez\{1\}, Joon-Yi Kang\{2\}, Sridevi Sarma\{2\}  
\{1\}Johns Hopkins University, United States; \{2\}Johns Hopkins University, Johns Hopkins Medicine, United States  
Poster Board Number: 165
ID: 6994
**Evaluation of Spasticity Changes During Manual Hand Therapy Based on sEMG Features**
Cong Yu{3}, Chengjun Xiao{3}, Ting Han{3}, Xiufang Zhang{1}, Xing Ma{1}, Quan Li{2}, Fan Feng{2}, Wei Chen{1}, Xinyang Tan{3}
{1}Affiliated Xuzhou Rehabilitation Hospital of Xuzhou Medical University, China; {2}Renji Hospital, Shanghai Jiaotong University, China; {3}Shanghai Jiao Tong University, China
Poster Board Number: 166

ID: 7058
**Mild Cognitive Impairment Detection Through Gait Analysis and Standard Cameras**
Brennen Farrell{1}, Julia Horn{1}, Mahmoud Seifallah{1}, James E Galvin{2}, Behnaz Ghoraani{1}
{1}Florida Atlantic University, United States; {2}University of Miami, United States
Poster Board Number: 167

ID: 7139
**Latent Inhibition Improves Discriminative Fear Conditioning in Rat Model for Schizophrenia**
Karin Oshima{2}, Shinichi Kumagai{1}, Tomoyo Isoguchi Shiramatsu{2}, Hirokazu Takahashi{2}
{1}Jichi Medical University, Japan; {2}University of Tokyo, Japan
Poster Board Number: 168

ID: 7322
**An Improved Neurosurgical Planning Method for Focal Epileptic Seizure Surgery Using Stereo-EEG-Based Source Localization and Multimodal Imaging**
Thomas Hartigan{3}, Lauren Byrne{1}, Sarah Lavelle{3}, Ali McDonnell{3}, Kieron Sweeney{2}, Richard Reilly{3}
{1}Beaumont Hospital, Ireland; {2}Beaumont Hospital, Ireland; {3}Trinity College Dublin, Ireland
Poster Board Number: 169

ID: 7418
**Usability of a Mobile Application for Patients with Parkinson's Disease**
Gent Ymeri{2}, Benjamin Maus{2}, Myrthe Wassenburg{1}, Carl Magnus Olsson{2}, Per Svenningsson{1}, Dario Salvi{2}
{1}Karolinska Institute, Sweden; {2}Malmö University, Sweden
Poster Board Number: 170

ID: 7441
**Dysarthria Detection with Deep Representation Learning for Patients with Parkinson's Disease**
Chen Zhang, Chen Gong, Yanan Sui
Tsinghua University, China
Poster Board Number: 171

ID: 7680
**Exploration of a Network-Based EEG Marker for Major Depressive Disorder**
Clara Lemaitre{1}, Adam Charles{1}, Sridevi Sarma{2}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States
Poster Board Number: 172
ID: 7732  
**Scalp EEG Correlates of Anti-Seizure Medications in Adult Epilepsy**  
Alana Chandler{1}, Amir Hossein Daraie{1}, Patrick Myers{1}, Jeff Craley{1}, Sridevi Sarma{2}, Joon-Yi Kang{2}  
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States  
Poster Board Number: 173

ID: 7905  
**High-Order Resting-State Functional Connectivity Is Predictive of Working Memory Decline After Brain Tumor Resection**  
Triet Tran, Thi Tran, Sina Khanmohammadi  
University of Oklahoma, United States  
Poster Board Number: 174

ID: 8009  
**Integrating Mixed Reality and Body Weight Support Technology for Immersive Pediatric Rehabilitation**  
Tristan McCarty{1}, Smrithi Surender{1}, Cary Shu{2}, Zijian Huang{2}, Jiasi Chen{2}, Elena Kokkon{1}  
{1}University of California, Riverside, United States; {2}University of Michigan, United States  
Poster Board Number: 175

ID: 8048  
**Neural Complexity Unveiled: Doubly Functionally Independent Primitives (dFIPs) in Psychiatric Risk Score Assessment**  
Najme Soleimani, Vince D. Calhoun  
TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States  
Poster Board Number: 176

ID: 6688  
**Vibratory Feedback on the Forearm Is Less Preferred but Similarly Effective as Fingertips for Fine Motor Task in Augmented Reality**  
Matthew Fifer, Neha Thomas, Courtney Moran, Luke Osborn, Breanne Christie  
Johns Hopkins University, Applied Physics Lab, United States  
Poster Board Number: 177

ID: 7040  
**Improvement of Dynamic Phosphene Presentation for a Cortical Visual Prosthesis Is Task-Specific**  
Haozhe Zac Wang, Yan Tat Wong  
Monash University, Australia  
Poster Board Number: 178
Technical Program – Tuesday, July 16th

ID: 7176
Muscle Activation of Lower Limb During Walking in Elderly Individuals with Sarcopenia: A Pilot Study
Yongjin Li{1}, Binbin Wang{1}, Xin Jiao{2}, Mirabel Ewura Esi Acquah{1}, Yunxia Zhu{3}, Jun Jin{3}, Xiaoyan Zhang{3}, Dongyun Gu{2}
{1}Shanghai Jiao Tong University, Ghana; {1}Shanghai Jiao Tong University, China; {2}Shanghai Ninth People’s Hospital, Shanghai Jiao Tong University School of Medicine, China; {3}Shanghai Sixth People’s Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, China
Poster Board Number: 179

ID: 7315
Exploring Virtual Reality-Based Training’s Effects on Balance Ability and Balance Confidence in Older Adults
Oshin Wilson, Frank Borris III, Bridget Thorpe, Aliya Newby, Younes Elhakour, Brian Douglas, J’Niya Butler, Roni Romero Melendez, Chibodum Azikiwe, Nicole Arnold, Lara A. Thompson
University of the District of Columbia, United States
Poster Board Number: 180

ID: 7512
The Haptic Metronome: A Study on Steady Tempo
Daniel Mead, Kyle Reed, Adila Hoque
University of South Florida, United States
Poster Board Number: 181

ID: 7540
Magnifying Facial Micro-Movements for Cognitive Evaluation
Raffaele Mineo{2}, Federica Proietto Salanitri{2}, Lisa Passarello{2}, Alberto Sardella{2}, Laura Messina{1}, Manuela Pennisi{2}, Daniela Giordano{2}, Simone Palazzo{2}, Concetto Spampinato{2}
{1}Klinikos Center for Psychodiagnosistics and Psychotherapy, Italy; {2}Università degli Studi di Catania, Italy
Poster Board Number: 182

ID: 8024
Effects of Modulation Method and Presentation Part on Distantly-Presented Bone-Conducted Ultrasonic Perception
Naoya Takahashi, Sho Otsuka, Seiji Nakagawa
Chiba University, Japan
Poster Board Number: 183

ID: 6979
Study on the Temporal Patterns of CA1 Pyramidal Neuron Activity in Mice Hippocampus Under Simulated Spaceflight Composite Environment
Shufan Sun, Jing Ren, Meiling Zhao, Ling Wang, Chenguang Zheng, Jiajia Yang, Dong Ming
Tianjin University, China
Poster Board Number: 184
ID: 7272
**Event-Related Potentials in Complex and Simple Words-Pseudowords Aloud Reading Task**
Pietro Tarchi, Federico Calà, Lorenzo Frassineti, Antonio Lanatà
Università degli Studi di Firenze, Italy
Poster Board Number: 185

ID: 7435
**Analysis of Synchronization Component Dynamics During a Cooperative Group Task as Assessed by Electroencephalography**
Alex Kennedy, Alejandro Lopez Valdes
Trinity College Dublin, Ireland
Poster Board Number: 186

ID: 6189
**A Closed-Loop Micropump and Flow Meter for High-Precision Drug Delivery in an Implantable Neural Probe**
Mohammad Makhdoumi Akram, Amir Aghajani, Wei Shi, Benoit Gosselin
Université Laval, Canada
Poster Board Number: 187

ID: 6514
**Simultaneous High-Density 512-Channel SiNAPS Electrical Recordings and Optogenetics**
Gabor Orban, Alberto Perna, Matteo Vincenzi, Alessandro Caltabiano, Luca Nava, Raffaella Tonini, Gian Nicola Angotzi, João Filipe Ribeiro, Luca Berdondini
Fondazione Istituto Italiano di Tecnologia, Italy
Poster Board Number: 188

ID: 6912
**Percutaneous Connector for Large Animal, In Vivo Studies, with Open-Source Designs**
Jacinta Cleary, Orsolya Kékesi, Gregg Suaning
University of Sydney, Australia
Poster Board Number: 189

ID: 7102
**Agarose Phantoms for Insertion Characterization of Amorphous SiC Microelectrode Probes in Rat Brain Tissue**
Mahasty Khajehzadeh{2}, Shreya Tirumala Kumara{2}, Negar Geramifard{2}, Teresa Thai{1}, Ana Guadalupe Hernandez-Reynoso{2}, Joseph J. Pancrazio{2}, Stuart F. Cogan{2}
{1}University of Pittsburgh, United States; {2}University of Texas at Dallas, United States
Poster Board Number: 190

ID: 7181
**Antioxidant Coated Microelectrode Arrays: Effects on Putative Inhibitory and Excitatory Neurons**
{1}Case Western Reserve University, United States; {2}University of Texas at Dallas, United States
Poster Board Number: 191
An Impedance Model to Estimate the Effective Active Area of Neuro-Electrode for Quality Control
Louis Regnacq{1}, Arianna Ortega Sanabria{2}, Anil K. Abbas{2}, James J. Abbas{2}, Olivier Romain{1}, Yannick Bornat{3}, Florian Kölbl{3}, Ranu Jung{2}
{1}ETIS Lab, CY Cergy Paris University, ENSEA, CNRS, France; {2}I3R, University of Arkansas, United States; {3}IMS Laboratory, University of Bordeaux, Bordeaux INP, France
Poster Board Number: 192

Stability Assessment of Ultramicroelectrode Arrays in Neural Stimulation: An Electrochemical Impedance Spectroscopy Analysis
Qiwei Dong{2}, Cynthia Eluagu{2}, Yupeng Wu{3}, Jamille Hetke{1}, Stuart F. Cogan{3}, Mark E. Orazem{2}, Kevin J. Otto{2}
{1}NeuroNexus, United States; {2}University of Florida, United States; {3}University of Texas at Dallas, United States
Poster Board Number: 193

Design, Fabrication, and Implantation of Hollow Tissue-Engineered Electronic Nerve Interfaces
Bassam M. Smadi, Kenneth Fluker Jr., Ladan Jiracek-Sapieha, Caroline M. Pagac, Laurie M. Griffith, Jack W. Judy
University of Florida, United States
Poster Board Number: 194

A Compact Sub-Scalp Device for Powering Brain Implants
Jeremiasz Dados, Rylee Faherty, Gabrielle Summers, Han Wu, Kaitlyn Burstiner, Adam Khalifa
University of Florida, United States
Poster Board Number: 195

A Method for Minimally-Invasive Injection of Wireless Microdevices Into Brain Tissue
Cassandra Acebal{2}, Gurleen Kainth{2}, Harry Villanueva{2}, Ava Hajjar{2}, Valery Fuhrer{2}, Paul Wanczuk{2}, Alexander S. Lim{2}, Shriya Srinivasan{1}, Kevin J. Otto{2}, Adam Khalifa{2}
{1}Harvard University, United States; {2}University of Florida, United States
Poster Board Number: 196

Fabrication of Microelectrodes on Microchip Sidewalls for Injectable Biomedical Devices
Shiva Sai Yeshala, Sultan Mahmud, Nicholas G. Rudawski, Ladan Jiracek-Sapieha, Kenneth Fluker Jr., Jack W. Judy, Adam Khalifa
University of Florida, United States
Poster Board Number: 197
ID: 8029
Leakage Current Measurements of Amorphous Silicon Carbide Encapsulation for Implantable Microelectrode Arrays
Christopher Nguyen{2}, Alexandra Joshi-Imre{2}, Sandeep Negi{1}, Stuart F. Cogan{2}
{1}Blackrock Neurotech, University of Utah, United States; {2}University of Texas at Dallas, United States
Poster Board Number: 198

Tuesday Poster Session - Neural Stimulation, Prosthesis, & Control
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 7239
Effects of Auricular Hematoma on Propagation Components of Cartilage Conduction
Akane Tamura, Sho Otsuka, Seiji Nakagawa
Chiba University, Japan
Poster Board Number: 199

ID: 7492
On the Spatial Synaptic Propagation of Excitations Induced by Repetitive Microstimulation Pulses in the Mouse Visual Cortex
Santa Fukuda{1}, Tomohiro Nomoto{2}, Tetsuya Yagi{2}, Yuki Hayashida{1}
{1}Mie University, Japan; {2}Osaka University, Japan
Poster Board Number: 200

ID: 7577
A Compact Electro-Tactile System for Braille Display
Po-Hsun Chu{2}, Hai-Yin Chen{2}, Lin Chou{2}, Yu-Ching Chen{2}, Kun-Jui Tsai{1}, Yu-Te Liao{2}
{1}Industrial Technology Research Institute, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan
Poster Board Number: 201

ID: 7743
Artificial Touch Feedback Using Microstimulation of Human Somatosensory Cortex to Convey Grip Force from a Robotic Hand
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Applied Physics Lab, United States; {3}Johns Hopkins University, Johns Hopkins Medicine, United States; {4}National Institutes of Health, United States
Poster Board Number: 202

ID: 8023
A Standardized Vibro-Tactile Sensory Feedback System for Upper-Limb Prostheses
Niloufar Besharat zad{2}, Tegan Thurston{1}, Sean Sylwester{2}, V John Mathews{2}
{1}Children’s Hospital of Philadelphia, United States; {2}Oregon State University, United States
Poster Board Number: 203
Technical Program – Tuesday, July 16th

ID: 6019
Compact Reversible Nerve Block System for Wearable Bioelectronics
Seong Ho Yeon, Christian Landis, Guillermo Herrera-Arcos, Hyungeun Song, Hugh Herr
Massachusetts Institute of Technology, United States
Poster Board Number: 204

ID: 6205
Probing the Impact of Inner Retinal Network Changes on Subretinal Electrical Stimulation Responses
{1}Fudan University, China; {2}University of New South Wales, Australia
Poster Board Number: 205

ID: 6351
Electric Field Modeling for Planning Individualized HD-tACS to Target DLPFC in the Aging Brain
Diego E. Arias, Kirstin-Friederike Heise
Medical University of South Carolina, United States
Poster Board Number: 206

ID: 6461
Effects of 15-Day -6° Head-Down Bed Rest and HD-tDCS on Cognitive Functions
Linlin Dong, Yufeng Ke, Xiaodong Zhu, Dong Ming
Tianjin University, China
Poster Board Number: 207

ID: 6512
Hepatic Neuromodulation Using Temporal Interference
Amparo Güemes{3}, Florian Matthieu Missey{2}, Ihor Sahalianov{1}, Eric Daniel Głowacki{1}, George G. Malliaras{3}, Adam Williamson{2}
{1}Brno University of Technology, Czech Rep.; {2}International Clinical Research Center, Czech Rep.; {3}University of Cambridge, United Kingdom
Poster Board Number: 208

ID: 6618
A Compact Dead-Zone-Free Multi-Channel Stimulation and Recording System for Precision Peripheral Nerve Modulation
Yanjie Xing{2}, Weihuang Chen{1}, Danlei Yu{2}, Xiang Gao{2}, Jieting Bao{2}, Kedi Xu{3}
{1}State Key Lab of Brain-Machine Intelligence, Zhejiang University, China; {2}Zhejiang University, China; {3}Zhejiang University, Qiushi Academy for Advanced Studies, China
Poster Board Number: 209
ID: 7249
Low Intensity Focused Ultrasound Stimulation Targeted on M1 Ameliorates Neuroinflammation in Hemi-Parkinsonian Rats
Chunchan Li, Tianyi Sun, Rong Liang, Zihui Yang, Weifan Yang, Wanzhe Li, Yiwei Yin, Guanglu Zhang, Ling Wang, Jiajia Yang, Feng He, Dong Ming
Tianjin University, China
Poster Board Number: 210

ID: 7600
Optogenetic Locus Coeruleus Stimulation Improves Pupil Size Tracking of Cortical State
Evan Weiss, Yuxiang Liu, Qi Wang
Columbia University, United States
Poster Board Number: 211

ID: 7606
Spinal Noradrenergic Alpha-2 Receptors Mediate the Antinociceptive Effects of Therapeutic Intraspinal Microstimulation
Javier Lucas-Romero, Maria Bandres, Jacob McPherson
Washington University in St. Louis, United States
Poster Board Number: 212

ID: 7621
Patient-Specific Electrical Stimulation to Effectively Suppress Seizures Using a Data-Driven Dynamical Network Model
Emily Reed{1}, Rachel June Smith{3}, Joon-Yi Kang{2}, Sridevi Sarma{2}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States; {3}University of Alabama at Birmingham, United States
Poster Board Number: 213

ID: 7642
Sensory-Targeted Intraspinal Microstimulation for Spinal Cord Injury Rehabilitation
Gerson Moreno Romero, Maria Bandres, Jacob McPherson
Washington University in St. Louis, United States
Poster Board Number: 214

ID: 7950
Computational Analysis of Light Diffusion and Thermal Effects During Transcranial Photobiomodulation
Alexander Guillen{3}, Dennis Truong{3}, Paula Faria{2}, Brian Pryor{1}, Luis De Taboada{1}, Abhishek Datta{3}
{1}Neurothera, United States; {2}Polytechnic Institute of Leiria, Portugal; {3}Soterix Medical, United States
Poster Board Number: 215
ID: 8001
**Enhanced Peripheral Motor Responses Mediated by Spatiotemporal Patterning of Optogenetic Nerve Stimulation**
Emma Moravec, Jordan Williams
*Marquette University and the Medical College of Wisconsin, United States*
Poster Board Number: 216

ID: 8053
**Performance of Closed-Loop DBS During Sleep in Patients with Essential Tremor**
Natalie Geigel, Aysegul Gunduz
*University of Florida, United States*
Poster Board Number: 217

ID: 6845
**A Novel Motor Unit-Driven Neuro-Musculoskeletal Model for Estimating Continuous Wrist Motion**
Yunfei Liu{2}, Haowen Zhao{2}, Yao Li{2}, Ge Gao{2}, Yuwen Ruan{1}, Xu Zhang{2}
{1}Penn State University, United States; {2}University of Science and Technology of China, China
Poster Board Number: 218

ID: 6867
**Investigation and Validation of Digital Trail Making**
Ethan Wong, Bailey Uitz, Garrit Strenge, Alina Mueller, Isabella Frenzilli, Erin Lynch, Eugene Tunik, Mathew Yarossi
*Northeastern University, United States*
Poster Board Number: 219

ID: 7208
**Exploring Sway Metrics of Intermittency in the Feedback Postural Control for Assessing Balance Impairment in Patients with Parkinson’s Disease**
{1}Istituto Italiano di Tecnologia, Italy; {2}North Carolina State University, United States; {3}Osaka Toneyama Medical Center, Japan; {4}Osaka University, Japan
Poster Board Number: 220

ID: 7392
**Biofeedback Training for Balance Ability Improvement: An Analysis of Short-Term Effects and Sensory Information Utilization**
Kohei Kaminishi{2}, Kotaro Debun{2}, Tsukasa Okimura{1}, Yuri Terasawa{1}, Takaki Maeda{1}, Jun Ota{2}
{1}Keio University, Japan; {2}University of Tokyo, Japan
Poster Board Number: 221
ID: 7482
**Gait Response to Rhythmic Cues: Influence of Adaptation Mechanisms and Entrainment Levels**
Adila Hoque, Seok Kim, Kyle Reed
*University of South Florida, United States*
Poster Board Number: 222

ID: 7972
**Separation of Fascicles for Motor Unit Separability in Reinnervated Muscles for Neuroprosthesis Application**
Lang Qin{1}, Siyu Wang{1}, Kiara Quinn{2}, Pierce Perkins{1}, Sami Tuffaha{2}, Nitish V. Thakor{1}
{1}Johns Hopkins University, United States; {2}Johns Hopkins Medicine, United States
Poster Board Number: 223

ID: 6633
**The Relationship Between Rubrospinal Tract Structure and Ankle Plantarflexor Muscle Stiffness in Children with Cerebral Palsy**
Shahla Azizi{1}, Meysam Mansouri{4}, Famoosh Dadashi{5}, Shokoofeh Parvin{4}, Saba Amiri{3}, Mehdi Mirbagheri{2}
{1}Eastern Mediterranean University, Cyprus; {2}Northwestern University, United States; {3}Shahid Beheshti University of Medical Science, Iran; {4}Tehran University of Medical Sciences, Iran; {5}University of Minnesota Twin Cities, United States
Poster Board Number: 224

ID: 6993
**Electrical Stimulation-Based Paradigm to Enhance Lower Limb Motor Imagery: Initial Validation in Stroke Patients**
Zhuolan Gui, Yuan Liu, Shiyin Qiu, Yujian Zhang, Kailun Dong, Dong Ming
*Tianjin University, China*
Poster Board Number: 225

ID: 7299
**A Neurofeedback System to Decrease Chronic Musculoskeletal Pain**
Anders Kruse Laursen{1}, Julie Brink Petersen{1}, Katrine Aagaard Gregersen{1}, Mads Kilstrup Fleckenstein{1}, Felipe Rettore Andreis{1}, Natalie Mrachacz-Kersting{2}, Sabata Gervasio{1}
{1}Aalborg University, Denmark; {2}Ludwigs-Universität Freiburg, Germany
Poster Board Number: 226

ID: 7640
**Exploring the Role of Asymmetric Auditory and Tactile Stimulation on Modulating Gait Kinetics**
Scott Bartlett, Seok Kim, Adila Hoque, Kyle Reed
*University of South Florida, United States*
Poster Board Number: 227
Technical Program – Tuesday, July 16th

ID: 7661
3D-Printed Electrode Fabrication for Functional Electrical Stimulation (FES): Prototyping Concentric Electrodes
Javier Sáez{3}, Francisco Saavedra{2}, Rodrigo Osorio{1}, Martin Westermeyer{1}, James FitzGerald{4}, Brian Andrews{4}, Pablo Aqueveque{1}
{1}Universidad de Concepción, Chile; {2}Universidad del Biobio, Chile; {3}University of Concepción, Chile; {4}University of Oxford, United Kingdom
Poster Board Number: 228

ID: 7672
Nonlinear Firing Dynamics in Spinal Interneurons May Delineate the Presence or Absence of Spinal Cord Injury-Related Neuropathic Pain
Avery Twyman, Maria Bandres, Jacob McPherson
Washington University in St. Louis, United States
Poster Board Number: 229

ID: 7695
Chronic Spinal Cord Injury Increases Spontaneous Intraspinal Neural Transmission and Spike Train Variability
Maria Bandres, Jacob McPherson
Washington University in St. Louis, United States
Poster Board Number: 230

Tuesday Poster Session - New Technologies in Robotics, Biomechanics & Human/Robot Interaction
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6305
Pneumatic Relaxation Oscillator with Passive Components for Continuous Toes Movement
Kiyohiro Araki{2}, Muhammad Wildan Gifari{1}, Modar Hassan{2}, Kenji Suzuki{2}
{1}SIGMA, University of Tsukuba and Institut Teknologi Sumatera, Japan; {2}University of Tsukuba, Japan
Poster Board Number: 231

ID: 6387
Switching Operative Coordinate System Using Intuitive Haptic Device for Alignment of Six-DOF Robot Arm
Ryoya Owada{2}, Satoshi Miura{2}, Takuya Takeda{1}, Katsushi Asami{1}
{1}Denso Corporation, Japan; {2}Tokyo Institute of Technology, Japan
Poster Board Number: 232

ID: 6433
Real-Time Control for Assisted Sit-to-Stand via Legged Robotic Helpers
Camillo Ordonez, Christian Hubicki
Florida A&M University – Florida State University, United States
Poster Board Number: 233
ID: 6902
**Assessing the Physical Impact of Supernumerary Limbs on a Human Subject: A Simulation Study**  
Chaerim Moon, Joohyung Kim  
*University of Illinois Urbana-Champaign, United States*  
Poster Board Number: 234

ID: 6298
**A Grasp Taxonomy for People with C5-7 Spinal Cord Injury**  
Andrew McPherson, Keilani Adachi, Yuri Gloumakov, Hannah Stuart  
*University of California, Berkeley, United States*  
Poster Board Number: 235

ID: 6350
**A Novel 6-DOF Parallel Continuum Robot with Enhanced Reachable Workspace and Range of Twisting**  
Yuhang Lei, Ming Jiang, Yusuke Sugahara, Yukio Takeda  
*Tokyo Institute of Technology, Japan*  
Poster Board Number: 236

ID: 6353
**Design of Custom Splint for Distal Radius Fractures in Children Through Generative Design, Finite Element Analysis and 3D Printing**  
Andrea Jimena Lozano Aguilar, Rosmy Leyla Postigo Yauce, Midori Sánchez Sifuentes  
*Pontificia Universidad Católica del Perú, Peru*  
Poster Board Number: 237

ID: 7461
**Attention Overload Virtual Reality Training System -Extension of Effective Attention Resources-**  
Kouta Suzuki{2}, Yukiko Iwasaki{1}, Nonoka Nishida{2}, Ayumu Tsuji{2}, Hiroyasu Iwata{2}  
{1}IRIM - CNRS, France; {2}Waseda University, Japan  
Poster Board Number: 238

ID: 7948
**Preliminary Validation of an Objective Fall-Risk Assessment for Individuals with Stroke**  
Kiran Karunakaran, Sai Pamula, Prasad Tendolkar, Peii Chen, Easter Selvan Suviseshamuthu  
*Kessler Foundation, United States*  
Poster Board Number: 239
Tuesday Poster Session - Robot-aided Surgery
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6471
Friends Across Time: Multi-Scale Action Segmentation Transformer for Surgical Phase Recognition
Bokai Zhang{2}, Jiayuan Meng{2}, Bin Cheng{2}, Dean Biskup{2}, Svetlana Petculescu{3}, Angela Chapman{1}
{1}Blue Grotto Labs, LLC, United States; {2}Blue River Technology, United States; {3}Independent Consultant, United States
Poster Board Number: 240

ID: 7077
Teleoperated Navigation of a Roboticely Steerable Guidewire Under Fluoroscopy in a Flow Environment
Timothy Brumfiel{2}, Sharan Ravigopal{2}, Namrata Unnikrishnan Nayar{2}, Mesum Zaidi{1}, Jaydev Desai{2}
{1}Georgia Institute of Technology, United States; {2}RoboMed Lab, United States
Poster Board Number: 241

ID: 7091
Shape Manipulation of Bevel-Tip Needles for Prostate Biopsy Procedures: A Comparison of Two Resolved-Rate Controllers
{1}Harvard Medical School, United States; {2}Johns Hopkins University, United States
Poster Board Number: 242

ID: 7739
Design and Development of a Universal Accessory for Instruments and Implants Navigation in Image-Guided Spine Surgeries
Nivash Kumar S, Suhail Ansari T A, Minhas Naheem, Bala Siva Surya Pattu Arun, Manojkumar Lakshmanan, Mohanasankar Sivaparakasam
Indian Institute of Technology Madras, India
Poster Board Number: 243

ID: 7925
Embedded Force Sensor with Deep Transformation Calibration for Interventional Soft Robots
Navid Masoumi{1}, Andres Ramos{1}, Tannaz Torkaman{1}, Javad Dargahi{1}, Jake Barralet{2}, Liane Feldman{2}, Amir Hooshiar{2}
{1}Concordia University, Canada; {2}McGill University, Canada
Poster Board Number: 244
ID: 7963  
**Robotic Assistance for Precise Spinal Injections: Development and Clinical Verification**  
Aswathaman Govindaraju, Keerthivasan S, Shyam A, Manojkumar Lakshmanan, Mohanasankar Sivaprakasam  
*Indian Institute of Technology Madras, India*  
Poster Board Number: 245

ID: 7967  
**Towards a Percutaneous Nephrolithotomy Ultrasound-Guided Robotic System for Renal Access**  
Jonathan Her{2}, Zhi Xiang Ong{2}, Foo Cheong Ng{1}, U-Xuan Tan{2}  
{1}Changi General Hospital, Singapore; {2}Singapore University of Technology and Design, Singapore  
Poster Board Number: 246

### Tuesday Poster Session - Robotic Orthoses & Prostheses

4:30:00 PM - 6:00:00 PM  
Room: Veracruz Hall

ID: 6377  
**Robotically Adjustable Kinematics in a Wrist-Driven Orthosis Eases Grasping Across Tasks**  
Erin Chang, Andrew McPherson, Hannah Stuart  
*University of California, Berkeley, United States*  
Poster Board Number: 247

ID: 6474  
**A Hand Exoskeleton with 3D-Printed Compliant Mechanisms to Assist Grasping**  
Kosuke Minamii, Masahiro Yoshikawa  
*Osaka Institute of Technology, Japan*  
Poster Board Number: 248

ID: 6928  
**Development of a Soft-Type Glove Capable of Customizing Finger Rehabilitation Exercises Considering Differences in Physique**  
Ritsuki Nishizawa{2}, Tetsuya Hasegawa{2}, Shouhei Shirafuji{1}, Jun Ota{2}, Arito Yozu{2}  
{1}Kansai University, Japan; {2}University of Tokyo, Japan  
Poster Board Number: 249

ID: 7829  
**Design and Preliminary Evaluation of a Novel Robotic System for Anterior Shoulder Reduction**  
Zhi Xiang Ong{2}, Shu Woan Lee{1}, Siang Hong Goh{1}, Jia Wei Tay{2}, U-Xuan Tan{2}  
{1}Changi General Hospital, Singapore; {2}Singapore University of Technology and Design, Singapore  
Poster Board Number: 250
ID: 7912
**A Neck Orthosis with Multi-Directional Stiffness for Resistance Training**
Santiago Price Torrendell{1}, Hideki Kadone{3}, Modar Hassan{2}, Yang Chen{1}, Kenji Suzuki{2}
{1}Artificial Intelligence Laboratory, University of Tsukuba, Japan; {2}University of Tsukuba, Japan; {3}University of Tsukuba, University of Tsukuba Hospital, Japan
Poster Board Number: 251

ID: 7998
**Preliminary Experimental Validation of a Cable-Driven Joint System for Custom Orthoses**
Jason Wiebrecht{1}, Jacob Strick{1}, Ryan Farris{2}, Jerzy Sawicki{1}
{1}Cleveland State University, United States; {2}Messiah University, United States
Poster Board Number: 252

ID: 6407
**Post-Paralysis Upper Facial Movement Restoration in Real Time Using Soft Actuators**
Stefania Konstantinidi, Baptiste Tankwa, Quentin De Menech, Thomas Martinez, Yoan Civet, Yves Perriard
École Polytechnique Fédérale de Lausanne, Switzerland
Poster Board Number: 253

ID: 7193
**Hip Hiking Gait Improvement with Electrohydraulic Robotic Knee: Preliminary Results**
Hيران Zhong, Siyuan Gao, Qining Wang
Peking University, China
Poster Board Number: 254

ID: 7346
**Preventing Cortical Breaches with Impact Analysis During Spinal Instrumentation Surgery**
Julie Gabriel{5}, Manon Bas Dit Nugues{5}, Charles-Henri Flouzat-Lachaniette{3}, Giuseppe Rosi{4}, Eric Wagnac{2}, Guillaume Haiat{1}, Yvan Petit{2}
{1}CNRS, France; {2}École de Technologie Supérieure, Canada; {3}Henri Mondor Hospital, France; {4}Paris Est Creteil University, France; {5}Paris Est Creteil University, CNRS, France
Poster Board Number: 255

ID: 6603
**Hip Exoskeleton Based Trans-Multi-Articular Gait Intervention: Preliminary Study on Achilles Tendon Rehabilitation**
Zilu Wang{1}, Zhihao Zhou{1}, Chenxi Zhang{1}, Tiatong Wang{1}, Heran Zhong{1}, Rongli Wang{2}, Ninghua Wang{2}, Qining Wang{1}
{1}Peking University, China; {2}Peking University First Hospital, China
Poster Board Number: 256

ID: 6705
**A Wearable Device for Ankle Impedance Estimation During Walking**
Keisuke Yagi
Ibaraki University, Japan
Poster Board Number: 257
Technical Program – Tuesday, July 16th

Tuesday Poster Session - Signal Processing in Movements, Gaits, & Controls
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6061
**FedAssist: Federated Learning in AI-Powered Prosthetics for Sustainable and Collaborative Learning**
Hunmin Lee, Ming Jiang, Qi Zhao
University of Minnesota Twin Cities, United States
Poster Board Number: 258

ID: 6501
**Efficient Electromyography-Based Typing System: Towards a Novel Approach to HCI Text Input**
Yi Wang{2}, Youhao Wang{2}, Ruilin Zhao{1}, Yue Shi{2}, Yingnan Bian{2}
{1}Amygdala Neuro Technologies (Shenzhen) Co., Ltd., China; {2}Enlight Medical Technologies (Shanghai) Co., Ltd., China
Poster Board Number: 259

ID: 6631
**Enhancing Myoelectric Prosthetic Control: Deep Learning Strategies for Continuous Arm Kinematics Estimation and Cross-Subject Model Transferability from EMG Data**
Hend ElMohandes{2}, Neamat ElGayar{2}, Nick Taylor{2}, Adrian Turcanu{2}, Dmitry Amelin{1}, Roman Ruff{1}
{1}Fraunhofer Institute for Biomedical Engineering IBMT, Germany; {2}Heriot-Watt University, U.A.E.; {2}Heriot-Watt University, United Kingdom
Poster Board Number: 260

ID: 6634
**Classification of Upper Limb Movements Based on a LSTM Model in Aquatic Rehabilitation**
Abu Bony Amin, Yeonsik Noh
University of Massachusetts Amherst, United States
Poster Board Number: 261

ID: 6876
**Chin EMG Scalogram-Based Deep CNN for OSA Screening**
Adil Rehman, Mostafa Moussa, Hani Saleh, Naoufel Werghi, Ali Khraibi, Ahsan Habib Khandoker
Khalifa University, U.A.E.
Poster Board Number: 262

ID: 7509
**Random Channel Ablation for Robust Hand Gesture Classification with Multimodal Biosignals**
Keshav Bimbraw{2}, Jing Liu{1}, Ye Wang{1}, Toshiaki Koike-Akino{1}
{1}Mitsubishi Electric Research Laboratories, United States; {2}Worcester Polytechnic Institute, United States
Poster Board Number: 263
Technical Program – Tuesday, July 16th

ID: 7603
A Gait Triaging Toolkit for Overlapping Acoustic Events in Indoor Home Environments
Kelvin Summoogum\{1\}, Debayan Das\{2\}, Parvati Jayakumar\{2\}, Ismael Essop\{1\}
\{1\}Greenwich University, United Kingdom; \{2\}MiiCare, United Kingdom
Poster Board Number: 264

Tuesday Poster Session - Technology for Women & Children's Health/Equity & Access for Well-health
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 8086
Effect Investigation of Mask on Facial Expression Recognition Using Cerebral Evoked Potentials
Baijun Song, Tomohiko Igasaki, Saori Nishikawa
Kumamoto University, Japan
Poster Board Number: 265

Tuesday Poster Session - Therapeutic Devices & Systems 2
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6104
Civilian “Stun” Guns: Neural or Aural Stimulation?
Mark Kroll\{1\}, Hugh Pratt\{4\}, Klaus Witte\{7\}, Richard Luceri\{3\}, Dorin Panescu\{2\}, Michael Brave\{6\}, Christopher Andrews\{5\}
\{1\}Axon Enterprise, Inc., California Polytechnic State University, San Luis Obispo, United States; \{2\}BIOTRONIK CRC EP, Inc., United States; \{3\}College of the Holy Cross, United States; \{4\}CPLSO, United Kingdom; \{5\}Independent Consultant, Australia; \{6\}LAAW International, Inc., United States; \{7\}Universitätsklinikum Aachen, Germany
Poster Board Number: 266

ID: 6185
Development of an Electro-Pneumatic Calf Muscle Actuator to Estimate Peripheral Venous Oxygen Saturation Using Photoplethysmography
Idoia Badiola\{2\}, Stefan Noppeney\{1\}, Vladimir Blazek\{2\}, Steffen Leonhardt\{2\}, Markus Lueken\{2\}
\{1\}RWTH Aachen University, Germany; \{2\}RWTH Aachen University, Helmholtz-Institute for Biomedical Engineering, Germany
Poster Board Number: 267

ID: 6262
Intraoperative Multi-Sensor Tissue Differentiation in (Uro-)Oncology - A Short Review
Carina Veil, Oliver Sawodny
Universität Stuttgart, Germany
Poster Board Number: 268
ID: 6303
Assessment of Lumbar Muscles Activation in Patients with Unilateral Myofascial Pain Syndrome Based on High-Density Surface Electromyography: A Preliminary Study
Na Li, Qian Wang, Shaolong Ai, Hongchen He, Jiayuan He, Ning Jiang
West China Hospital of Sichuan University, China
Poster Board Number: 269

ID: 6315
Detecting the Intention of Sit-to-Stand by Analyzing Reaction Forces on the Foot with Pareto Optimum
Ming Jiang, Jian Zheng, Qizhi Meng, Yusuke Sugahara, Yukio Takeda
Tokyo Institute of Technology, Japan
Poster Board Number: 270

ID: 6380
A Three-Layer Tissue-Mimicking Phantom for Radiofrequency Skin Treatment
Yiyou Ma, Nianou Wang, Jingfeng Bai, Xiang Ji
Shanghai Jiao Tong University, China
Poster Board Number: 271

ID: 6410
Neural Networks-Based Approach to Solve Inverse Kinematics Problems for Medical Applications
Anna Korol{2}, Taras Rodzin{1}, Kateryna Zabava{1}, Valeriya Gritsenko{2}
{1}Ukrainian Catholic University, Ukraine; {2}West Virginia University, United States
Poster Board Number: 272

ID: 6420
Numerical Evaluation of the Voltage Induced on Pacemakers and Implantable Defibrillators by Wireless Power Transfer Systems for Automotive
Cecilia Vivarelli{1}, Eugenio Mattei{1}, Federica Censi{1}, Giovanni Calcagnini{1}, Fabio Freschi{2}, Luca Giaccone{2}, Aldo Canova{2}
{1}Italian National Institute of Health, Italy; {2}Politecnico di Torino, Italy
Poster Board Number: 273

ID: 6430
NeuroKinect4K: A Novel 4K RGB-D-IR Video System with 3D Scene Reconstruction for Enhanced Epileptic Seizure Semiology Monitoring
Tamás Karácsony{2}, Nicholas Fears{3}, Christian Vollmar{3}, Denise Birk{3}, Jan Rémi{3}, Soheyl Noachtar{3}, João Paulo Silva Cunha{1}
{1}INESC TEC, FEUP, Portugal; {2}INESC TEC, FEUP, CMU, Portugal; {3}Ludwig-Maximilians-Universität München, Germany
Poster Board Number: 274
ID: 6467
**A Sensitivity Analysis of Laser Thermotherapy Efficacy in Lung Cancer Treatment to the Temperature Dependence of Thermal Properties**  
*Pouya Namakshenas, Leonardo Bianchi, Paola Saccomandi*  
*Politecnico di Milano, Italy*  
*Poster Board Number: 275*

ID: 6513
**Automated Acoustic Analysis in Parkinson's Disease Using a Smartphone**  
*Gabriela T. Acevedo, Marc C. Pappas, Jackson G. Wolfe, Joshua Wong, Adolfo Ramirez-Zamora, Pamela R. Zeilman, Diego L. Guarin*  
*University of Florida, United States*  
*Poster Board Number: 276*

ID: 6527
**Thermal Response of Gold Nanorods-Loaded Polymeric Hydrogels Under NIR Laser Exposure for Biomedical Applications**  
*Leonardo Bianchi{2}, Alessandro Molinelli{2}, Elisa Lacroce{2}, Laura Polito{1}, Filippo Rossi{2}, Paola Saccomandi{2}*  
*{1}Consiglio Nazionale delle Ricerche SCITEC, Italy; {2}Politecnico di Milano, Italy*  
*Poster Board Number: 277*

ID: 6538
**Time-Resolved and Wash-Free Digital Immunoassay Based on Dynamic Tracking of Single Binding Events**  
*Tingting Zhan, Pengcheng Zhang, Yi Zhang, Hui Yang*  
*Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China*  
*Poster Board Number: 278*

ID: 6543
**Multiple Nucleic Acids Testing on a Low-Cost Digital Microfluidic Platform for Respiratory Bacteria (MNAT-DMF)**  
*Ruibin Xie, Jienan Shen, Hui Yang*  
*Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China*  
*Poster Board Number: 279*

ID: 6551
**Quantifying the Impact of Spinal Fusion Systems by Multibody Simulation**  
*Sabine Bauer, Ivanna Kramer, Dietrich Paulus*  
*Universität Koblenz, Germany*  
*Poster Board Number: 280*

ID: 6574
**Structural Mechanic Characteristics of Stable Cerebral Aneurysms**  
*Jozišef Nagy{1}, Wolfgang Fenz{4}, Julia Maier{2}, Stefan Thumfart{4}, Zoltan Major{2}, Andreas Gruber{3}, Matthias Gmeiner{3}*  
*{1}eulerian-solutions e.U., Austria; {2}Johannes Kepler University, Austria; {3}Kepler Universitätsklinikum, Austria; {4}RISC Software GmbH, Austria*  
*Poster Board Number: 281*
ID: 6635
**Tracking Progression of Schizophrenia Using a Resting-State fMRI Biomarker of Regional Interactions in the Brain Network**
Autumn Williams{1}, Luis Sanchez{1}, Sridevi Sarma{2}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States
Poster Board Number: 282

ID: 6650
**RehaBricks: An Electronic Modular Pegboard for Improving Upper Limb Exercise Adaptability**
Chang Liu{2}, Sho Mitarai{2}, Luciano H. O. Santos{1}, Sayaka Okahashi{3}, Goshiro Yamamoto{2}
{1}Fitting Cloud Inc., Japan; {2}Kyoto University, Japan; {3}National Center for Geriatrics and Gerontology, Japan
Poster Board Number: 283

ID: 6665
**Finite Element Analysis of a Bare Metal Stent Therapeutic for Aortic Dissection**
Xiaoxi Hou{1}, Francis Chikweto{5}, Yasuyuki Shiraishi{5}, Tomoyuki Yambe{5}, Haoran Wang{2}, Yi Qian{3}, Kazuhiko Hanzawa{4}
{1}Institute of Development, Aging and Cancer, Tohoku University, Japan; {2}Institute of Fluid Science, Tohoku University, Japan; {3}Monash University, Australia; {4}Niigata University, Japan; {5}Tohoku University, Japan
Poster Board Number: 284

ID: 6722
**Bladeless Dust Collection System to Prevent Scattering in Powder Feeding Process**
Nana Tsuruta{1}, Michihiro Hakoda{1}, Ken’ichi Yano{1}, Yohei Nagamitsu{2}, Yoshiyuki Hirayama{2}
{1}Mie University, Japan; {2}ROHTO Pharmaceutical Co., Ltd., Japan
Poster Board Number: 285

ID: 6771
**A Resting-State fMRI Network Biomarker for Autism Spectrum Disorder**
Veronica Kidwell{1}, Autumn Williams{1}, Luis Sanchez{1}, Sridevi Sarma{2}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States
Poster Board Number: 286

ID: 6828
**Toward Autonomous Marker Localization for Lumbar Epidural Steroid Injection Robot**
Depeng Liu{3}, Ruirui Huang{2}, Dimitri Lezcano{2}, Gang Li{1}, Iulian Iordachita{2}
{1}Children’s National Hospital, United States; {2}Johns Hopkins University, United States; {3}Shanghai Jiao Tong University, China
Poster Board Number: 287
Technical Program – Tuesday, July 16th

Tuesday Poster Session - Time-frequency, Time-scale & Nonlinear Dynamic Analysis
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6073
An Algorithm Study for FES Evoked Artifacts Removal Based on the Combination of CEEMDAN and GS
Bowen Xu{2}, Xueliang Bao{1}, Feiming Chen{1}, Yongqiang Nai{1}
{1}Ningxia University, China; {2}Ningxia University & Beijing Jiaotong University, China
Poster Board Number: 288

ID: 6076
Extended Recordings of Somatosensory-Evoked High-Frequency Oscillations as a Measurement of Arousal Levels in Rats
Mingfeng Cao{2}, Sunreet Khanna{1}, Prachi Agarwal{2}, Nitish V. Thakor{2}
{1}Indian Institute of Technology Kharagpur, India; {2}Johns Hopkins University, United States
Poster Board Number: 289

ID: 6354
Channel Stacking: A Rapid Classification Method for Parkinson’s Disease Based on EEG Data
Mingliang Zhang{2}, Timo Hamalainen{2}, Fengyu Cong{1}, Hang Liu{1}
{1}Dalian University of Technology, China; {2}University of Jyväskylä, Finland
Poster Board Number: 290

ID: 6486
Comparison of Quantitative EEG Features for the Prediction of Neurological Recovery After Cardiac Arrest in Rodents
Mingfeng Cao, Yinong Chen, Yunfan Zou, Yuxin Du, Nitish V. Thakor
Johns Hopkins University, United States
Poster Board Number: 291

ID: 6627
The Novel Estimation Algorithm of Heart Rate Variability and Stress Using Facial Video Analysis
Mavlonbek Khomidov, Jong-Ha Lee
Keimyung University, Korea
Poster Board Number: 292

ID: 6651
EEG Markers for Anticipated Difficulty of Future Visual Task
Zichen Song{1}, Hiroshi Higashi{2}, Shin Ishii{1}
{1}Kyoto University, Japan; {2}Osaka University, Japan
Poster Board Number: 293
ID: 6687
Baevsky's Stress Index as a Sensitive Indicator for Biofeedback Efficacy in Medical Students: A Pilot Study
Mohammed Khan, Rajan Prasad, Nadia Rabeh, Carl Kassab, Salma Aouda, Zakia Dimassi, Shiza Saleem, Herbert Franz Jelinek
Khalifa University, U.A.E.
Poster Board Number: 294

ID: 6963
Transient Events During Photic Driving in Single-Trial EEG Within the Second Harmonics
Hannes Oppermann, Jens Haueisen
Technische Universität Ilmenau, Germany
Poster Board Number: 295

ID: 7475
Estimating and Detecting Slow Wave Events in EEG
Zhenghao Xiong, Addison Schwamb, Ben Palanca, Shinung Ching
Washington University in St. Louis, United States
Poster Board Number: 296

ID: 7515
A Behavioral Model for Transcutaneous Carbon Dioxide Measurement Using Time-Correlated Single Photon Counting Technique
Isil Isiksalan{2}, Hakan Burak Karli{1}, Tuna Berk Tufan{2}, John Matthews{2}, Bige Deniz Unluturk{1}, Ulkuhan Guler{2}
{1}Michigan State University, United States; {2}Worcester Polytechnic Institute, United States
Poster Board Number: 297

ID: 7521
Human Gait Identification Using UWB Radar Micro-Doppler Signature
Maowen Yin, Charalambos Hadjipanayi, Alan Bannon, Timothy Constantinou
Imperial College London, United Kingdom
Poster Board Number: 298

ID: 6895
Synergistic Dynamics of Heart Rate Variability and Systolic Blood Pressure Revealed by Dual Poincaré Plot Analysis
Prachi Agarwal{1}, Yu Guo{2}, Payam Gharibani{1}, Poorna Prakash{3}, Nitish V. Thakor{1}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States; {3}Thomas Jefferson High School for Science and Technology, United States
Poster Board Number: 299

ID: 7449
Nonlinear Assessment of Gait Signal Complexity in Neurodegenerative Disorders
Radhayathri Udhayakumar{1}, Shivapratap Gopakumar{1}, Saiful Rahman{2}, Chandan Karmakar{2}
{1}Amrita Vishwa Vidyapeetham, India; {2}Deakin University, Australia
Poster Board Number: 300
ID: 7776
Latent Variable Double Gaussian Process Model for Decoding Complex Neural Data
Navid Ziaei{2}, Joshua Stim{1}, Melanie Goodman-Keiser{1}, Scott Sponheim{1}, Alik Widge{1}, Sasoun Krikorian{3}, Ali Yousefi{3}
{1}University of Minnesota Twin Cities, United States; {2}worcester polytechnic institute, United States; {3}Worcester Polytechnique Institute, United States
Poster Board Number: 301

Tuesday Poster Session - Wearable & Implantable Sensors & Systems
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 6045
Design of Future Wearable Glucose Biosensors
Parijat Deshpande, Dharmendr Kumar, Yogesh Badhe, Debankita De, Beena Rai
Tata Consultancy Services Limited, United States; Tata Consultancy Services Limited, India
Poster Board Number: 302

ID: 6056
Unsupervised Gait Assessments of Stroke Patients Using a Smartphone and Machine Learning
Jingyao Sun{2}, Tianyu Jia{2}, Kiensiau Lim{2}, Linhong Mo{1}, Linhong Ji{2}, Chong Li{2}
{1}Capital Medical University, China; {2}Tsinghua University, China
Poster Board Number: 303

ID: 6174
Channel Variability in Human Body Communication with External Objects in Body Resonance Region
Qi Huang, Samyadip Sarkar, Shreyas Sen
Purdue University, United States
Poster Board Number: 304

ID: 6218
Validating Room Location Within the Home for Functional Measures from Digital Health Technologies
Kate McLeish{2}, Derek Hill{2}, Jeremy Roche{2}, Wan-Tai Au-Yeung{1}, Jeffrey Kaye{1}
{1}Oregon Health & Science University, United States; {2}Panoramic Digital Health, France
Poster Board Number: 305

ID: 6338
Lightweight Neural-Network-Based Trajectory Estimation for Low-Cost Inertial Measurement Units
Shing Hin Hui{1}, Bor-Shyh Lin{2}, Hsin-Lung Wu{1}, Bor-Shing Lin{1}
{1}National Taipei University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan
Poster Board Number: 306
ID: 6452
**Quantification of Postural Sway During Pediatric Physical Therapy Using Wearable Inertial Measurement Units**
Henry Deaton{1}, Nayo Hill{3}, Amy Bastian{2}, Brian Jennison{1}, Jennifer Keller{2}
{1}Johns Hopkins University, United States; {2}Kennedy Krieger Institute, United States; {3}Kennedy Krieger Institute, Johns Hopkins Medicine, United States
Poster Board Number: 307

ID: 6493
**A New Perspective on Validation of Wearables for Stress Monitoring of Occupational Drivers**
Nina Van Oost{1}, Federica Masci{1}, An-Marie Schyvens{3}, Brent Peters{2}, Hélène Dirix{2}, Veerle Ross{2}, Geert Wets{2}, Johan Verbraecken{3}, An Neven{2}, Jean-Marie Aerts{1}
{1}Katholieke Universiteit Leuven, Belgium; {1}Katholieke Universiteit Leuven, Italy; {2}University Hasselt, Belgium; {3}University Hospital Antwerp, Belgium
Poster Board Number: 308

ID: 6526
**Hardware Accelerator for a Power Efficient Single-Lead Dry-Electrode ECG Wearable Design**
Abdelrahman Abdou, Sridhar Krishnan
Toronto Metropolitan University, Canada
Poster Board Number: 309

ID: 6530
**A TinyML Motion-Based Embedded Cough Detection System**
Maha S. Diab, Esther Rodriguez-Villegas
Imperial College London, United Kingdom
Poster Board Number: 310

ID: 6562
**HydroTrack: Spectroscopic Analysis Prototype Enabling Real-Time Hydration Monitoring in Wearables**
Nazim Belabbaci, Mohammad Arif Ul Alam
University of Massachusetts Lowell, United States
Poster Board Number: 311

ID: 6668
**Complexity Analysis Based on Parietal Fuzzy Entropy to Facilitate ADHD Diagnosis in Young Children**
I Wen Huang{1}, Yu-Ci Zheng{1}, I Jun Chen{2}, Li Wei Ko{1}
{1}National Yang Ming Chiao Tung University, Taiwan; {2}Ton Yen General Hospital, Taiwan
Poster Board Number: 312

ID: 6817
**Automatic Pain Detection Algorithm for Patients with Cancer Pain Using Wristwatch Wearable Devices**
Hideyuki Hirayama{2}, Shiori Yoshida{2}, Konosuke Sasaki{1}, Emi Yuda{2}, Kento Masukawa{2}, Mamiko Sato{1}, Tomoo Ikari{2}, Akira Inoue{2}, Yoshihide Kawasaki{2}, Mitsunori Miyashita{2}
{1}Nagoya University, Japan; {2}Tohoku University, Japan
Poster Board Number: 313
ID: 6900
**A Wearable System for Monitoring Neurological Disorder Events with Multi-Class Classification Model in Daily Life**
Yonghun Song{2}, Inyeol Yun{2}, Sandra Giovanoli{1}, Chris Awai Easthope{1}, Yoonyoung Chung{2}
{1}Lake Lucerne Institute, Cereneo Center, Switzerland; {2}Pohang University of Science and Technology, Korea
Poster Board Number: 314

ID: 6934
**HBC Transmission Policies for Energy Harvesting Empowered ECG Nodes**
Abeer Alamoudi, Abdulkadir Celik, Ahmed Eltawil
King Abdullah University of Science and Technology, Saudi Arabia
Poster Board Number: 315

ID: 7024
**In Vivo Assessment of Skin Hydration and Moisturisation Using a Multi-Wavelength Optical Sensing Wearable**
Iman Gidado, Meha Qassem, Panicos Kyriacou
City, University of London, United Kingdom
Poster Board Number: 316

ID: 7105
**Remote Co-Creation of Upper Limb Prostheses: Insights from a Feasibility Study**
Leen Jabban{2}, James Male{2}, Nicos Hadjigeorgiou{1}, Nicola Bailey{1}, Ben Ainsworth{3}, Benjamin Metcalfe{2}
{1}King’s College London, United Kingdom; {2}University of Bath, United Kingdom; {3}University of Southampton, United Kingdom
Poster Board Number: 317

ID: 7189
**Bi-Metal Metamaterial Absorber for Wearable Sweat Sensing and Energy Harvesting Applications**
Sultan Mahmud{2}, Erik Upol Biswas{1}, Sabbir Hossain Shawon{1}, Cameron Anderson{2}, Toshikazu Nishida{2}, Syeda Sarita Hassan{1}, Adam Khalifa{2}
{1}North South University, Bangladesh; {2}University of Florida, United States
Poster Board Number: 318

ID: 7277
**Classification of Abnormal Gaits with Machine Learning Algorithms Using Sensor-Inherited Insoles**
Beomjoon Park, Minhye Kim, Dawoon Jung, Daehyun Lee, Jinwook Kim, Kyung-Ryoul Mun
Korea Institute of Science and Technology, Korea
Poster Board Number: 319
ID: 7372
**An Arterial Pulse Signal Acquiring Wristwatch with Flexible Tactile Sensing Dense-Array**

Yi Sun{1}, Fang Wang{1}, Yue He{1}, Ke Sun{1}, Heng Yang{1}, Xinxin Li{1}, Xikun Zheng{2}, Jingqing Hu{2}

{1}Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China; {2}Xin-Huangpu Joint Innovation Institute of Chinese Medicine, China

Poster Board Number: 320

ID: 7427
**Exploring the Effects of Encapsulated Capacitive and Galvanic Transmitters for Implant-to-Wearable Scenarios in Human Body Communication**

Anyu Jiang{2}, Cassandra Acebal{2}, Brook Heyd{2}, Trustin White{2}, Gurleen Kainth{2}, Arunashish Datta{1}, Shreyas Sen{1}, Adam Khalifa{2}, Baibhab Chatterjee{2}

{1}Purdue University, United States; {2}University of Florida, United States

Poster Board Number: 321

ID: 7486
**Multimodal Biomedical Signal Acquisition Setup to Assess Chronic Pain in Older Adults with Alzheimer’s Disease**

Fernanda Souza Andrade{1}, Julie Ornelas{1}, Juyoung Park{2}, Gabriella Engstrom{1}, Richard D. Shih{1}, Hyochol Ahn{2}, Ilknur Telkes{1}

{1}Florida Atlantic University, United States; {2}University of Arizona, United States

Poster Board Number: 322

ID: 7503
**Low-Power Wearable Enabled by Extended Gate Field-Effect Transistors to Advance Vigilant Biochemical Sensing**

Hayley Richardson{1}, Brendan Thompson{1}, Kaila Peterson{1}, Tanner Songkakul{1}, Koji Sode{2}, Michael Daniele{1}, Alper Bozkurt{1}, Spyridon Pavlidis{1}

{1}North Carolina State University, United States; {2}University of North Carolina at Chapel Hill, United States

Poster Board Number: 323

ID: 7530
**Design Considerations of Peltier-Integrated Therapeutic Wrist Wrap for Medical Applications**

Kaleigh Ruiz, Samantha Ryan, Sarah Stutsman, Tanya Tirimala, Jatara Williams, Rashmi Wijesundara, Trevor Exley, Amir Jafari

University of North Texas, United States

Poster Board Number: 324

ID: 7543
**Towards Non-Invasive Swallowing Assessment: An AI-Powered Interface for Swallowing Kinematic Analysis Using High-Resolution Cervical Auscultation**

Yuewen Luo{2}, Ayman Anwar{2}, Siyi Ren{2}, James L. Coyle{1}, Ervin Sejdic{2}

{1}University of Pittsburgh, United States; {2}University of Toronto, Canada

Poster Board Number: 325
ID: 7594
**Performance of Regression-Based Models for Real-Time Estimation of Anterior Ground Reaction Forces During Walking**
Nelson Glover, Tiphanie Raffageau, Quentin Sanders
George Mason University, United States
Poster Board Number: 326

ID: 7644
**Innovative Approaches to Gender Classification Through Unsupervised Machine Learning and Multi-Activity Fusion**
Himesh Kahanda Koralege, Thang Ngo, Pubudu N. Pathirana, Bahareh Nakisa
Deakin University, Australia
Poster Board Number: 327

ID: 7741
**Cuff Electrode Impacts on Vagus Nerve Stimulation Threshold Under MR Gradient Coil Emission**
Lijian Yang{3}, Xiaolin Yang{3}, Ran Guo{3}, Jianfeng Zheng{3}, Hui Ye{1}, Norbert Kaula{2}, Ji Chen{3}
{1}Loyola University Chicago, United States; {2}Ncor, LLC, United States; {3}University of Houston, United States
Poster Board Number: 328

ID: 7898
**Optimization of Polymeric Microneedle Electrode for High-Quality EMG Recording**
Jinwoong Jeong, Yongwoo Kim, Sanghoon Lee
Daegu Gyeongbuk Institute of Science and Technology, Korea
Poster Board Number: 329

ID: 7970
**An Instant Tumor Detection Method for Ex-Vivo Tissue Palpation Utilizing Self-Learning High-Density Flexible Tactile Sensor Array Based on Attention Mechanism Neural Network**
Fang Wang{1}, Heng Yang{1}, Yue He{1}, Ke Sun{1}, Yi Sun{1}, Xikun Zheng{2}, Jingqing Hu{2}, Xinxin Li{1}
{1}Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China; {2}Xin-Huangpu Joint Innovation Institute of Chinese Medicine, China
Poster Board Number: 330

ID: 8004
**Comparison of Joint Axis Estimation Methods Using Inertial Measurement Units**
Seoyoong Hwang, Jonghyun Kim
Sungkyunkwan University, Korea
Poster Board Number: 331
ID: 8055
Development and Characterization of Zinc Dry Electrodes for Wearable Electrophysiology
Cassia Rizq, Alessandro D’Amico, Aidan Truel, Joelle Faybishenko, Min Suk Lee, Jeong-Hoon Kim, Gert Cauwenberghs, Virginia de Sa
University of California, San Diego, United States
Poster Board Number: 332

Students and Young Professionals: Reception
6:00:00 PM - 8:00:00 PM
Room: Coronado L
### Technical Program – Wednesday, July 17th

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<tr>
<th>Event</th>
<th>Time</th>
<th>Room</th>
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<tr>
<td><strong>Registration (Wednesday)</strong></td>
<td>8:00:00 AM - 6:00:00 PM</td>
<td>Central Registration Counter</td>
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<tr>
<td><strong>Speaker Ready Room (Wednesday)</strong></td>
<td>8:00:00 AM - 3:30:00 PM</td>
<td>El Paso 1-2</td>
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<tr>
<td><strong>Students and Young Professionals: Careers Panel</strong></td>
<td>8:30:00 AM - 10:00:00 AM</td>
<td>Cancun</td>
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<tr>
<td><strong>Next Generation Artificial Neural Network</strong></td>
<td>8:30:00 AM - 10:00:00 AM</td>
<td>Baja</td>
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</tbody>
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The limitations of the Perceptron algorithm commonly used in neural networks propose the incorporation of an evolutionary artificial Neuroidal network to overcome these limitations. While the traditional Artificial Neural Network (ANN) is effective for solving linearly separable classes, it fails to capture the complexities and non-linearity observed in biological neural networks. In contrast, a neuroid, designed to mimic the operation of human brain neurons, offers greater flexibility by introducing additional parameters beyond weights. Patient’s, Doctor’s, Health Care Industry, advancement of health information technology and artificial intelligence. Any time variant system can benefit from the Neuroid concept like FinTech (Market Trends), Weather Forecasting (Predicting Tornado’s, hurricanes’, temperature extremes), HealthCare (automatically informing healthcare authorities and police upon critical health crisis). Programmatically, Neuroid Networks are defined with three matrices, called chromosomes. Together, these are called the Network Genome. 1. N-Chromosome – defines how many neuroids there are & to what layer they belong. 2. C-Chromosome – defines the connections between neuroids. 3. V-Chromosome – defines the parameters (Umbr, β, etc.) for each individual neuroid. Genetic Algorithm: For this project, we are using a modified genetic algorithm to evolve more successfully trainable networks. The basic idea is to remove the worst performers from the population and use the best performers to create the next generation population.

Organizers: Chaitanya Kumar Mankala, Dr. Ricardo Jose Silva  
Villanova University, United States
Over the last two decades, microrobotic magnetic technologies have undergone impressive advances in the area of minimally invasive medicine. The use of magnetic fields has emerged as a compelling approach, enabling the wireless manipulation of magnetic devices, known as micro- and nanorobots, within the human body. Magnetic fields are attractive for their biocompatibility across a wide range of frequencies and magnitudes, as well as for their versatility in maneuvering objects. With a suitable design and specific magnetic inputs (i.e., gradients, rotating, or oscillating magnetic fields), magnetic tools can achieve different locomotion mechanisms. Magnetic technologies have also facilitated the activation of additional functionalities in magnetic micro- and nanorobots, such as magnetic hyperthermia for tissue cancer ablation, magnetoelectric stimulation of cells, enhanced diffusion of drugs and abrasion of tissues and blood clots. Our mini-symposium brings together leading experts to delve into various facets of this transformative field. Topics will span from advanced magnetic navigation systems to micro- and nanoscale tools designed for the transportation of therapeutic payloads, such as drugs and stem cells. We will also discuss the development of magnetically guided robotic catheters and endoscopes, as well as nanoscale actuators capable of wirelessly electrostimulating cell tissues. Particularly, we will explore how magnetic navigation systems can operate seamlessly in healthcare settings without requiring a complex infrastructure. The symposium will also discuss various designs for small magnetic robots, with an emphasis on biodegradability and biocompatibility, methods for tracking them inside the body, and strategies for efficiently controlling swarms of these devices. Additionally, we will show how advancements in materials can contribute to the development of dexterous robotic catheters that navigate through intricate blood vessels using magnetic navigation. The discussion will also touch on magnetic wearables and sensing technologies. Magnetic technologies go beyond the constraints of traditional methods, offering advancements in localized delivery, embolization, cell fertilization, and precise stimulation of difficult-to-reach damaged tissues. In this mini-symposium, we will uncover the potential of magnetic technologies and their pivotal role in shaping the future landscape of healthcare applications.

Organizers: Salvador Pané{2}, Denys Makarov{3}, Brad Nelson{2}, Li Zhang{5}, Hongsoo Choi{1}, Mariana Medina Sanchez{4}

{1}Daegu Gyeongbuk Institute of Science and Technology, Korea; {2}ETH Zürich, Switzerland; {3}Helmholtz-Zentrum Dresden-Rossendorf, Germany; {4}Leibniz-Institut für Festkörper- und Werkstoffforschung Dresden, Germany; {5}The Chinese University of Hong Kong, Hong Kong
Improving Medical Adherence Using Design for All - Part 1
8:30:00 AM - 10:00:00 AM
Room: Fiesta 5&6

This mini-symposium aims to explore the transformative power of electronic product information (ePI) in addressing non-adherence to prescribed treatments. Emphasis will be on digital adaptation to meet patient needs, ensuring actionable, tailored information. Discussions will include economic, societal, and behavioral obstacles to health, with experts from IHI projects GRAVITATE HEALTH AND BEAMER. Equity in healthcare, a complex concept influenced by diverse patient factors like age, health, social status, and living situations, will be a key topic. We'll delve into how algorithms can predict adherence behavior and how behavioral science and patient segmentation can enhance treatment adherence. The symposium will explore designing solutions that are accessible, inclusive, and user-friendly. A critical focus is on the ePI's adaptability to individual patient contexts, enhancing understanding and efficiency in information consumption. This involves summarizing content, using iconography, and demoting irrelevant information. Co-creation of solutions will involve healthcare professionals, academia, and the pharma industry, offering practical insights. Participants and students will engage by posing challenges related to non-adherence. The event aims to provide insights beneficial to the clinical and research communities. Session 1: “Understanding Non-Adherence and Equity in Healthcare” features speakers like Giuseppe Fico discussing “VBHC for All: Non-Adherence and Healthcare Equity,” Beatriz Merino on “Beyond Prescription: Adherence to Treatment,” and Nicholas William Chiccone on “Synergizing Patient Care and Pharma Industry.”

Organizers: Giuseppe Fico{2}, Beatriz Merino-Barbancho{1}, Nicholas William Ciccone{3}, Francisco Lupiañez-Villanueva{4}
{1}BEAMER project, Spain; {2}European Alliance of Medical and Biological Engineering and Science (EAMBES), Spain; {3}Novonordisk, Denmark; {4}PredictBy, Italy

NIH Special Session: Funding Opportunities and Grant Writing
8:30:00 AM - 10:00:00 AM
Room: Fiesta 7&8

If you are interested in applying for research grants from the National Institutes of Health (NIH), you don’t want to miss this special session. You will hear from experienced researchers and NIH program officials, who will share their advice and insights on how to navigate NIH grant space and write effective grant proposals. You will also learn about current funding opportunities from NIH program officers who will introduce their programs and priorities for the National Institute of Biomedical Imaging and Bioengineering, as well as other trans-NIH programs and opportunities. The session will be concluded by a Q&A segment where you can ask questions and interact with the panel members. The topics would benefit trainees, researchers, and investigators in all the career stages. The spectrum of the presentation and panel discussion covers all the themes of EMBC 2024. Some of the knowledge discussed in the session may be beneficial for grant writing and application beyond NIH opportunities.

Presenters: Qi Duan, Tiffani Lash, Sahana Kukke
NIH, United States
It is well recognized that sleep is a basic human need, crucial for our general health and well-being. The short-term effects of poor sleep quality include negative effects on our attention span, memory and learning ability. The longer-term effects are still being studied, but poor sleep quality or sleep deprivation has been linked to significant health problems and large economic costs due to lost productivity. Sleep disorders, such as sleep apnea, insomnia and short sleep duration, are all risk factors that adversely affect health and can lead to diseases such as high blood pressure, ischemic heart disease, stroke and diabetes. Even though polysomnography continues to be the most widely used technique to detect sleep disorders, portable devices and wearables are progressively becoming more accurate and widely accepted for monitoring sleep health. In parallel, (explainable) deep learning models are being integrated to enhance disease detection. Innovative models that combine Big Data with artificial intelligence while maintaining privacy are being developed. In this series of minisymposia, invited experts will present their recent contributions to specific areas in the informatics, diagnostics and therapeutics of sleep disorders, and discuss the issues that remain unresolved. This session focuses on recent developments in sleep informatics.

Organizers: Ralf Seepold{1} and Thomas Penzel{2}
{1}HTWG Konstanz—University of Applied Sciences, Germany; {2}Charite University Hospital, Germany
Movement impairments following a stroke are a major cause of adult disability in the world. According to the World Stroke Organization, there are over 101 million people who have experienced stroke and over 50% of them will live with permanent or chronic disability. Specific motor impairments include muscle weakness, spasticity, and a loss of fine motor control with the emergence of a highly stereotyped pattern of coarse, multi-joint movements (clinically known as abnormal synergy). Interventions to augment routine clinical practice for post-stroke rehabilitation have been developing rapidly over the past two decades. However, the benefit to movement rehabilitation in the chronic phase is still limited. This mini-symposium will discuss new non-invasive, non-pharmaceutical technologies that support motor recovery in the chronic phase. They have fewer side effects and/or risks than pharmaceutical (such as botulinum toxin) and invasive technologies (such as deep brain stimulation); therefore, they may allow future use in the community and home-based environment. This symposium will be co-chaired by Dr. Yuan Yang and Dr. Jinsook Roh, including the following speakers. Dr. Jinsook Roh from the University of Huston (USA) will discuss muscle synergy-guided human-machine interaction to improve motor coordination after stroke. Dr. Xiaoling Hu from the Hong Kong Polytechnic University (Hong Kong) will discuss a multi-modal rehabilitation system integrating exoskeletons, soft exo-muscles, exo-nerve stimulation, and tactile feedback to promote home-based rehabilitation. Dr. Hyung-soon Kim from the Korea Advanced Institute of Science & Technology (South Korea) will discuss soft wearable hand rehabilitation systems to improve motor function after stroke. Dr. Yuan Yang from the University of Illinois at Urbana-Champaign (USA) will introduce imaging- and computer-modeling-guided high-definition transcranial direct current stimulation (tDCS) to improve the upper extremity function in chronic stroke patients. A panel discussion on the current challenges in the field will follow to explore the potential of the future use of proposed technologies in the community and home-based environment to support stroke rehabilitation toward a long-term socioeconomic benefit in chronic stroke care and nursing.

Organizers: Jinsook Roh{3}, Xiaoling Hu{1}, Hyung-Soon Park{2}, Yuan Yang{4}
{1}Hongkong Polytechnic University, Hong Kong; {2}Korea Advanced Institute of Science & Technology, Korea; {3}University of Huston, United States; {4}University of Illinois Urbana Champaign, United States
Technical Program – Wednesday, July 17th

Activity, Gait, and Postures 1
8:30:00 AM - 10:00:00 AM
Room: Monterrey 1
Session Chair: Edward Sazonov and Nancey Trevanian Tsai, Md

ID: 6198
Concurrent Validity of Instrumented Insoles Measuring Gait and Balance Metrics in Parkinson's Disease
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States; {3}U.S. Department of Veterans Affairs, United States; {4}US Food and Drug Administration, United States; {5}US Food and Drug Administration, Health and Human Services, United States

ID: 6565
Fatigue Detection with Machine Learning Approaches Using Data from Wearable Devices
Karthis Gopalakrishnan{2}, Zhi Li{1}, Mehdi Boukhechba{1}, Elena Reynoso{1}, Kenneth Mosca{1}, Mark Morris{1}, Stefan Avey{1}
{1}Janssen Research & Development, LLC, United States; {2}Oregon State University, United States

ID: 6978
Gait Event Detection During Running Using a Bending Angle Sensor Attached to Loose-Fitting Clothing
Daisuke Goto, Yusuke Sakaue, Shima Okada, Naruhiro Shiozawa
Ritsumeikan University, Japan

ID: 7089
Automatically Classifying Vestibular Gait Using Time-Series Data from Wearable IMUs
Safa Jabri{2}, Lucy Spicher{2}, Wendy Carender{1}, Jenna Wiens{2}, Kathleen Sienko{2}
{1}Michigan Medicine, United States; {2}University of Michigan, United States

ID: 7252
Impact of Physical Activity on Quality of Life During Pregnancy: A Causal ML Approach
Kianoosh Kazemi{2}, Iina Ryhtä{2}, Iman Azimi{1}, Hannakaisa Niela-Vilén{2}, Anna Axelin{2}, Amir M. Rahmani{1}, Pasi Liljeberg{2}
{1}University of California, Irvine, United States; {2}University of Turku, Finland

ID: 7140
Precision Gait Analysis and Event Detection Using IMUs: A Comparative Evaluation with Insole Pressure Readings
Chrysoula Tsimperi{2}, Vassilis D. Tsakanikas{3}, Christophoros Papaioanou{2}, Efterpi Karapintzou{2}, Themis Exarchos{1}, Dimitrios I. Fotiadis{3}
{1}Ionian University, Greece; {2}University of Ioannina, Greece; {3}University of Ioannina, FORTH-BRI, Greece
| ID: 7559 | **Discrete Two-Degree-of-Freedom Control for Hemodynamic Optimization: Circulatory Simulation Study with Baroreflex Variability**  
{1}Circulatory System Research Foundation, Japan; {2}National Cerebral and Cardiovascular Center, Japan; {3}NTT Research, Inc., United States; {4}Tokyo Institute of Technology, Japan |
| ID: 7023 | **Evaluation of Valsalva Maneuver in Alpha-Synucleinopathies**  
Riccardo Asnaghi{1}, Costanza Scatà{2}, Angelica Carandina{2}, Eleonora Tobaldini{2}, Nicola Montano{2}, Manuela Ferrario{1}  
{1}Politecnico di Milano, Italy; {2}Università degli Studi di Milano, Italy |
| ID: 6133 | **Describing the Response of Cerebral Autoregulation to Postural Challenge via State Space Correspondence Methods**  
Alberto Porta{4}, Beatrice Cairo{3}, Vlasta Bari{4}, Francesca Gelpi{3}, Beatrice De Maria{1}, Davide Tonon{2}, Gianluca Rossato{2}, Luca Faes{5}  
{1}IRCCS Istituti Clinici Scientifici Maugeri, Milan, Italy; {2}IRCCS Sacro Cuore Don Calabria Hospital, Italy; {3}Università degli Studi di Milano, Italy; {4}Università degli Studi di Milano, IRCCS Policlinico San Donato, Italy; {5}Università degli Studi di Palermo, Italy |
| ID: 6656 | **The Impact of the Estimation Strategy of the Cerebral Critical Closing Pressure on the Autoregulation Index**  
Francesca Gelpi{2}, Vlasta Bari{3}, Beatrice Cairo{2}, Martina Anguissola{1}, Vittoria Mazzotta{1}, Pavandeep Singh{1}, Marco Ranucci{1}, Alberto Porta{3}  
{1}IRCCS Policlinico San Donato, Italy; {2}Università degli Studi di Milano, Italy; {3}Università degli Studi di Milano, IRCCS Policlinico San Donato, Italy |
| ID: 6233 | **Autonomic Dysfunction in REM Sleep Disorder: The Role of Respiration in HRV Analysis**  
{1}Scuola Superiore Studi Pavia IUSS, Italy; {2}Università degli Studi di Cagliari, Italy; {3}Università di Genova, Italy; {4}University of Zaragoza, Spain |
ID: 7107
**Investigating Ultra-Short-Term Heart Rate Variability as an Indicator of Craving in Recently Treated Patients with Opioid Use Disorder**
Vikram Abbaraju{2}, Syed Bashar{2}, Afra Nawar{2}, Farhan Rahman{2}, Jaiyoun Choi{1}, Tamara Lambert{2}, Asim Gazi{2}, Anna Harrison{2}, Madeline Robinson{2}, Hewitt Mesfin{1}, Trinity Gray{1}, Kellen Mermin-Bunnell{1}, Nora Jacquement{1}, Nikolina Tomic{1}
{1}Emory University, United States; {2}Georgia Institute of Technology, United States

**Brain Functional Imaging**
8:30:00 AM - 10:00:00 AM
*Room: Coronado B&C*
Session Chair: Vince D. Calhoun and Jie Luo

ID: 6084
**An Investigation of Changes in Hemispheric Functional Connectivity After Stroke Based on fNIRS**
Hongzhen Ruan{2}, Seadahmed Sharif Mahmoud{2}, Chi Sang Choy{1}, Qiang Fang{2}
{1}RMIT University, Australia; {2}Shantou University, Australia; {2}Shantou University, China

ID: 6230
**Enhancement of Functional Connectivity in Frontal-Parietal Regions After BCI-Actuated Supernumerary Robotic Finger Training**
Shuaifei Huang{2}, Yuan Liu{2}, Weiguo Xu{1}, Zhuang Wang{2}, Dong Ming{2}
{1}Tianjin Hospital, Tianjin University, China; {2}Tianjin University, China

ID: 6327
**Methodological Considerations in the Analysis of Acoustically Evoked Neural Signals: A Comparative Study of Active EEG, Passive EEG and MEG**
Nikola Kölbl, Konstantin Tziridis, Patrick Krauss, Achim Schilling
University Hospital Erlangen, Germany

ID: 6616
**Deciphering Odor Perception Through EEG Brain Activity and Gas Sensors**
Hsin-Ping Peng{1}, Hao-Lung Hsiao{1}, Chien-Hui Su{1}, Yang-Chen Lin{2}, Po-Chih Kuo{1}
{1}National Tsing Hua University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan

ID: 7544
**Functionally-Adaptive Gray and White Matter Structural Basis Sets via Dynamic Fusion of Multimodal MRI Data**
Marlena Duda{1}, Vince D. Calhoun{2}
{1}TReNDS Center, Georgia State University, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
### Brain Imaging Data Analysis
8:30:00 AM - 10:00:00 AM  
**Room: Yucatan 1**  
Session Chair: Fei He and Georgios Mitsis

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<th>ID</th>
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<td>6193</td>
<td>Explainable AI (XAI) for Neonatal Pain Assessment via Influence Function Modification</td>
<td>Md Imran Hossain, Ghada Zamzmi, Peter Mouton, Yu Sun, Dmitry Goldgof</td>
<td>University of South Florida, United States</td>
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<td>6679</td>
<td>Anomaly Detection in Pediatric and Adults Brain MRI with Generative Model</td>
<td>Chaojun Chen{2}, Khashayar Namdar{2}, Matthias Wagner{1}, Birgit Ertl-Wagner{1}, Farzad Khalvati{2}</td>
<td>{1}Hospital for Sick Children, Canada; {2}University of Toronto, Canada</td>
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<td>Exploring Schizophrenia Classification in fMRI Data: A Common Spatial Patterns(CSP) Approach for Enhanced Feature Extraction and Classification</td>
<td>M. Moein Esfahani, Robyn L. Miller, Vince D. Calhoun</td>
<td>TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States</td>
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<td>Revealing Fine-Grained Genetically Informed Cortical Parcellation Maps of Neonates Based on Multi-View Spectral Clustering</td>
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<td>{1}Northwest University, China; {2}University of North Carolina at Chapel Hill, United States</td>
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<td>7501</td>
<td>Bundle Analytics Based Data Harmonization for Multi-Site Diffusion MRI Tractometry</td>
<td>Bramsh Qamar Chandio{2}, Julio E. Villalón-Reina{2}, Talia Nir{2}, Sophia I. Thomopoulos{2}, Yixue Feng{2}, Sebastian Benavidez{2}, Neda Jahanshad{2}, Jaroslaw Harezlak{1}, Eleftherios Garyfallidis{1}, Paul M. Thompson{2}</td>
<td>{1}Indiana University Bloomington, United States; {2}University of Southern California, United States</td>
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<td>7563</td>
<td>Deep Normative Tractometry for Identifying Joint White Matter Macro- and Micro-Structural Abnormalities in Alzheimer’s Disease</td>
<td>Yixue Feng{3}, Bramsh Q. Chandio{1}, Julio E. Villalón-Reina{3}, Sebastian Benavidez{3}, Tamoghna Chattopadhyay{3}, Sasha Chehrzadeh{3}, Emily Laltoo{3}, Sophia I. Thomopoulos{3}, Himanshu Joshi{2}, Ganesan Venkatasubramanian{2}, John P. John{2}, Neda Jah</td>
<td>{1}Imaging Genetics Center, University of Southern California, United States; {2}Multimodal Brain Image Analysis Laboratory, National Institute of Mental Health and Neuro Sciences, India; {3}University of Southern California, United States</td>
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**Brain-computer & Brain-machine Interfaces 1**
8:30:00 AM - 10:00:00 AM  
*Room: Coronado A*  
Session Chair: Tianruo Guo and Srinivas Kota

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| 6027   | Enhancing Sleep Stage Classification with 2-Class Stratification and Permutation-Based Channel Selection | Luis Alfredo Moctezuma Pascual{2}, Yoko Suzuki{2}, Junya Furuki{2}, Marta Molinas{1}, Takashi Abe{2}  
{1}Norwegian University of Science and Technology, Norway; {2}University of Tsukuba, Japan |
| 6122   | Narrowband-Enhanced Method for Improving Frequency Recognition in SSVEP-BCIs | Ruxue Li{4}, Xi Zhao{2}, Zhenyu Wang{1}, Guiying Xu{1}, Honglin Hu{1}, Ting Zhou{3}, Tianheng Xu{1}  
{1}Shanghai Advanced Research Institute, Chinese Academy of Sciences, China; {2}Shanghai University, China; {3}Shanghai University, Shanghai Frontier Innovation Research, China; {4}ShanghaiTech University. Shanghai Advanced Research Institute, Chinese Academy of Sciences, China |
| 6188   | A Method of Cross-Subject Transfer Learning for Ultra Short Time SSVEP Classification | Hongzhuo Kang, Chaoyi Dong, Naqin Bao, Dongyang Lei, Huanzi Liu, Xiaoyan Chen  
Inner Mongolia University of Technology, China |
| 6200   | EEG Channel Localization and Selection via Training with Noise Injection for BCI Applications | Chun-Ming Huang{2}, Wei-Lin Lai{2}, Chih-Chyau Yang{2}, Yi-Jie Hsieh{2}, Chien-Ming Wu{2}, Chu-Hui Lee{1}  
{1}Chaoyang University of Technology, Taiwan; {2}Taiwan Semiconductor Research Institute, National Applied Research Laboratories, Taiwan |
| 6319   | EEG-Based Tension Recognition Annotated with Electrodermal Activity | Wei Gu{2}, Yun-Huan Li{1}, Li-Ming Zhao{1}, Wei-Long Zheng{2}, Bao-Liang Lu{2}  
{1}Shanghai Emotionhelper Technology Co., LTD., China; {2}Shanghai Jiao Tong University, China |
| 6333   | EEG Pattern Comparison and Classification Performance of Motor Imagery Between Supernumerary and Inherent Limbs | Zhuang Wang, Yuan Liu, Wenlai Wu, Shuaifei Huang, Xingwei An, Dong Ming  
Tianjin University, China |
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<td>Merat Rezaei{2}, Brian Guthrie{1}, Gregory J. Gerling{2}</td>
<td>{1}Cargill Corporation, United States; {2}University of Virginia, United States</td>
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<td>{1}Laboratory of Biomechanics and Biomedical Engineering, University of Patras, Greece; {2}University of Ioannina, Greece; {3}University of Ioannina, FORTH-BRI, Greece; {4}University of Patras, Greece</td>
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<td>7805</td>
<td>Investigation of the Significance of the Plaque Morphology Evolution in Plaque Rupture Events Using Computational Biomechanics</td>
<td>Dimitrios Pleouras{2}, Panagiotis Siogkas{2}, Vassiliki Potsika{2}, Vassilis D. Tsakanikas{3}, Sokratis Dimos{2}, Michalis Mantzaris{2}, Igor Koncar{1}, Dimitrios I. Fotiadis{3}</td>
<td>{1}University of Belgrade, Serbia; {2}University of Ioannina, Greece; {3}University of Ioannina, FORTH-BRI, Greece</td>
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<td>Sensitivity of Thoracolumbar Spine Musculoskeletal Model Loading in Neutral Standing and Forward Flexion Static Postures to Thoracic Disc Stiffness</td>
<td>Abdul Aziz Hulleck{2}, Muhammed Abdullah{2}, Dominika Ignasiak{1}, Rateb Katmah{2}, Abdelsalam Alkhalaileh{2}, Navid Arjmand{3}, Kinda Khalaf{2}, Marwan El Rich{2}</td>
<td>{1}ETH Zürich, Switzerland; {2}Khalifa University, U.A.E.; {3}Sharif University of Technology, Iran</td>
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<td>Electrophysiological Modeling of Uterine Smooth Muscles Cells During Estrus</td>
<td>Mathias Roesler, Shawn Means, Leo Cheng, Alys Clark</td>
<td>University of Auckland, New Zealand</td>
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<td>Dynamic Insights Into Lower Urinary Tract Function: Exploring Intraindividual and Interindivitual Variability Through Personalized Mathematical Modeling</td>
<td>Mohamed Zaid{3}, Caleb Hendrick{3}, Elie Alhajjar{2}, John Yin{4}, Zachary Danziger{1}, Giovanna Guidoboni{3}</td>
<td>{1}Emory University, United States; {2}RAND Corporation, United States; {3}University of Maine, United States; {4}University of Wisconsin-Madison, United States</td>
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Knowledge-Infused LLM-Powered Conversational Health Agent: A Case Study for Diabetes Patients
Mahyar Abbasian, Zhongqi Yang, Elahe Khatibi, Pengfei Zhang, Nitish Nagesh, Iman Azimi, Ramesh Jain, Amir M. Rahmani
University of California, Irvine, United States

ID: 7771
Using Transfer Learning to Refine Object Detection Models for Blind and Low Vision Users
Aradhita Bhandari{1}, Gail Batutis{1}, Aryan Jain{1}, Mallory Sico{1}, Giles Hamilton-Fletcher{2}, Chen Feng{1}, Todd Hudson{2}, John-Ross Rizzo{2}, Kevin Chan{2}
{1}New York University, United States; {2}New York University, NYU Langone Hospitals, United States

ID: 7833
Predicting Donor Selection and Multi-Organ Transplantation Within Organ Procurement Organizations Using Machine Learning
Chelsea Tanchip, Mohammad Noaeen, Kamyar Kazari, Zahra Shakeri
University of Toronto, Canada

ID: 6226
Enhancing Model Generalizability in Parkinson's Disease Automatic Assessment: A Semi-Supervised Approach Across Independent Experiments
Gianluca Amprimo{2}, Giulia Masi{2}, Gabriella Olmo{2}, Claudia Ferraris{1}
{1}Consiglio Nazionale Delle Ricerche IEIIT, Italy; {2}Politecnico di Torino, Italy

ID: 6858
Personalised Speech-Based PTSD Prediction Using Weighted-Instance Learning
Alexander Kathan{3}, Shahin Amiriparian{2}, Andreas Triantafyllopoulos{2}, Alexander Gebhard{2}, Sabrina Milkus{1}, Jonas Hohmann{1}, Pauline Muderlak{1}, Jürgen Schottdorf{4}, Richard Musil{1}, Björn Schuller{2}
{1}Ludwig-Maximilians-Universität München, Germany; {2}Technische Universität München, Germany; {3}Universität Augsburg, Germany; {4}Zentrumspraxis Friedberg, Germany

ID: 6984
Time-Varying Compartmental Models with Neural Networks for Pandemic Infection Forecasting
Marianna Karapitta, Andreas Kasis, Charithea Stylianides, Kleanthis Malialis, Panayiotis Kolios
KIOS CoE, University of Cyprus, Cyprus
ID: 6204
**Three-Dimensional Computational Musculoskeletal Model for Estimating Force-Impedance Control During Dynamic Upper Extremity Movements**
Morteza Asgari, Dustin Crouch
*University of Tennessee, Knoxville, United States*

ID: 6544
**Enhanced Markerless Tracking of Infant General Movements in Standard Videos Through Lightning Pose Compared to DeepLabCut**
Manpreet Kaur{2}, Hamid Abbasi{2}, Sian Williams{2}, Malcolm Battin{1}, Thor Besier{2}, Angus McMorland{2}
{1}Auckland City Hospital, New Zealand; {2}University of Auckland, New Zealand

ID: 6487
**Estimating Model Parameters of a Mathematical Model for Hand Motion During Cylindrical Grasps**
Panagiotis Tsakonas{2}, Neil Evans{2}, Joseph Hardwicke{1}, Michael Chappell{2}
{1}Institute of Applied & Translational Technologies in Surgery, UHCW NHS Trust, United Kingdom; {2}University of Warwick, United Kingdom

ID: 6823
**All Muscle Activity Test and Evaluation (AMATE): An Analytical Tool to Assess Lower Limb Muscle Activation for Stroke Patients**
Xiyan Xiong{2}, Nan Gao{1}, Qing Zhang{2}, Xiao Ma{2}, Pavel Smirnov{2}, Duchun Zeng{3}, Junxiao Xue{2}, Chun Yang{1}, Feng Lin{2}
{1}Tsinghua University, China; {2}Zhejiang Lab, China; {3}Zhejiang Provincial People's Hospital, China

ID: 7548
**Validation of the Estimated Effect of Ankle Foot Orthoses on Spinal Cord Injury Gait Using Subject-Adjusted Musculoskeletal Models**
Sergio Galindo-Leon{4}, Inge Eriks-Hoogland{2}, Kenji Suzuki{3}, Diego Paez-Granados{1}
{1}SCAI Lab, ETH Zürich, Swiss Paraplegic Research, Switzerland; {2}Swiss Paraplegic Center, Switzerland; {3}University of Tsukuba, Japan; {4}University of Tsukuba, SCAI Laboratory, ETH Zürich, Switzerland

ID: 7342
**Using Backward Adjustment with Model Predictive Control for Adaptive Control of Nonlinear Soft Artificial Muscle**
Yujie Su{1}, Disheng Xie{1}, Jing Shu{1}, Junming Wang{1}, Rong Song{2}, Raymond Kai-Yu Tong{1}
{1}Chinese University of Hong Kong, China; {2}Shenzhen Campus of Sun Yat-sen University, China
Technical Program – Wednesday, July 17th

Novel Image Reconstruction Techniques
8:30:00 AM - 10:00:00 AM
Room: Yucatan 2
Session Chair: Jim Ji and Wilson Silva

ID: 6991
3D Image Reconstruction Using Force-Controlled Robot-Assisted Ultrasound Scanning
Anna Furman, Nick Rupprecht, Julian Sessner, Jörg Franke
Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

ID: 6321
3D System Matrix Recovery Based on Iterative Up-and-Down Sampling Super-Resolution Network in Magnetic Particle Imaging
Lizhi Zhang, Jintao Li, Zijian Tang, Diya Zhang, Yizhe Zhao, Xiaowei He, Hongbo Guo
Northwest University, China

ID: 6221
EDRAM-Net: Encoder-Decoder with Residual Attention Module Network for Low-Dose Computed Tomography Reconstruction
Temitope Emmanuel Komolafe{4}, Liang Zhou{2}, Wenlong Zhao{3}, Nizhuan Wang{1}, Tao Wu{3}
{1}Hongkong Polytechnic University, Hong Kong; {2}Jiading District Hospital Affiliated Shanghai University of Medicine & Health Sciences, China; {3}ShanghaiTech University of Medicine & Health Sciences, China; {4}University of Science and Technology of China, Shanghai University of Medicine & Health Sciences, China

ID: 6207
Comparing Inclusion Methods on Juxta-Pleural Into Lung Parenchyma
Rudy Gunawan{2}, Yvonne Tran{1}, Jinchuan Zheng{2}, Hung Nguyen{2}, Ann Carrigan{1}, Megan K. Mills{3}, Rifai Chai{2}
{1}Macquarie University, Australia; {2}Swinburne University of Technology, Australia; {3}University of Utah, United States

ID: 7707
Learning Disentangled Representation for Multidimensional MR Image Reconstruction
Ruiyang Zhao, Zepeng Wang, Fan Lam
University of Illinois Urbana-Champaign, United States

ID: 7944
Towards Personalized Inhalation Therapy by Correlating Chest CT Imaging and Pulmonary Function Test Features Using Machine Learning
Ethan O’connor{1}, Emmanuel Yangue{1}, Yu Feng{1}, Huimin Wu{2}, Chenang Liu{1}
{1}Oklahoma State University, United States; {2}University of Oklahoma Health Sciences Center, United States
Dr. Meltem Izzetoglu is an Associate Professor in the Electrical and Computer Engineering Department at Villanova University, Villanova, PA. She is also affiliated with The Saul R. Korey Department of Neurology at Albert Einstein College of Medicine, Bronx, NY. Dr. Izzetoglu has background in both electrical and biomedical engineering fields coupled with experience and interest in the design, development, and evaluation of portable and wearable bio-optical devices, signal conditioning algorithms, data analytics, and metrics for applications ranging from medical to basic science research. She has been involved in the translation of two medical devices from lab to field and clinical use. Some of her current projects include investigation of cognitive control of mobility in young and aging populations, assessment and enhancement of cognitive performance, detection and monitoring of cerebral hemorrhage and edema development, physical and digital optical head model designs, detection of neurological and neurodegenerative diseases and mental disorders, and monitoring of local tissue oximetry. Dr. Izzetoglu is a member of IEEE and fNIRS Society. She has authored numerous publications and led several federally and privately funded projects. She actively teaches courses and advises student research projects on bioinstrumentation and biomedical signal processing topics in graduate and undergraduate levels.
Plenary: Role of biomedical engineers towards ensuring healthy lives and universal health coverage, challenges in equity and access to health technologies
10:30:00 AM - 11:30:00 AM
Room: Coronado H-J

Adriana is a passionate Mexican biomedical engineer with 40 years of experience- striving for access to safe, affordable, quality and appropriate medical devices for all populations in need. She has led the Medical devices unit at the World Health Organization (WHO), since 2008. In WHO she has led the development of policies for medical devices, global data, innovative technologies, health technology assessment and health technology management. She is responsible for the development of the Medical Devices information system (MeDevIS) which integrates the WHO Priority Medical devices lists, including devices for prevention, diagnostics and treatment. She is Mexican Biomedical Engineer with postgraduate degree in Clinical Engineering in USA. Before joining WHO she was the founding and Director General of the National Centre for Health Technology Excellence (CENETEC) in the Ministry of Health in Mexico, where she had more than 15 years’ experience as clinical engineer in Private and public hospitals in Mexico. She has had honorary positions in national and international professional organizations.

Students and Young Professionals: Women in Biomedical Engineering Panel
11:30:00 AM - 1:00:00 PM
Room: Baja

Translating the State of Art in Brain Research to Clinical Care of Brain Disorders
11:30:00 AM - 1:00:00 PM
Room: Cancun

Our understanding of the human brain over the past decades has been greatly expanded, thanks to the multimodal and newly developed tools for neural recording and neuroimaging. However, this vast amount of knowledge has yet to be fully utilized in the clinical care of brain disorders. This panel brings together five speakers, consisting of neurosurgeons, neuroscientists and neural engineers, to share their perspectives on the state of art and challenges in translating the latest discoveries into better patient care.

Organizers: Han Yuan{2}, Sharona Ben-Haim{3}, Thomas Penzel{1}, Catie Chang{4}, Lei Ding{2}
{1}Charité University Hospital, Germany; {2}The University of Oklahoma, United States; {3}University of California San Diego, United States; {4)Vanderbilt University, United States
Summary: It is well recognized that sleep is a basic human need, crucial for our general health and well-being. The short-term effects of poor sleep quality include negative effects on our attention span, memory and learning ability. The longer-term effects are still being studied, but poor sleep quality or sleep deprivation has been linked to significant health problems and large economic costs due to lost productivity. Sleep disorders, such as sleep apnea, insomnia and short sleep duration, are all risk factors that adversely affect health and can lead to diseases such as high blood pressure, ischemic heart disease, stroke and diabetes. Even though polysomnography continues to be the most widely used technique to detect sleep disorders, portable devices and wearables are progressively becoming more accurate and widely accepted for monitoring sleep health. In parallel, (explainable) deep learning models are being integrated to enhance disease detection. Innovative models that combine Big Data with artificial intelligence while maintaining privacy are being developed. In this series of minisymposia, invited experts will present their recent contributions to specific areas in the informatics, diagnostics and therapeutics of sleep disorders, and discuss the issues that remain unresolved. This session focuses on the clinical implications of these advances. Rationale: This proposal continues the tradition of similarly themed minisymposia series on sleep that we have organized successfully for EMBC over the past 10 years. Year after year, these sessions have attracted considerable interest among EMBC attendees and fueled the impetus for subsequent discussions. The topics to be presented fall within the coverage of Theme 5: Cardiopulmonary Systems and Physiology-based Engineering.

Organizers: Michael Khoo{3}, Philip de Chazal{4}, Scott Sands{1}, Rami Khayat{2}
{1}Harvard University, United States; {2}University of California, Irvine, United States; {3}University of Southern California, United States; {4}University of Sydney, Australia

ID: 6110
**Stiffness Analysis of Meningiomas Using Neural Network-Based Inversion on MR Elastography**
Keni Zheng, Matthew Murphy, Emanuele Camerucci, Aaron Plitt, Xiang Shan, Yi Sui, Armando Manduca, Jamie Van Gompel, Richard Ehman, John III Huston, Ziying Yin
*Mayo Clinic, United States*
ID: 6707
**Adaptive High-Frequency Enhancement Network with Equilibrated Mechanism for MR Imaging**
Ye Liu{1}, Kaicong Sun{3}, Chong Li{2}, Qingneng Li{4}, Zhuoxu Cui{4}, Jing Cheng{4}, Dong Liang{5}
{1}Chinese Academy of Sciences, ShanghaiTech University, China; {2}Inner Mongolia University, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China; {3}ShanghaiTech University, China; {4}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {5}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, ShanghaiTech University, China

ID: 7001
**Leveraging Deep Learning Model for Computer Vision-Based Brain Tumor Classification in 3D MRI Brain Images**
Tsz Kin Wan, Kei Hang Katie Chan
City University of Hong Kong, Hong Kong

ID: 7618
**Physics-Driven Deep Learning Reconstruction of Frequency-Modulated Rabi-Encoded Echoes for Faster Accessible MRI**
Mahdi Saberi, Parker Jenkins, Micheal Garwood, Mehmet Akçakaya
University of Minnesota Twin Cities, United States

ID: 7650
**Joint Density Distributions of Dynamic Spatial Brain Networks Show Systematic Variations at Rest**
Krishna Pusuluri, Armin Iraji, Vince D. Calhoun
TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States

ID: 7979
**Identifying Canonical Multi-Scale Intrinsic Connectivity Networks in Infant Resting-State fMRI and Their Association with Age**
Prerana Bajracharya{2}, Ashkan Faghiri{2}, Zening Fu{3}, Vince D. Calhoun{3}, Sarah Shultz{1}, Armin Iraji{3}
{1}Emory University, United States; {2}TReNDS Center, Georgia State University, United States; {3}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States

**Bio & Bioelectric Sensors**
11:30:00 AM - 1:00:00 PM
Room: Monterrey 1
Session Chair: Baibhab Chatterjee and Rylie Greene

ID: 6674
**The Influence of Muscle Contraction Intensity on Electrical Impedance Myography**
Alfred Hülkenberg, Niko Strotmann, Amine Mokni, Steffen Leonhardt, Philip von Platen
RWTH Aachen University, Helmholtz-Institute for Biomedical Engineering, Germany
ID: 6708
**A Wearable and Wireless Instrumentation Patch for Measuring Surface Bioelectric Field Projections**
Weilun Li, Subhankar Bose, Shantanu Chakrabartty
Washington University in St. Louis, United States

ID: 6741
**Eco-Friendly Bioimpedance Muscle Phantom: PVA-Agar Hydrogel Mimicking Living Tissue at Low Frequencies**
Anna Bublex, Amalric Montalibet, Bertrand Massot, Claudine Gehin
INSA Lyon, France

ID: 7118
**Easily-Accessible Human Skin-Fat-Muscle Phantoms for Dependable In-Vitro Testing of Biomedical Devices**
Yonghee Chang{1}, Naveed Ahmed{2}, Kaiyuan Yang{1}
{1}Rice University, United States; {2}University of Texas at Austin, United States

ID: 7699
**Vampire Fuel Cell Optimization for Medical Implants**
Cong Ma{1}, Mirella Di Lorenzo{2}, Patrick Degenaar{1}, Elizabeth Gibson{1}
{1}Newcastle University, United Kingdom; {2}University of Bath, United Kingdom

ID: 7820
**Depth Sensing Capabilities of an Interoperative Impedance Sensing Probe**
Sophie Lloyd, Ethan Murphy, Zenia Valdiviezo, Ryan Halter
Dartmouth College, United States

**Brain Patterns & Networks from fMRI**
11:30:00 AM - 1:00:00 PM
Room: Coronado P&Q
Session Chair: Gaetano Valenza and Vince D. Calhoun

ID: 7797
**FMRI Data Analysis Preserving Map Variability via Unsupervised Object-Centric Learning**
Rui Jin, Seung-Jun Kim
University of Maryland, Baltimore, United States

ID: 7002
**Comparison of Message-Switched and Packet-Switched Communication Simulated on the Human Connectome**
Makoto Fukushima{1}, Kenji Leibnitz{2}
{1}Hiroshima University, Japan; {2}National Institute of Information and Communications Technology, Japan
ID: 7022  
**Age-Dependent Spatial Patterns of Brain Noise in fMRI Series**  
Andrea Scarciglia{1}, Vincenzo Catrambone{1}, Martina Bianco{1}, Claudio Bonanno{3}, Nicola Toschi{2}, Gaetano Valenza{1}  
{1}Research Center E. Piaggio, Università di Pisa, Italy; {2}Università degli Studi di Roma Tor Vergata, Italy; {3}Università di Pisa, Italy

ID: 7735  
**fMRINet: Repurposing the EEGNet Model to Identify Emotional Arousal States in fMRI Data**  
Daniel Agostinho, Miguel Castelo-Branco, Marco Simões  
Universidade de Coimbra, Portugal

ID: 6805  
**Copula Linked Parallel ICA Jointly Estimates Linked Structural and Functional MRI Brain Networks**  
Oktay Agcaoglu{1}, Rogers F. Silva{1}, Deniz Alaçam{1}, Sergey Plis{2}, Tülay Adalı{3}, Biozid Bostami{2}, Vince D. Calhoun{2}  
{1}TReNDS Center, Georgia State University, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States; {3}University of Maryland Baltimore County, United States

ID: 8069  
**A Cross-Feature Mutual Learning Framework to Integrate Functional Connectivity and Activity for Brain Disorder Classification**  
Min Zhao{2}, Rongtao Xu{2}, Dongmei Zhi{1}, Shan Yu{2}, Vince D. Calhoun{3}, Jing Sui{1}  
{1}Beijing Normal University, China; {2}Institute of Automation, Chinese Academy of Sciences, China; {3}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States

### Brain-computer & Brain-machine Interfaces 2  
11:30:00 AM - 1:00:00 PM  
Room: Coronado A  
Session Chair: Richard Reilly and Giulia Corniani

ID: 6384  
**Channel- and Label-Flip Data Augmentation for Motor Imagery-Based Brain–Computer Interfaces**  
Takayuki Hoshino{2}, Suguru Kanoga{3}, Atsushi Aoyama{1}  
{1}Keio University, Japan; {2}Keio University, National Institute of Advanced Industrial Science and Technology, Japan; {3}National Institute of Advanced Industrial Science and Technology, Japan

ID: 6469  
**Mapping Cognitive Engagement: EEG and Graph Theory Analysis of Brain Region Involvement in Supernumerary Robotic Finger Utilization**  
Rateb Katmah, Mohammad I. Awad, Aamna Al Shehhi, Mohd Khalil AbuHantash, Feryal A. Alskaifi, Abdul Aziz Hulleck, Herbert Franz Jelinek, Irfan Hussain, Kinda Khalaf  
Khalifa University, U.A.E.
ID: 6495  
**Role of Scalp EEG Brain Connectivity in Motor Imagery Decoding for BCI Applications**  
Fatemeh Delavari, Sabato Santaniello  
*University of Connecticut, United States*

ID: 6609  
**From Word Embedding to Reading Embedding Using Large Language Model, EEG and Eye-Tracking**  
Yuhong Zhang{1}, Shilai Yang{1}, Gert Cauwenberghs{2}, Tzzy-Ping Jung{2}  
{1}Brown University, United States; {2}University of California, San Diego, United States

ID: 6660  
**Enhancing Detection of SSVEP-Based BCIs Using Adjacent Frequencies Fusion Method**  
Wenhao Zhou{2}, Xi Zhao{2}, Ting Zhou{3}, Zhenyu Wang{1}, Tianheng Xu{1}, Honglin Hu{1}  
{1}Shanghai Advanced Research Institute, Chinese Academy of Sciences, China; {2}Shanghai University, China; {3}Shanghai University, Shanghai Frontier Innovation Research, China

ID: 6676  
**Motor Imagery Decoding from EEG Under Visual Distraction via Feature Map Attention EEGNet**  
Yiting Geng{1}, Banghua Yang{1}, Sixiong Ke{1}, Liang Chang{1}, Jiayang Zhang{2}, Yanyan Zheng{3}  
{1}Shanghai University, China; {2}University of Leeds, China; {3}Wenzhou People’s Hospital, China

**Brain-computer & Brain-machine Interfaces 5**  
11:30:00 AM - 1:00:00 PM  
*Room: Fiesta 5&6*  
*Session Chair: Yiwen Wang and Jack Judy*

ID: 6682  
**Passive BCI Towards Health and Safety in Industry: Forecasting Human Vigilance 5.5 S Ahead**  
Ettore Cinquetti{2}, Ilaria Siviero{2}, Fabio Babiloni{1}, Gloria Menegaz{2}, Silvia Francesca Storti{2}  
{1}Sapienza Università di Roma, Italy; {2}Università degli Studi di Verona, Italy

ID: 6713  
**Feasibility of Immersive Virtual Reality Feedback for Enhancing Learning in Brain-Computer Interface Control of Ambulation**  
Zahir Chaudhry, Ryan Baxter, Jonathan Fu, Po Wang, Won Joon Sohn, An Do  
*University of California, Irvine, United States*

ID: 6770  
**Benchmarking Motor Imagery Algorithms for Pediatric Users of Brain-Computer Interfaces**  
Brian Irvine{1}, Hatem Abou-Zeid{1}, Adam Kirton{2}, Eli Kinney-Lang{2}  
{1}University of Calgary, Canada; {2}University of Calgary, Alberta Children’s Hospital, Canada

ID: 7379  
**Dynamic Inverse Reinforcement Learning for Feedback-Driven Reward Estimation in Brain Machine Interface Tasks**  
Jieyuan Tan, Yiwen Wang  
*Hong Kong University of Science and Technology, Hong Kong*
ID: 7469
**Pupil Diameter Does Not Covary with Learning During Single-Session Neurofeedback Training**
Joana Silva, Elmeri Syrjänen, Elaine Astrand
Mälardalen University, Sweden

ID: 7520
**An Adaptive Superposition Point Process Model with Neuronal Encoding Engagement Identification**
Mingdong Li, Mingyi Wang, Yiwen Wang
Hong Kong University of Science and Technology, China

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**Cardiorespiratory Signal Processing**
11:30:00 AM - 1:00:00 PM
Room: Coronado F&G
Session Chair: Georgios Mitsis and Antonis Sakellarios

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ID: 6124
**Effect of Maternal Respiration on Fetal Heart Rate Variability**
Namareq Widatalla, Ahsan Habib Khandoker
Khalifa University, U.A.E.

ID: 7085
**Respiratory Sound Intensity as a Noninvasive Acoustic Biomarker in COPD**
Manuel Lozano-García{2}, Francesca Aguilar Paredes{2}, Caroline J. Jolley{1}, Raimon Jané{2}
{1}King’s College London, United Kingdom; {2}Universitat Politècnica de Catalunya, Spain

ID: 7382
**Facial Remote Photoplethysmography for Continuous Heart Rate Monitoring During Prolonged Cold Liquid Bolus Administration**
Mahdi Momeni{4}, Sophie Wuthe{1}, Michaela Bitten Mølmer{2}, Emilie Lübner Svendsen{2}, Mikkel Brabrand{2}, Peter Biesenbach{3}, Daniel Teichmann{4}
{1}Luebeck University of Applied Sciences, Germany; {2}Odense University Hospital, Denmark; {3}University Hospital of Southern Denmark Esbjerg, Denmark; {4}University of Southern Denmark, Denmark

ID: 7787
**Pulse Wave Velocity Estimation Using Photoplethysmogram-Based Limited Penetrable Weighted Visibility Graph Features**
Juan Manuel Vargas{2}, Mohamed Mouad Boularas{2}, Mohamed Bahloul{1}, Slah Aridhi{4}, Taous Meriem Laleg-Kirati{3}
{1}Alfaisal University, Saudi Arabia; {2}INRIA, France; {3}National Institute for Research in Digital Science and Technology, France; {4}Sensoria Analytics, France
ID: 7999
**Computer-Aided Lung Auscultation Screening and Radiographic Evaluation of Pediatric Pneumonia**
Annapurna Kala{1}, Daniel Chong{1}, Abdullah Baqui{1}, Salahuddin Ahmed{3}, Ashraf Islam{3}, Nabid Chowdhury{3}, Arunangshu Roy{1}, Eric McCollum{2}, Mounya Elhilali{1}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States; {3}Projahnmo Research Foundation, Bangladesh

ID: 6592
**Enhancing Wearable Based Real-Time Glucose Monitoring via Phasic Image Representation Learning Based Deep Learning**
Yidong Zhu, Nadia Aimandi, Mohammad Arif Ul Alam
University of Massachusetts Lowell, United States

**Clinical Engineering & Health Technology Management**
11:30:00 AM - 1:00:00 PM
Room: Coronado D&E
Session Chair: Colin Barry and Reza Avazmohammadi

ID: 6055
**Noninvasive Detection of Diabetes in Obstructive Sleep Apnea Based on Overnight SpO₂ Signal and Deep Learning**
Jingyuan You{2}, Juan Li{1}, Ruiji Yao{2}, Jiandong Gao{2}, Ji Wu{2}, Jingying Ye{2}
{1}Beijing Tsinghua Changgung Hospital, China; {2}Tsinghua University, China

ID: 6071
**Effective Diagnosis of Sleep Disorders Using EEG and EOG Signals**
Ritika Jain{2}, Ramakrishnan Angarai Ganesan{1}
{1}Indian Institute of Science, India; {2}Indian Institute of Technology Madras, South Africa

ID: 6192
**Exploration of Brain Tumor Localization with High-Density Electroceorticography**
Yihan Wu{1}, Tao Chang{3}, Siliang Chen{3}, Ning Jiang{2}, Qing Mao{3}, Yuan Yang{2}, Jiayuan He{2}
{1}National Clinical Research Center for Geriatrics, West China Hospital, Sichuan University, China; {2}West China Hospital of Sichuan University, China; {3}West China Hospital, Sichuan University, China

ID: 6516
**Predicting Early Deterioration in Lower Acuity Telehealth Patients Using Gradient Boosting**
Ricardo Ricci Lopes, Holly Chavez, Louis Atallah
Philips Healthcare, Brazil; Philips Healthcare, United States

ID: 6706
**Multi-Camera Hand Motion Analysis for Puncture Technique Training**
Zhe Li{1}, Aya Kanazuka{1}, Atsushi Hojo{1}, Yushin Hara{2}, Yukihiro Nomura{1}, Toshiya Nakaguchi{1}
{1}Chiba University, China; {1}Chiba University, Japan; {2}Inter Reha Co., Ltd., Japan
Technical Program – Wednesday, July 17th

ID: 7580
A Machine Learning Approach to Predict Same-Day Discharge After Angiography Procedures
Santiago Villafuerte{2}, Jairo A. Cadena{1}, Vladimir Trujillo{2}, Jorge E. Sabogal{1}, Victor M. García{2}, José Fernando Valencia{2}
{1}Angiografia de Occidente, Colombia; {2}Universidad de San Buenaventura, Colombia

Computational Modeling of Cardiorespiratory Function & Hemodynamics
11:30:00 AM - 1:00:00 PM
Room: Fiesta 1&2
Session Chair: Zhihui Wang and Riccardo Barbieri

ID: 6432
Investigating the Impact of Sickle Cell Disease on Red Blood Cell Transport in Complex Capillary Networks
Runxin Wu, Mohammed Shihab Kabir, George Truskey, Amanda Randles
Duke University, United States

ID: 7890
Left Ventricle Hemodynamics: Pre Versus Post Mitral Valve Prolapse Repair
Seyed Babak Peighambari{3}, Tanmay Mukherjee{3}, Emilio A. Mendiola{3}, Farhad R. Nezami{1}, Amr Darwish{2}, Dipan J. Shah{2}, Reza Avazmohammadi{3}
{1}Harvard Medical School, United States; {2}Houston Methodist Research Institute, United States; {3}Texas A&M University, United States

ID: 7941
Hemodynamics Comparison of an Hour-Long Rest and Activity State Data in a Human Coronary Digital Twin
Japneet Kaur Mavi, Cyrus Tanade, William Ladd, Justen Geddes, Nusrat Sadia Khan, Amanda Randles
Duke University, United States

ID: 6870
Reinforcement Learning for Heart Failure Treatment Optimization in the Intensive Care Unit
Cristian Drudi{2}, Moritz Fechner{1}, Maximiliano Mollura{2}, Alizée Pace{1}, Gunnar Rätsch{1}, Riccardo Barbieri{2}
{1}ETH Zürich, Switzerland; {2}Politecnico di Milano, Italy

ID: 7590
Real Time Automatic Risk Prediction in ICU Patients Treated with ECMO
Filipe Ribeiro{2}, Catarina Barata{2}, João Ribeiro{1}, João Sanches{2}
{1}Hospital de Santa Maria, Portugal; {2}Instituto Superior Técnico, Portugal
### Technical Program – Wednesday, July 17th

#### Deep Learning for Medical Image Analysis

**11:30:00 AM - 1:00:00 PM**  
**Room: Yucatan 1**  
**Session Chair: Mahsa Ranji and Ethan Murphy**

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<tr>
<td>6144</td>
<td><strong>Multi-Scale Self-Supervised Consistency Training for Trustworthy Medical Imaging Classification</strong></td>
<td>Bonian Han{1}, Cristian Moran{2}, Jeong Yang{2}, Young Lee{2}, Zechun Cao{2}, Gongbo Liang{2}</td>
<td>{1}Hangzhou Dianzi University, China; {2}Texas A&amp;M University-San Antonio, United States</td>
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<td>6264</td>
<td><strong>Fuzzy-Label Weighted Deep Learning Classification for CT Image Quality Evaluation</strong></td>
<td>Ee Ping Ong{1}, Ruchir Srivastava{1}, Wenbo Chen{2}</td>
<td>{1}Agency for Science, Technology and Research, Singapore; {2}GE Healthcare, China</td>
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<td>6498</td>
<td><strong>Feature Imitating Networks Enhance the Performance, Reliability and Speed of Deep Learning on Biomedical Image Processing Tasks</strong></td>
<td>Shangyang Min{2}, Hassan Bagher-Ebadian{1}, Tuka Alhanai{3}, Mohammad M. Ghassemi{2}</td>
<td>{1}Henry Ford Hospital, United States; {2}Michigan State University, United States; {3}New York University Abu Dhabi, U.A.E.</td>
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<td>6736</td>
<td><strong>Towards Case-Based Interpretability for Medical Federated Learning</strong></td>
<td>Laura Latorre{3}, Liliana Petrychenko{1}, Regina Beets-Tan{1}, Taisiya Kopytova{1}, Wilson Silva{2}</td>
<td>{1}Netherlands Cancer Institute, Netherlands; {2}Utrecht University, Netherlands; {3}Vrij Universiteit Amsterdam, Netherlands</td>
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<td>6974</td>
<td><strong>Visual In-Context Learning for Few-Shot Eczema Segmentation</strong></td>
<td>Neelesh Kumar, Oya Aran, Venugopal Vasudevan</td>
<td>Procter &amp; Gamble Co, United States</td>
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<td>7129</td>
<td><strong>Investigating the Robustness of Vision Transformers Against Label Noise in Medical Image Classification</strong></td>
<td>Bidur Khanal{2}, Prashant Shrestha{1}, Sanskar Amgain{1}, Bishesh Khanal{1}, Binod Bhattarai{3}, Cristian Linte{2}</td>
<td>{1}NepAI Applied Mathematics and Informatics Institute for Research, Nepal; {2}Rochester Institute of Technology, United States; {3}University of Aberdeen, United Kingdom</td>
</tr>
</tbody>
</table>
## ECG Signal Processing Methods & Applications

**11:30:00 AM - 1:00:00 PM**  
**Room: Coronado M&N**  
Session Chair: Ahsan Khandoker and Roneel Sharan

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<th>ID</th>
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<th>Authors</th>
<th>Institution</th>
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<tbody>
<tr>
<td>6179</td>
<td>Multichannel QRS Detection by Combinatorial Optimization</td>
<td>Bruce Hopenfeld</td>
<td>Seekuence Solutions, United States</td>
</tr>
<tr>
<td>6426</td>
<td>Semantic Segmentation of QRS Complex in 12-Lead ECG Signals</td>
<td>Mateus de Paula da Silva, Marly G. F. Costa, Diego Giovani A. Vieira, Cicero F. F. Costa Filho</td>
<td>Universidade Federal do Amazonas, Brazil</td>
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<tr>
<td>6304</td>
<td>A Hybrid Lossless ECG Compressor with Morphological Detection and QRS Prediction</td>
<td>Zijian Tang, Yongxiang Guo, Milin Zhang</td>
<td>Tsinghua University, China</td>
</tr>
<tr>
<td>7324</td>
<td>Crucial Events Identify Early Stage of Cardiac Autonomic Neuropathy Progression from ECG Signals</td>
<td>Sara Nasrat{1}, Korosh Mahmoodi{2}, Ahsan Habib Khandoker{1}, Paolo Grigolini{2}, Shiza Saleem{1}, Herbert Franz Jelinek{1}</td>
<td>{1}Khalifa University, U.A.E.; {2}University of North Texas, United States</td>
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<tr>
<td>6210</td>
<td>ECG Biometric Recognition Using Adaptive Bloom Filter-Based Template Construction</td>
<td>Tzu-Yun Lin, Yu-Hsin Yang, Jui-Kun Chiu, Shun-Chi Wu</td>
<td>National Tsing Hua University, Taiwan</td>
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<tr>
<td>7340</td>
<td>Identification of Mental Stress Granularity from Long-Term ECG Recordings Using Novel Complexity Analysis</td>
<td>Sara Nasrat{1}, Korosh Mahmoodi{2}, Ahsan Habib Khandoker{1}, Paolo Grigolini{2}, Shiza Saleem{1}, Herbert Franz Jelinek{1}</td>
<td>{1}Khalifa University, U.A.E.; {2}University of North Texas, United States</td>
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</tbody>
</table>

## Medical Image Processing: MRI, Ultrasound & CT

**11:30:00 AM - 1:00:00 PM**  
**Room: Fiesta 7&8**  
Session Chair: Ehsan Kazemivalipour and Miguel Coimbra

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<tr>
<th>ID</th>
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<th>Institution</th>
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<tr>
<td>6584</td>
<td>BrainFTFCN: Synergistic Feature Fusion of Temporal Dynamics and Network Connectivity for Brain Age Prediction</td>
<td>Zihan Ma, Ruonian Yang, Zhenqing Ding, Jianlong Hu, Heng Zhang, Xiaowei He, Yudan Ren</td>
<td>Northwest University, China</td>
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</tbody>
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ID: 8076
**Multi-Dataset Collaborative Learning for Liver Tumor Segmentation**
Ziyuan Zhao{1}, Renjun Cai{4}, Kaixin Xu{1}, Zhengji Liu{2}, Xulei Yang{1}, Jun Cheng{1}, Cuntai Guan{3}
{1}Agency for Science, Technology and Research, Singapore; {2}Hong Kong Polytechnic University, Hong Kong; {3}Nanyang Technological University, Singapore; {4}National University of Singapore, Singapore

ID: 7684
**Magnetic Resonance Elastography for Mechanical Modeling of the Human Lumbar Intervertebral Disc**
Emily Triolo{3}, Waiman Meinhold{1}, Efe Ozkaya{2}, Jun Ueda{1}, Mehmet Kurt{3}
{1}Georgia Institute of Technology, United States; {2}Icahn School of Medicine at Mount Sinai, United States; {3}University of Washington, United States

ID: 7173
**An Adaptive Image Segmentation Approach for Tumor Region Identification in Ultrasound Images**
Emmanuel Yangue{1}, Yuxuan Li{1}, Ashish Ranjan{2}, Chenang Liu{1}
{1}Oklahoma State University, United States; {2}University of Texas Southwestern Medical Center, United States

ID: 7844
**Ultrasound for Automated Classification of Full-Thickness Rotator Cuff Tendon Tears Using Deep Learning**
Shrimanti Ghosh, Banafsae Felfeliyan, Yuyue Zhou, Jessica Knight, Natasha Akhlaq, Jessica Küpper, Abhilash R. Hareendranathan, Jacob L Jaremko
University of Alberta, Canada

ID: 7260
**GANs-Guided Conditional Diffusion Model for Synthesizing Contrast-Enhanced Computed Tomography Images**
Yulin Yang{2}, Jing Liu{4}, Qingqing Chen{3}, Yinhao Li{2}, Xian-Hua Han{1}, Hongjie Hu{3}, Lanfen Lin{5}, Yen-Wei Chen{2}
{1}Artificial Intelligence Research Center, Yamaguchi University, Japan; {2}Ritsumeikan University, Japan; {3}Sir Run Run Shaw Hospital, Zhejiang University, China; {4}Zhejiang Lab, China; {5}Zhejiang University, China

**Motor Learning, Neural Control & Neuromuscular Systems**
11:30:00 AM - 1:00:00 PM
Room: Coronado B&C
Session Chair: Abbas James and Luke Osborn

ID: 6423
**Enhancing Motor Learning Performance by Incorporating Brain-to-Brain Coupling with Affective Interaction**
Feiyu Pan{2}, Tianyu Jia{2}, Jingyao Sun{2}, Annie Yan Wang{1}, Linhong Ji{2}, Chong Li{2}
{1}Hong Kong Polytechnic University, China; {2}Tsinghua University, China
Technical Program – Wednesday, July 17th

ID: 6742
Cortico-Muscular Information Transfer Based on fNIRS and sEMG During Gait Walking in the Elderly and Young Adults
Yanan Diao{3}, Guilan Chen{3}, Yue Sun{1}, Zijing You{4}, Shaofeng Zhao{2}, Yunkun Ning{3}, Guanglin Li{3}, Chuyao Jian{2}, Guoru Zhao{3}
{1}Chengdu University of Technology, China; {2}Eighth Affiliated Hospital of Sun Yat-Sen University, China; {3}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, United States; {4}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

ID: 6777
Identification of the Human Postural Sway Response to Visual Inputs
Amir Ghiasi-Noughaby{2}, Pouya Amir{3}, Robert E Kearney{1}, Abolfazl Mohebbi{2}
{1}McGill University, Canada; {2}Polytechnique Montreal, Canada; {3}Queen’s University, Canada

ID: 7321
Wearable Vibration Device for Supporting Postural Stability Based on Proprioceptive Stimulation
Keigo Endo{2}, Hideki Kadone{3}, Modar Hassan{2}, Masakazu Hirokawa{1}, Kenji Suzuki{2}
{1}Data Science Laboratories, NEC Corporation, Japan; {2}University of Tsukuba, Japan; {3}University of Tsukuba, University of Tsukuba Hospital, Japan

ID: 7542
Studying Spinal Feedback Loops Post Tendon Transfer Surgery Using the Pincer Grasp Task: A Neuro-Musculoskeletal Study Using NEUROiD
Kapardi Mallampalli{1}, Kousik Sarathy{1}, Ravi Balasubramanian{2}, Mohan Raghavan{1}
{1}Indian Institute of Technology Hyderabad, India; {2}Oregon State University, United States

ID: 8011
Spike Neural Network of Motor Cortex Model for Arm Reaching Control
Hongru Jiang{2}, Xiangdong Bu{2}, Xiaohong Sui{2}, Huajin Tang{3}, Xiaochuan Pan{1}, Yao Chen{2}
{1}East China University of Science and Technology, China; {2}Shanghai Jiao Tong University, China; {3}Zhejiang University, China

Upper Limb Prostheses
11:30:00 AM - 1:00:00 PM
Room: Durango 2
Session Chair: Arif Rahman and Maria Teresa Arredondo

ID: 6273
Development of an Electromechanical Biomimetic Prosthesis Using 3D Printing: Initial Findings for Interphalangeal and Metacarpophalangeal Joints
Joaquin Aguilera{2}, Jorge Aguilar{2}, Fabian Figueroa{1}, Manuel Gutiérrez{1}, Britam Gomez{2}
{1}Universidad de Concepcion, Chile; {2}Universidad de Santiago de Chile, Chile
Technical Program – Wednesday, July 17th

ID: 6323
From Sequential to Simultaneous Prosthetic Control: Decoding Simultaneous Finger Movements From Individual Ground Truth EMG Patterns
Jan Zbinden{2}, Steven Edwards{1}
{1}Center for Bionics and Pain Research and Vanderbilt University, Sweden; {2}Chalmers University of Technology, Sweden

ID: 6472
Towards Natural Prosthetic Hand Gestures: A Common-Rig and Diffusion Inpainting Pipeline
Seungyup Ka{1}, Taemoon Jeong{1}, Sunwoo Kim{2}, Sankalp Yamsani{3}, Joohyung Kim{3}, Sungjoon Choi{1}
{1}Korea University, Korea; {2}NCSOFT Corporation, Korea; {3}University of Illinois Urbana-Champaign, United States

ID: 6629
Generating Realistic Sound with Prosthetic Hand: A Reinforcement Learning Approach
Taemoon Jeong{2}, Sankalp Yamsani{3}, Jooyoung Hong{3}, Kyungseo Park{1}, Joohyung Kim{3}, Sungjoon Choi{2}
{1}Daegu Gyeongbuk Institute of Science and Technology, Korea; {2}Korea University, Korea; {3}University of Illinois Urbana-Champaign, United States

ID: 7666
A Video Dataset of Everyday Life Grasps for the Training of Shared Control Operation Models for Myoelectric Prosthetic Hands
Ricardo V. Godoy{1}, Bonnie Guan{1}, Anany Dwivedi{2}, Mahonri Owen{2}, Minas Liarokapis{1}
{1}University of Auckland, New Zealand; {2}University of Waikato, New Zealand

ID: 7742
Assisting Upper Limb Prosthesis with a Computer Vision System for Material Detection
Dezmun Roper-Bryant{1}, Joseph Berman{1}, He Huang{2}
{1}North Carolina State University, United States; {2}North Carolina State University, University of North Carolina at Chapel Hill, United States

Theme 10 Keynote - Why Artificial Intelligence Will Not Save Healthcare (and What We Can Do About This)
12:00:00 PM - 1:00:00 PM
Room: Coronado H-J

Dr. Anthony Chang is a practicing pediatric cardiologist with a background in artificial intelligence and global and public health as well as healthcare entrepreneurship. He is the founder of several companies in the artificial intelligence and healthcare sector (AI Med, Medical Intelligence 10, or MI10, and Medical Intelligence Ops, or MI Ops). In addition, he is the founder and chair of the American Board of AI in Medicine (ABA Med) that educates clinicians and stakeholders in healthcare from all over the world. Finally, he is the author of Intelligence-Based Medicine, a book on AI in healthcare as well as editor-in-chief of the journal of the same name.
Students and Young Professionals: Networking Lunch (Wednesday)
1:00:00 PM - 2:00:00 PM
Room: Coronado K

CPSE TC Committee Meeting (Invitation ONLY)
1:00:00 PM - 2:00:00 PM
Room: Sierra 1

Student: Career/Prof Dev Session
2:00:00 PM - 3:30:00 PM
Room: Yucatan 3

Theme 8 Keynote - Highly Integrated Bionic Limbs and Neurehabilitation of Pain
2:00:00 PM - 3:00:00 PM
Room: Coronado H-J

Prof. Max Ortiz Catalán, Ph.D., is the Head of Neural Prosthetic Research at the Bionics Institute and Honorary Principal Fellow at the University of Melbourne, both in Melbourne, Australia. He has created several biomedical innovations, including the first bionic limb connected to the user’s skeleton, nerves, and muscles, and novel treatments for neuropathic pain due to sensorimotor impairments that are currently used worldwide. He has authored 100+ scientific publications and has been keynote and guest speaker in 100+ international conferences and universities worldwide. Several documentaries and 100+ popular science articles in over a dozen languages have featured his work. He has received several honors for his work, notably the “Swedish Embedded Award” by the Swedish Electronic Association in 2018, the “Brian & Joyce Blatchford Award” by ISPO in 2017, the “Delsys Prize” by Delsys in 2016, and the “European Youth Award” by the European Council in 2014.

Prof. Ortiz Catalán research includes bioelectric signals acquisition electronics (analog and digital); bioelectric signal processing and machine learning algorithms for decoding motor volition and control; neuromuscular interfaces; neurostimulation for sensory feedback; bone-anchored prostheses and osseointegration; and virtual and augmented reality for neuromuscular rehabilitation and the treatment of phantom limb pain.
Technical Program – Wednesday, July 17th

Trustworthy Ai in medicine: Implications for data, Algorithms and Systems
2:00:00 PM - 3:30:00 PM
Room: Baja

Technological and computational advances have boosted our ability to collect and analyze patients’ data, thus promoting the integration of Artificial Intelligence (AI) tools in clinical settings. However, the potential impact of such systems on clinical decisions raises concerns about their trustworthiness. In this mini-symposium, we discuss different aspects that need to be evaluated in order to develop trustworthy AI systems. These characteristics will be examined at different levels, spanning from data to algorithms and overall systems. The presentations will encompass both theoretical considerations and practical scenarios derived from international projects will be outlined within the presentation. Beginning at the data level, we will discuss the characteristics of Real World Evidence, addressing how data collection and preprocessing can impact the fairness of AI systems. Drawing from the 4CE consortium’s pandemic-driven creation, aggregating COVID-19 patient data across countries, we share insights. We then delve into algorithm development for trust, emphasizing reliability, uncertainty estimation, and explainability. Analyzing the need for trustworthy Clinical Decision Support Systems, we share Brainteaser project experiences, whose aim is to collect environmental and clinical data for patients with amyotrophic lateral sclerosis and multiple sclerosis, and their clinicians.

Organizers: Giovanna Nicora{2}, Arianna Dagliati{2}, Lucia Sacchi{2}, Barbara Di Camillo{1}, Ioanna Miliou{3}, Riccardo Bellazzi{2}
{1}University of Padova, Italy; {2}University of Pavia, Italy; {3}University of Stockholm, Sweden

Improving Medical Adherence Using Design for All - Part 2
2:00:00 PM - 3:30:00 PM
Room: Fiesta 3&4

This mini-symposium aims to explore the transformative power of electronic product information (ePI) in addressing non-adherence to prescribed treatments. Emphasis will be on digital adaptation to meet patient needs, ensuring actionable, tailored information. Discussions will include economic, societal, and behavioral obstacles to health, with experts from IHI projects GRAVITATE HEALTH AND BEAMER. Equity in healthcare, a complex concept influenced by diverse patient factors like age, health, social status, and living situations, will be a key topic. We’ll delve into how algorithms can predict adherence behavior and how behavioral science and patient segmentation can enhance treatment adherence. The symposium will explore designing solutions that are accessible, inclusive, and user-friendly. A critical focus is on the ePI’s adaptability to individual patient contexts, enhancing understanding and efficiency in information consumption. This involves summarizing content, using iconography, and demoting irrelevant information. Co-creation of solutions will involve healthcare professionals, academia, and the pharma industry, offering practical insights. Participants and students will engage by posing challenges related to non-adherence. The event aims to provide insights beneficial to the clinical and research communities. Session 2: “Technological Innovations and Co-Creation for personalized ePI presentation to patients” features speakers MFernanda Cabrera discussing “the importance of language, culture for digital solutions for all,” Alejandro Medrano on “G-Lens focusing ePIs,” and Catherine Chronaki on “IPS; ePI, Persona Vector and the relevance of FHIR as standard for adherence”

Organizers: María Fernanda Cabrera{3}, Alejandro Medrano{1}, Catherine Chronaki{2}
{1}Gravitate Health project, Spain; {2}HL7 Europe, Belgium; {3}Universidad Politécnica de Madrid, Spain
Harmonizing BME: Integrating Discipline-Based Biomedical Engineering Research and Biomedical Engineering Education
2:00:00 PM - 3:30:00 PM
Room: Fiesta 7&8

This mini-symposium, under the theme of Biomedical Engineering Education and Society (theme #11), aims to foster a dynamic dialogue between biomedical engineering (BME) researchers and educators. The goal is aligning research and teaching practices for effective workforce development in BME. Key discussion points will include: • Integration of Research and Teaching: Exploring ways to bring BME research into the classroom, its benefits, and potential challenges. • The Role of Research-Focused Capstone Projects, Internships, and Co-op Programs in Preparing Students for Practical Applications in Biomedical Engineering. • Best Practices to Synergize the BME Research and Teaching Spheres while promoting the sense of belonging and psychological well-being among BME students. • Developing Biomedical Engineers who are Lifelong Learners. Led by biomedical engineering education experts, this mini-symposium promises a rich discussion on harmonizing the BME research and education spheres for efficient workforce development.

Organizers: May Mansy{4}, Karin Jensen{5}, Alexandra Werth{1}, Harvey Borovets{6}, Raj Rao{3}, Mary Staehle{2}, Sindia Rivera-Jimenez{4}
{1}Cornell University, United States; {2}Rowan University, United States; {3}University of Arkansas, United States; {4}University of Florida, United States; {5}University of Michigan, United States; {6}University of Pittsburgh, United States

Advances in Sleep Health Using Novel Approaches in Data Analytics and technology. Part 2: Advancing Diagnostic Technology in Sleep Medicine
2:00:00 PM - 3:30:00 PM
Room: Fiesta 9&10

It is well recognized that sleep is a basic human need, crucial for our general health and well-being. The short-term effects of poor sleep quality include negative effects on our attention span, memory and learning ability. The longer-term effects are still being studied, but poor sleep quality or sleep deprivation has been linked to significant health problems and large economic costs due to lost productivity. Sleep disorders, such as sleep apnea, insomnia and short sleep duration, are all risk factors that adversely affect health and can lead to diseases such as high blood pressure, ischemic heart disease, stroke and diabetes. Even though polysomnography continues to be the most widely used technique to detect sleep disorders, portable devices and wearables are progressively becoming more accurate and widely accepted for monitoring sleep health. In parallel, (explainable) deep learning models are being integrated to enhance disease detection. Innovative models that combine Big Data with artificial intelligence while maintaining privacy are being developed. In this series of minisymposia, invited experts will present their recent contributions to specific areas in the informatics, diagnostics and therapeutics of sleep disorders, and discuss the issues that remain unresolved. This session focuses on new diagnostic techniques in sleep medicine.

Organizers: Philip de Chazal{2}, Thomas Penzel{1}
{1}Charite University Hospital, Germany; {2}The University Of Sydney, Australia
Advancing Neural Technologies Through Machine Learning
2:00:00 PM - 3:30:00 PM
Room: Monterrey 2&3

The advent of machine learning has led to transformative changes across a myriad of scientific disciplines, including the field of neural engineering. This special session aims to explore the intersection between machine learning methodologies and neural engineering applications. Specifically, it will provide a platform for discussing how machine learning algorithms are increasingly utilized to refine, adapt, and innovate models of sensorimotor control, brain-machine interfaces, neuroprosthetics, and neuromodulation technologies. The session will delve into state-of-the-art techniques, identify prevailing challenges, and elucidate directions for future research. By bringing together leading researchers from both the machine learning and neural engineering communities, this session aims to foster interdisciplinary dialogue and collaboration, thereby accelerating advancements in neural technologies and processing. Examples of topics include, but are not limited to: – Machine Learning Algorithms for Brain-Machine Interfaces – Optimization of Coils and Antennas for Wireless Neural Implants – Neural Network Models of Motor Control, Sensory Processing and Cognition – Data-driven Approaches in Computational Neuroscience – Neural Explainability and Interpretability in Computational Neuroscience – Machine Learning Approaches to Neurological Disorder Diagnosis

Our session aligns seamlessly with several thematic pillars of EMBC, encompassing areas like neural engineering, signal processing, computational systems, and biomedical sensors.

Presenters: Shreya Saxena{5}, Baibhab Chatterjee{3}, Sri Sarma{1}, Rose Faghih{2}, Maryam Shanechi{4}
{1}Johns Hopkins University, United States; {2}New York University, United States; {3}University of Florida, United States; {4}University of Southern California, United States; {5}Yale University, United States

Biomedical Signal Processing for Epilepsy
2:00:00 PM - 3:30:00 PM
Room: Coronado P&Q
Session Chair: Han Yuan and Maria Fernanda Cabrera Umpierrez

ID: 6791
An Attention-Based Hybrid Deep Learning Approach for Patient-Specific, Cross-Patient, and Patient-Independent Seizure Detection
Ijaz Ahmad{6}, Xin Wang{6}, Lin Li{4}, Zhenzhen Liu{4}, Jun Huang{5}, Sunday Timothy Aboyeji{6}, Guanglin Li{6}, Subhas Chandra Mukhopadhyay{2}, Zhiyuan Liu{6}, Guoru Zhao{6}, Yi Guo{3}, Shixiong Chen{1}
{1}Chinese University of Hong Kong, China; {2}Macquarie University, Australia; {3}Shenzhen Bay Laboratory, Shenzhen People’s Hospital, China; {4}Shenzhen Children’s Hospital, China; {5}Shenzhen Fengsheng Biotechnology Co., LTD, China; {6}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
Technical Program – Wednesday, July 17th

ID: 7511
Test-Retest Reliability of Neurovascular Coupling and Impairment in Epilepsy Measured by fNIRS and EEG
Quinn Smith{1}, Jesse Farrand{1}, Intouch Limvaree{1}, Summer Edwards{1}, Tressie Stephens{2}, Ian Dunn{2}, Andrew Connor{2}, Lei Ding{1}, Han Yuan{1}
{1}University of Oklahoma, United States; {2}University of Oklahoma Health Sciences Center, United States

ID: 7537
A Real-Time HFO Detection Framework for Localization of SOZ in iEEG Recording of Patients with Epilepsy
Behrang Fazli Besheli{1}, Chandra Prakash Swamy{1}, Amir Hossein Ayyoubi{2}, Luciano Branco{3}, Gregory A. Worrell{1}, Zhiyi Sha{4}, Jay R. Gavvala{5}, Kai J. Miller{1}, Nuri F. Ince{1}
{1}Mayo Clinic, United States; {2}Mayo Clinic, University of Minnesota, United States; {3}University of Houston, United States; {4}University of Minnesota Twin Cities, United States; {5}UTHealth Houston, United States

ID: 6091
Contribution of Cross-Phase-Amplitude Coupling to Relapse in Infantile Epileptic Spasms Syndrome
Chuting Zhang{1}, Gang Zhu{3}, Wenbin Shi{1}, Guang Yang{2}, Chien-Hung Yeh{1}
{1}Beijing Institute of Technology, China; {2}First Medical Center & Seventh Medical Center of PLA General Hospital, Southern Medical University, China; {3}First Medical Center of PLA General Hospital, China

ID: 6519
Transformer-Based Wavelet-Scalogram Deep Learning for Improved Seizure Pattern Recognition in Post-Hypoxic-Ischemic Fetal Sheep EEG
Ali Roozbehi{1}, Hamid Abbasi{2}, Simerdeep Kaur Dhillon{2}, Joanne Davidson{2}, Alistair Jan Gunn{2}, Laura Bennet{2}
{1}Amirkabir University of Technology, Iran; {2}University of Auckland, New Zealand

ID: 6857
Resource-Efficient Continual Learning for Personalized Online Seizure Detection
Amirhossein Shahbazinia{1}, Flavio Ponzina{2}, Jose Miranda{1}, Jonathan Dan{1}, Giovanni Ansaloni{1}, David Atienza{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}University of California, San Diego, United States
Advancing SSVEP-BCI Decoding: Cross-Subject Transfer Learning and Short Calibrated Approach with ELM-AE
Christian Humberto Flores Vega\(^3\), Paolo Casas Castro\(^2\), Sarah Negreiros de Carvalho\(^1\), Romis Attux\(^3\)
\(^1\)Aeronautics Institute of Technology, Brazil; \(^2\)Universidad de Ingeniería y Tecnología, Peru; \(^3\)Universidade Estadual de Campinas, Brazil

Early Feasibility of an Embedded Bi-Directional Brain-Computer Interface for Ambulation
Jeffrey Lim\(^3\), Po Wang\(^3\), Won Joon Sohn\(^3\), Claudia Serrano-Amesno\(^3\), Mina Ibrahim\(^3\), Derrick Lin\(^3\), Shravan Thaploo\(^3\), Susan Shaw\(^2\), Michelle Armacost\(^2\), Hui Gong\(^2\), Brian Lee\(^4\), Darrin Lee\(^4\), Richard Andersen\(^1\), Payam Heydari\(^3\), Charles Liu
\(^1\)California Institute of Technology, United States; \(^2\)Rancho Los Amigos National Rehabilitation Center, United States; \(^3\)University of California, Irvine, United States; \(^4\)University of Southern California, Rancho Los Amigos National Rehabilitation Center, United States

Reconstruction of Continuous Hand Grasp Movement from EEG Using Deep Learning
Yuting Tang, Neethu Robinson, Xi Fu, Kavitha P. Thomas, Aung Aung Phyoe Wai, Cuntai Guan
Nanyang Technological University, Singapore

Brain-Computer-Brain System for Individualized Transcranial Alternating Current Stimulation with Concurrent EEG Recording: A Healthy Subject Pilot Study
Rosary Lim\(^1\), Muyun Jiang\(^2\), Kai Keng Ang\(^1\), Xiaohao Lin\(^2\), Cuntai Guan\(^2\)
\(^1\)Agency for Science, Technology and Research, Singapore; \(^2\)Nanyang Technological University, Singapore

A Study on Changes in Estimation Accuracy for EEG Data During Calibration and Operation in MI-BCI
Takuya Kanda, Takashi Isezaki, Kengo Okitsu
NTT Corporation, Japan

Enhancing Brain Machine Interface Decoding Accuracy Through Domain Knowledge Integration
Kengo Okitsu\(^1\), Takashi Isezaki\(^1\), Kei Obara\(^2\), Yukio Nishimura\(^2\)
\(^1\)NTT Corporation, Japan; \(^2\)Tokyo Metropolitan Institute of Medical Science, Japan
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<tr>
<th>ID</th>
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<tr>
<td>6590</td>
<td>Enhance Heart Rate Measurement from Remote PPG with Head Motion Awareness from Image</td>
<td>Jiyang Li{2}, Korosh Vatanparvar{1}, Migyeong Gwak{1}, Li Zhu{1}, Jilong Kuang{1}, Jun Alex Gao{1}</td>
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<td></td>
<td></td>
<td>{1}Samsung Research America, United States; {2}State University of New York at Buffalo, United States</td>
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<td>6885</td>
<td>Pressure Prediction for the Personalized and Automatic Fitting of Respiratory Masks</td>
<td>Yamen Al Habash{1}, Bahe Hachem{2}, Hugo Taeckens{1}, Loïc Degueldre{2}, Luc Duong{1}</td>
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<td></td>
<td>{1}École de Technologie Supérieure, Canada; {2}Numalogics Inc., Canada</td>
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<tr>
<td>6992</td>
<td>Causal Inference Based Hierarchical Regression Model for Cuffless Blood Pressure Estimation</td>
<td>Xinyue Song{2}, Xuequan Zan{1}, Zhizhong Fu{2}, Xiaorong Ding{2}</td>
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<td></td>
<td></td>
<td>{1}Chengdu Empsun Medical Science and Technology Com. Ltd., China; {2}University of Electronic Science and Technology of China, China</td>
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<tr>
<td>7491</td>
<td>ThermalBP: A Unified Thermal Imaging Model to Estimate Blood Pressure</td>
<td>Ishaan Jalan{1}, Madhav Rao{1}, Vijayakumari BM{3}, Ganesh Subramaniam{2}</td>
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<tr>
<td></td>
<td></td>
<td>{1}International Institute of Information Technology Bangalore, India; {2}Vios Medical Pvt Ltd, India; {3}ViosMedical Pvt Ltd., India</td>
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<tr>
<td>7523</td>
<td>Validation of a Novel Respiratory Monitoring Method and System Based on Antenna Sensors and Optical Tracking of Chest Motion</td>
<td>Mehran Ahadi, Amine Miled, Marc-André Dugas, Younès Messaddeq</td>
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<td>Université Laval, Canada</td>
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<td>8044</td>
<td>Towards a Wearable Optical Interrogator for Transcutaneous Blood Pressure Measurement via an Implanted Fiber Bragg Grating Sensor</td>
<td>Songping Sun, Erik Dutson, Rory Geoghegan</td>
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<td>University of California, Los Angeles, United States</td>
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<td>ID: 6328</td>
<td>Development of a Computational Model for ECT Stimulation Titration</td>
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<td>Joanne Flood{2}, Socrates Dokos{1}, Colleen Loo{1}</td>
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</tr>
<tr>
<td>{1}University of New South Wales, Australia; {2}University of New South Wales, ResMed Ltd, Australia</td>
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<tr>
<th>ID: 6531</th>
<th>Positive Neuroblastoma Differentiation with AC Electrical-Stimulation</th>
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<tr>
<td>Daniel Martín{1}, Santiago F. Scaglìusi{1}, Pablo Pérez{1}, Alberto Olmo{1}, Antonio Algarín{1}, Alberto Yúfera{1}, Gloria Huertas{1}, Paula Daza{2}</td>
<td></td>
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<tr>
<td>{1}IMSE-CNM - Consejo Superior de Investigaciones Científicas, Spain; {2}Universidad de Sevilla, Spain</td>
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<th>ID: 6872</th>
<th>RF-induced Heating for Partially-In and Partially-Out Bipolar Parallel Medical Electrodes</th>
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<tr>
<td>Md Zahidul Islam, Mir Khadiza Akter, Qingyan Wang, Ran Guo, Jianfeng Zheng, Ji Chen</td>
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<td>University of Houston, United States</td>
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<th>ID: 6749</th>
<th>Advancements in Non-Invasive Neuroimaging: Exploring the Potential of Radar Technology for Brain Imaging and Tumour Detection</th>
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<tr>
<td>Keniel Peart, Indu Bodala, Shelly Vishwakarma</td>
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<td>University of Southampton, United Kingdom</td>
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<tr>
<th>ID: 6684</th>
<th>Molecular Dynamics Model for Developing Wearable Biosensors</th>
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<tr>
<td>Parijat Deshpande, Dharmendr Kumar, Yogesh Badhe, Beena Rai</td>
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<td>Tata Consultancy Services Limited, United States; Tata Consultancy Services Limited, India</td>
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<th>ID: 7534</th>
<th>Software Sensor to Monitor a Synthetic Microbial Community Emulating the Dietary Fiber Impact on the Gut Microbiota</th>
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<tr>
<td>Bárbara Maya, Yocanxóchitl Perfecto-Avalos, Abel Gutiérrez-Vilchis, Alejandro García-Gonzalez</td>
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<td>Tecnológico de Monterrey, Mexico</td>
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### Devices for Ambulatory Use & Independent Living

**2:00:00 PM - 3:30:00 PM**  
**Room: Coronado D&E**  
Session Chair: Tanvi Banerjee and Fanny Casado-Pena

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<tr>
<td>6476</td>
<td>Non-Electrically Controlled Nucleic Acid Analysis Microdevice to Enable Testing for Viral Infections in the Field</td>
<td>Yusuke Kimura{1}, Masashi Ikeuchi{2}, Mitsumasa Taguchi{1}</td>
<td>{1}National Institutes for Quantum Science and Technology, Japan; {2}Tokyo Medical and Dental University, Japan</td>
</tr>
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<td>7190</td>
<td>mmYOLOH-p: A Clinically-Oriented mmWave-Based Human Pose Estimation Tool for Unobtrusive Patient Monitoring</td>
<td>Jonathan Williams, Jimmy Wang, Michael Stevens, Nigel Lovell, Ahmadreza Argha</td>
<td>University of New South Wales, Australia</td>
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<td>7432</td>
<td>Predictive Modeling of Blood Pressure Progression</td>
<td>Ricardo Saraiva, Paulo Carvalho, Jorge Henriques, Marco Simões</td>
<td>Universidade de Coimbra, Portugal</td>
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<td>7433</td>
<td>Comparative Analysis of Data Augmentation Approaches for Blood Pressure Prediction</td>
<td>Ricardo Saraiva, Paulo Carvalho, Jorge Henriques, Marco Simões</td>
<td>Universidade de Coimbra, Portugal</td>
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<td>7459</td>
<td>An AI-Driven Camera-Based Platform for Patient Ambulation Assessment</td>
<td>Mostafa Habibi{2}, Mehrdad Nourani{2}, Dennis Sullivan{1}</td>
<td>{1}U.S. Department of Veterans Affairs, United States; {2}University of Texas at Dallas, United States</td>
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<td>7517</td>
<td>i-Flow: Design and Evaluation of a Wearable Uroflowmeter with Non-Invasive Low Power Bio-Impedance Sensing</td>
<td>Kanika Dheman, Manuel Glahn, Michele Magno</td>
<td>ETH Zürich, Switzerland</td>
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### Digital Biomarkers

**2:00:00 PM - 3:30:00 PM**  
**Room: Durango 1**  
Session Chair: Maria Athanasiou and Nicolai Spicher

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<tr>
<td>7939</td>
<td>GluMarker: A Novel Predictive Modeling of Glycemic Control Through Digital Biomarkers</td>
<td>Ziyi Zhou, Ming Cheng, Xingjian Diao, Yanjun Cui, Xiangling Li</td>
<td>Dartmouth College, United States</td>
</tr>
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Technical Program – Wednesday, July 17th

ID: 6196
Assessment of Serum Creatinine and Serum Sodium Prognostic Potential in Heart Failure Patients Using Machine Learning
Sona Alyounis{1}, Ahsan Habib Khandoker{1}, Cesare Stefanini{2}, Leontios Hadjileontiadis{1}
{1}Khalifa University, U.A.E.; {2}Scuola Superiore Sant’Anna, Italy

ID: 6883
Predicting Cardiovascular Disease Risk in Tobacco Users Using Machine Learning Algorithms
Asma Khimani{1}, Andrew Hornback{1}, Neha Jain{1}, Pavithra Avula{1}, Anirudh Jaishankar{1}, May Dongmei Wang{2}
{1}Georgia Institute of Technology, MIBLab, United States; {2}Georgia Institute of Technology, MIBLab, Emory, United States

ID: 7513
Evolutionary Learning-Derived IncRNA Signature with Biomarker Discovery for Predicting Stage of Colon Adenocarcinoma
Yann-Lin Ho{2}, Yann-Jen Ho{1}, Fang-Yu Ko{2}, Shinn-Ying Ho{2}
{1}National Taiwan University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan

ID: 7241
A Novel BOND-KNN Algorithm to Predict Breast Cancer Survival Using Multi-Modal Features
Chandrima Debnath, Soumita Guria, Debashree Guha, Debjani Chakraborty
Indian Institute of Technology Kharagpur, India

ID: 7936
Learning from Two Decades of Blood Pressure Data: Demography-Specific Patterns Across 75 Million Patient Encounters
Seyedeh Somayyeh Mousavi, Yuting Guo, Chad Robichaux, Abeed Sarker, Reza Sameni
Emory University, United States

Electrophysiology
2:00:00 PM - 3:30:00 PM
Room: Coronado F&G
Session Chair: Daniël Pijnappels and Antonis Sakellarios

ID: 6165
Towards Personalized Anti-Tachycardia Pacing: A Formal Analysis of Reentry Mechanisms and Adaptive Algorithm Development
Jicheng Gu, Peiheng Cai, Zhihao Jiang
ShanghaiTech University, China

ID: 7713
A Densenet-Based Abnormal Ventricular Potentials Onset Delineation: A Feasibility Study
Andrea Pitzus{2}, Christian Cossu{2}, Giulia Baldazzi{2}, Luigi Raffo{2}, Graziana Viola{1}, Danilo Pani{2}
{1}Santissima Annunziata Hospital, Italy; {2}Università degli Studi di Cagliari, Italy
Technical Program – Wednesday, July 17th

ID: 7859
Voltage Independent Depth Control and Acute Lesion Formation Findings in Epicardial Pulsed Field Ablation System for Surgical Ablations
Daniel Laurita, Dragan Juzbasich, Celeen Khrestian, Seungyup Lee
Case Western Reserve University, United States

ID: 7546
Baseline Drift Tolerant Signal Encoding for ECG Classification with Deep Learning
Robert O’Shea, Prabodh Katti, Bipin Rajendran
King’s College London, United Kingdom

ID: 7029
Optimizing Onset and Offset Detection in Surface Diaphragm Electromyographic Signals: A Signal Quality-Driven Approach
Abel Torres{2}, Luis Estrada-Petrocelli{1}, Tim Raveling{3}, Marieke Duiverman{3}
{1}Universidad Latina de Panamá, Panama; {2}Universitat Politècnica de Catalunya, Spain; {3}University of Groningen, Netherlands

ID: 7312
Validation of an Algorithm for Automatic Calculation of Inter-Lesion Distance in Radiofrequency Catheter Ablation of Atrial Fibrillation
Fernando Setién-Dodero, Félix Fanjul-Vélez, José Luis Arce-Diego
University of Cantabria, Spain

Medical Image Segmentation & Classification
2:00:00 PM - 3:30:00 PM
Room: Yucatan 1
Session Chair: Yimeng Dou and Rita Huan-Ting Peng

ID: 6263
Oocyte Microscopic Image Fertilization Prediction Based on First Polar Body Morphology Using YOLOv8
Thanakorn Sappakit{1}, Krittapat Onthuam{2}, Tinapat Limsila{1}, Ronnapee Chaichaowarat{1}, Chanakarn Suebthawinkul{1}
{1}Chulalongkorn University, Thailand; {2}Université de Toulon, France

ID: 6379
Optimizing Coil Selection for Cerebral Aneurysm Treatment Using PyRadiomics and Machine Learning Models
{1}Allm Inc., Japan; {2}DataForm Co., Ltd., Japan; {3}Jikei University, Japan; {4}Tokyo University of Science, Japan
ID: 6392
**Classification of Carotid Plaque with Jellyfish Sign Through Convolutional and Recurrent Neural Networks Utilizing Plaque Surface Edges**
Takeshi Yoshidomi{1}, Shinji Kume{2}, Hiroaki Aizawa{1}, Akira Furui{1}
{1}Hiroshima University, Japan; {2}Hiroshima University Hospital, Japan

ID: 6641
**Channel Fitting Network for Retinal Lesion Segmentation from OCT Images**
Zhiyu Ning{4}, Yupeng Xu{2}, Changyang Li{1}, Yichao Hao{4}, Zhiyuan Ning{4}, Cong Liu{1}, Ke Yan{3}
{1}Rudder Technology Pty Ltd, Australia; {2}Shanghai General Hospital, China; {3}ToVision Technology Pty Ltd, China; {4}University of Sydney, Australia

ID: 6899
**Automated Alzheimer’s, Mild Cognitive Impairment, and Normal Aging Screening Using Polar Transformation of Optic Disc and Central Zone of Fundus Images**
Gavin Luengnaruemitchai{2}, Sirikorn Sangchocanonta{3}, Adirek Munthuli{3}, Phongphan Phienphanich{3}, Sujitra Puangarom{3}, Supharat Jariyakosol{1}, Parima Hirunwiwatkul{1}, Chaturong Tantibundhit{3}
{1}Chulalongkorn University, Thailand; {2}International School Bangkok, Thailand; {3}Thammasat University, Thailand

ID: 7211
**Mechanical Performance of Engineered Heart Tissue Can Be Measured with POC-Based Video Analysis**
Masaru Tsuchida{1}, Moyu Hasegawa{2}, Kenji Miki{2}, Shigeru Miyagawa{2}, Kunio Kashino{1}
{1}NTT Corporation, Japan; {2}Osaka University, Japan

**Neurorehabilitation**
2:00:00 PM - 3:30:00 PM
*Room: Coronado B&C*
Session Chair: Leanne L.H. Chan and Diego L. Guarin

ID: 6556
**Remote Motor Rehabilitation: EMG-IMU Based Deep Learning Model Improves the Estimate of Wrist Kinematics**
Ilaria Siviero{2}, Florian Helmhold{1}, Andreas Markus Ray{1}, Carlos Bibián{1}, Gloria Menegaz{2}, Ander Ramos Murguialday{1}, Silvia Francesca Storti{2}
{1}Eberhard Karls Universität Tübingen, Germany; {2}Università degli Studi di Verona, Italy

ID: 6624
**Novel Tactile Stimulation Using a Vibratory Foot Orthosis: A Preliminary Study**
Wachirayongyot Thimabut{2}, Natapatchakrid Thimabut{3}, Liang Peng{1}, Zeng-Guang Hou{1}
{1}Institute of Automation, Chinese Academy of Sciences, China; {2}Institute of Automation, Chinese Academy of Sciences & University of Chinese Academy of Sciences, China; {3}Srinakharinwirot University, Thailand
Cross-Speed and Cross-Posture Gait Phase Partitioning Based on Multi-Modal Data
Jionghui Liu{1}, Fumin Jia{1}, Yonglin Wu{2}, Chenyun Dai{2}, Yangyang Yuan{1}, Yao Guo{1}
{1}Fudan University, China; {2}Shanghai Jiao Tong University, China

Efficacy of Aperiodic Electrical Stimulation in Retina to Enhance Visual Cortical Responses
Zixin Ye, Leanne Lai-Hang Chan
City University of Hong Kong, Hong Kong

High-Density Electromyography Biomarkers for Detecting and Monitoring of Spastic Muscles During Passive Stretch
Nhi Nguyen{2}, Michael Houston{2}, Yang Liu{2}, Yen-Ting Chen{1}, Sheng Li{4}, Yingchun Zhang{3}
{1}Northeastern State University, United States; {2}University of Houston, United States; {3}University of Miami, United States; {4}University of Texas Health Science Center / TIRR Memorial Hermann, United States

Motor Task Complexity Matters More in Dual Task Gait Performance for Early-Stage Parkinson’s Disease Identification
Lin Meng{2}, Xiaofei Zhang{2}, Yifan Yang{2}, Jun Pang{2}, Yu Shi{2}, Lei Chen{1}, Rui Xu{2}
{1}Tianjin Huanhu Hospital, China; {2}Tianjin University, China

Signal Processing & Classification of Electromyographic Signal
2:00:00 PM - 3:30:00 PM
Room: Coronado M&N
Session Chair: Seyedfakhreddin Nabavi and Maria Teresa Arredondo

Deep Generative Replay-Based Class-Incremental Continual Learning in sEMG-Based Pattern Recognition
Suguru Kanoga{2}, Ryo Karakida{2}, Takayuki Hoshino{1}, Yuto Okawa{2}, Mitsunori Tada{2}
{1}Keio University, National Institute of Advanced Industrial Science and Technology, Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan

Inter-Subject Variance Transfer Learning for EMG Pattern Classification Based on Bayesian Inference
Seitaro Yoneda, Akira Furui
Hiroshima University, Japan

A Spatial Feature Extraction Method for Enhancing Upper Limb Motion Intent Prediction in EMG-PR System
Boxing Peng, Haoshi Zhang, Xiangxin Li, Yue Zheng, Guanglin Li
Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
ID: 6020
**FPGA-Based Implementation of Random Forest Classifier for sEMG Signal Classification**
Wagner Martins{2}, Leia Bernardi Bagesteiro{1}, Tiago Weber{2}, Alexandre Balbinot{2}
{1}San Francisco State University, United States; {2}Universidade Federal do Rio Grande do Sul, Brazil

ID: 7864
**A Graph Neural Network Model for Real-Time Gesture Recognition Based on sEMG Signals**
Pragatheeswaran Vipulanandan, Kamal Premaratne, Manohar Murthi
University of Miami, United States

ID: 6896
**EMGcipher: Decoding Electromyography for Upper-Limb Gesture Classification with Explainable AI for Resource Optimization**
Hunmin Lee, Ming Jiang, Qi Zhao
University of Minnesota Twin Cities, United States

**Ultrasound Imaging**
2:00:00 PM - 3:30:00 PM
*Room: Yucatan 2*
Session Chair: Ulas Bagci and Kwangtaek (Samuel) Kim

ID: 6166
**Bullet: An Acceleration Method for Cartesian Partial Echo Acquisition**
Haotian Hong, Yuyang Ren, Wenjian Liu, Zijian Zhou, Haikun Qi, Peng Hu
ShanghaiTech University, China

ID: 6901
**Pitfalls with Neural Radiance Fields for 3D Freehand Ultrasound Reconstruction**
Yimeng Dou, Tomy Varghese
University of Wisconsin-Madison, United States

ID: 7451
**Thermal Strain Estimation Using Ultrasound Echo Stretching Algorithm for Temperature Monitoring: Initial Results**
Muthu Rattina Subash Ramu, Kavitha Arunachalam, Arun Kumar Thittai
Indian Institute of Technology Madras, India

ID: 7598
**A Quantitative Ultrasound Phantom Calibration Study: Effect of Depth on Attenuation and Backscatter Properties**
Salman Jubair Jim{2}, Alex Devlin{1}, Farah Deeba{2}
{1}University of British Columbia, Canada; {2}University of North Carolina at Charlotte, United States

ID: 7655
**SimICL: A Simple Visual In-Context Learning Framework for Ultrasound Segmentation**
Yuyue Zhou, Banafshe Felfeliyan, Shrimanti Ghosh, Jessica Knight, Fatima Alves-Pereira, Christopher Keen, Jessica Küpper, Abhilash R. Hareendranathan, Jacob L Jaremko
University of Alberta, Canada
ID: 7746

**Synthetic Ultrasound Images to Benchmark Echocardiography-Based Biomechanics**
Tanmay Mukherjee, Sunder Neelakantan, Kyle Myers, Carl Tong, Reza Avazmohammadi
Texas A&M University, United States

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**Theme 4 Keynote - Multiscale Modeling and Design Principles of Biomolecular Networks**
3:30:00 PM - 4:30:00 PM
Room: Coronado H-J

Yu (Brandon) Xia is a Professor in the Department of Bioengineering at McGill University, where he holds the Canada Research Chair (Tier 1) in Computational and Systems Biology. He graduated from Peking University with B.S. in Chemistry (major) and Computer Science (minor). He received his Ph.D. in Chemistry from Stanford University, specializing in computational biology with Michael Levitt. After postdoctoral research in bioinformatics with Mark Gerstein at Yale University, he became an Assistant Professor of Bioinformatics and Chemistry at Boston University, with a secondary appointment in Biomedical Engineering. He joined McGill University in 2013 as Associate Professor and was subsequently promoted to Professor. His research uses computation and data science to probe design principles of proteins and protein networks in health and disease.

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**Wednesday Refreshments**
3:30:00 PM - 5:00:00 PM
Room: Veracruz Hall

**SAC Presentation (Invitation ONLY)**
3:30:00 PM - 4:30:00 PM
Room: Yucatan 3

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**Wednesday Poster Session - Analysis of Clinical and Biological Data & Knowledge**
3:30:00 PM - 5:00:00 PM
Room: Veracruz Hall

ID: 6281

**Federated Learning for Enhanced ECG Signal Classification with Privacy Awareness**
Quoc Bao Phan{2}, Linh Nguyen{2}, Ngoc Thang Bui{1}, Dinh C. Nguyen{3}, Lan Zhang{2}, Tuy Tan Nguyen{2}
{1}Mayo Clinic, United States; {2}Northern Arizona University, United States; {3}University of Alabama in Huntsville, United States
Poster Board: 1

ID: 6832

**Novel Alzheimer’s Disease Stating Based on Comorbidities-Informed Graph Neural Networks**
Ferial Abuhantash{1}, Mohd Khalil Abuhantash{1}, Roy Welsch{2}, Mohamed Lamine Seghier{1}, Leontios Hadjileontiadis{1}, Aamna Al Shehhi{1}
{1}Khalifa University, U.A.E.; {2}Massachusetts Institute of Technology, United States
Poster Board: 2
ID: 6172
**The Etiology of Autism Spectrum Disorder and Gender Dysphoria**
Aiden Nelson, Paris Somerville, Simran Patel, John Matta
Southern Illinois University Edwardsville, United States
Poster Board: 3

ID: 7383
**Knowledge Models for Cancer Clinical Practice Guidelines: Construction, Management and Usage in Question Answering**
Pralaypati Ta, Bhumika Gupta, Arihant Jain, Sneha Sree C, Keerthi Ram, Mohanasankar Sivaprakasam
Indian Institute of Technology Madras, India
Poster Board: 4

ID: 6280
**NamE: Capturing Biological Context in KGEs via Contextual Named Graph Embeddings**
Jeffrey Sardina{1}, Luca Costabello{1}, Christophe Guéret{1}, Hossein Mohammadi{2}
{1}Accenture, Ireland; {2}Wright State University, United States
Poster Board: 5

ID: 6364
**Identifying Features for Keloid Scars Subtyping Using K-Modes Clustering**
Anirudh Jaishankar{1}, Neha Jain{1}, Andrew Hornback{1}, Asma Khimani{1}, Pavithra Avula{1}, May Dongmei Wang{2}
{1}Georgia Institute of Technology, MIBLab, United States; {2}Georgia Institute of Technology, MIBLab, Emory, United States
Poster Board: 6

ID: 6442
**Predicting Functional Surface Topographies Combining Topological Data Analysis and Deep Learning Across the Human Protein Universe**
Bowie Ye, Jie Liang
University of Illinois Chicago, United States
Poster Board: 7

ID: 6571
**Sparse Negative Binomial Signal Recovery for Genomic Variant Prediction in Diploid Species**
Jocelyn Omelas Munoz{2}, Erica Rutter{2}, Mario Banuelos{1}, Suzanne Sindi{2}, Roummel Marcia{2}
{1}California State University, Fresno, United States; {2}University of California, Merced, United States
Poster Board: 8

ID: 6998
**On the Optimization of GWFA Algorithm: Enabling Real-Case Applications Supporting Alignment Backtracking**
Mirko Coggi, Antonio Sgarlata, Guido Walter Di Donato, Marco Domenico Santambrogio
Politecnico di Milano, Italy
Poster Board: 9
Technical Program – Wednesday, July 17th

ID: 7708
**BCAT2 Expression in IDC Breast Cancer Subtypes: A Weighted Feature-Based Approach to Identify and Rank Associated Genes Across Public Datasets**
Rukhsana Rukhsana{1}, Wajahat Ali Khan{2}, Myra Conway{2}, Young Joo Lee{1}, Asad Masood Khattak{3}
{1}Sejong University, Korea; {2}University of Derby, United Kingdom; {3}Zayed University, U.A.E.
Poster Board: 10

ID: 7897
**Biogeographic Ancestry Analysis of Microtia Patients in Colombia Using Nonlinear Probabilistic Clustering**
Javier Andrés Sierra-Pineda{3}, Hernán Felipe García Arias{2}, Gloria Liliana Porras-Hurtado{1}, Álvaro Ángel Orozco-Gutiérrez{3}, David Augusto Cárdenas-Peña{3}, Daniela V. Luquetti{4}
{1}Comfamiliar Risaralda, Colombia; {2}Universidad de Antioquia, Colombia; {3}Universidad Tecnológica de Pereira, Colombia; {4}University of Washington, United States
Poster Board: 11

ID: 6024
**Interpretable Survival Risk Prediction for High-Grade Glioma Patients via Radiomic Features from Peritumoral Region**
Rohan Dhamdhere{1}, Satvika Bharadwaj{1}, Arpit Aggarwal{1}, Pushkar Mutha{1}, Wenqi Shi{1}, Benoit Marteau{1}, Anant Madabhushi{1}, May Dongmei Wang{2}
{1}Georgia Institute of Technology, Emory, United States; {2}Georgia Institute of Technology, MIBLab, Emory, United States
Poster Board: 12

ID: 6153
**Calf Fatigue Recognition in Heel-Lift Exercise Using Video Sequences of Body Sway**
Takuya Kamitani, Masaya Kojima, Masashi Nishiyama
Tottori University, Japan
Poster Board: 13

ID: 6782
**Predicting Nonalcoholic Fatty Liver Disease in Obese Populations with 3D Body Scans**
Yijiang Zheng, Zhuoxin Long, Ruting Cheng, Boyuan Feng, Khashayar Vaziri, Xiaoke Zhang, James Hahn
George Washington University, United States
Poster Board: 14

ID: 6918
**An Improvised Approach Using YOLOv3 Architecture for Digital Panoramic Teeth Recognition and Classification**
{1}DAPM RV Dental College and Hospital Bengaluru, India; {2}Rashtreeya Vidyalaya College of Engineering, India; {3}RV University, India
Poster Board: 15
ID: 7225
**Video-Based Body Parsing for Neonatal Body-Parts Actigraphy: A Clinical Study in NICU**
Yongshen Zeng{2}, Liping Pan{3}, Xiaoyan Song{1}, Qiqiong Wang{1}, Jie Yang{1}, Hongzhou Lu{3}, Wenjin Wang{2}
{1}Nanfang Hospital, China; {2}Southern University of Science and Technology, China; {3}Third People's Hospital of Shenzhen, China
Poster Board: 16

ID: 7444
**Improving Pediatric Pneumonia Diagnosis with Adult Chest X-Ray Images Utilizing Contrastive Learning and Embedding Similarity**
Mohammad Zunaed{1}, Anwarul Hasan{2}, Taufiq Hasan{1}
{1}Bangladesh University of Engineering and Technology, Bangladesh; {2}Qatar University, Qatar
Poster Board: 17

ID: 7615
**Language Augmentation in CLIP for Improved Anatomy Detection on Multi-Modal Medical Images**
Mansi Kakkar{2}, Dattesh Shanbhag{1}, Chandan Aladahalli{1}, Gurunath Reddy M{1}
{1}GE Healthcare, India; {2}Indian Institute of Technology Madras, India
Poster Board: 18

ID: 7660
**Fast Rule-Based NER in SpaCy for Chest Radiography Reports with CheXpert’s 14 Categories**
Wei Chen Chang, Chien-Hung Tsou, Adam Huang
National Central University, Taiwan
Poster Board: 19

ID: 7781
**Towards Dopaminergic SPECT Estimation from Structural MRI Sequences to Characterize Parkinson’s Disease**
Franklin Sierra-Jerez{1}, Yeferson Valencia{1}, Diana Giraldo{2}, Fabio Martínez Carrillo{1}
{1}Universidad Industrial de Santander, Colombia; {2}Universiteit Antwerpen, Belgium
Poster Board: 20

ID: 7807
**TransRUPNet for Improved Polyp Segmentation**
Debesh Jha{1}, Nikhil Kumar Tomar{2}, Debayan Bhattacharya{3}, Koushik Biswas{1}, Ulas Bagci{1}
{1}Machine & Hybrid Intelligence Lab, Northwestern University, United States; {2}Northwestern University, United States; {3}Technische Universität Hamburg, University Medical Center Hamburg-Eppendorf, Germany
Poster Board: 21
ID: 6246  
**High-Frequency SSVEP-BCI Stimulation Frequency Optimization Based on BCI Accuracy**  
Sodai Kondo, Hisaya Tanaka  
Kogakuin University, Japan  
Poster Board: 22

ID: 6336  
**EEG Data Augmentation for Emotion Recognition Using Diffusion Model**  
Yi-Dong Zhao, Yan-Kai Liu, Wei-Long Zheng, Bao-Liang Lu  
Shanghai Jiao Tong University, China  
Poster Board: 23

ID: 6344  
**Assessing the Impact of Environment and Electrode Configuration on P300 Speller Performance and EEG Signal Quality**  
Sandra-Carina Noble{2}, Tomás Ward{1}, John Ringwood{2}  
{1} Dublin City University, Ireland; {2} Maynooth University, Ireland  
Poster Board: 24

ID: 6345  
**Decoding Auditory Attention for Real-Time BCI Control**  
Vinay Raghavan, Prachi Patel, Xiaomin He, Nima Mesgarani  
Columbia University, United States  
Poster Board: 25

ID: 6409  
**Enhancing Word-Level Imagined Speech BCI Through Heterogeneous Transfer Learning**  
Ang Li{1}, Zhenyu Wang{1}, Xi Zhao{2}, Tianheng Xu{1}, Ting Zhou{3}, Honglin Hu{1}  
{1} Shanghai Advanced Research Institute, Chinese Academy of Sciences, China; {2} Shanghai University, China; {3} Shanghai University, Shanghai Frontier Innovation Research, China  
Poster Board: 26

ID: 6681  
**A Neuro-Feedback Prototype Based on Transcranial Doppler Ultrasound for Brain Computer Interface Applications**  
Rosita Rabbito{2}, Alessia Cinanni{2}, Luca Bussi{1}, Caterina Guiot{2}, Silvestro Roatta{2}  
{1} Brain Technologies, Italy; {2} Università degli Studi di Torino, Italy  
Poster Board: 27
Technical Program – Wednesday, July 17th

ID: 6716
A Three-Stage Strategy Significantly Improves Hand Movement Direction Decoding of a Single Neural Unit
Shanshan Yu, Fengyan Liang, Yilin Zhang, Long Chen, Lijun Dong, Zheshan Guo, Jing Jie, Xiao Wang, Ming Yin
Hainan University, China
Poster Board: 28

ID: 6738
Cross-Paradigm Data Alignment to Improve the Calibration of Asynchronous BCI Systems in EEG-Based Speech Imagery
Mingtao Li{2}, Sio Hang Pun{2}, Fei Chen{1}
{1}Southern University of Science and Technology, China; {2}State Key Laboratory of Analog and Mixed Signal VLSI, University of Macau, Macau
Poster Board: 29

ID: 6743
An Online Brain-Computer Interface for a Precise Positioning of Target Based on Rapid Serial Visual Presentation
Jiayuan Meng, Mingming Yang, Sheng Zhang, Minpeng Xu, Lin Meng, Dong Ming
Tianjin University, China
Poster Board: 30

ID: 6745
A Novel SSVEP Modulation Method Utilizing VR-Based Binocular Vision
Haifeng Liu{4}, Zhenyu Wang{1}, Ruxue Li{5}, Xi Zhao{2}, Tianheng Xu{1}, Ting Zhou{3}, Honglin Hu{1}
{1}Shanghai Advanced Research Institute, Chinese Academy of Sciences, China; {2}Shanghai University, China; {3}Shanghai University, Shanghai Frontier Innovation Research, China; {4}ShanghaiTech University, China; {5}ShanghaiTech University. Shanghai Advanced Research Institute, Chinese Academy of Sciences, China
Poster Board: 31

ID: 6789
Prediction Errors from Distinct Perspectives Induce Separable EEG Features for Brain-Computer Interface
Feng He, Sheng Zhang, Mingming Yang, Jiayuan Meng, Minpeng Xu, Lin Meng, Dong Ming
Tianjin University, China
Poster Board: 32

ID: 6796
Utilizing Motor-Imagery Brain-Computer Interfaces for the Assessment of Developmental Coordination Disorder in Children
Kuan-Yi Lee{1}, Kong-Yi Chang{2}, Hao-Che Hsu{3}, Yu-Ting Tseng{2}, Chun-Shu Wei{3}, Shih-Syun Lin{1}, Chun-Hsiang Chuang{2}
{1}National Taiwan Ocean University, Taiwan; {2}National Tsing Hua University, Taiwan; {3}National Yang Ming Chiao Tung University, Taiwan
Poster Board: 33
ID: 6819
**EEG Emotion Recognition Supervised by Temporal Features of Video Stimuli**
Shuang Ran{1}, Wei Zhong{2}, Danting Duan{1}, Fei Hu{1}, Long Ye{1}, Qin Zhang{1}
{1}Communication University of China, China; {2}State Key Laboratory of Media Convergence and Communication, Communication University of China, China
Poster Board: 34

ID: 6873
**Wavelet Analysis of Noninvasive EEG Signals Discriminates Complex and Natural Grasp Types**
Ali Rabiee, Sima Ghafoori, Anna Cetera, Yalda Shahriari, Reza Abiri
University of Rhode Island, United States
Poster Board: 35

ID: 6953
**Towards EEG-Based Talking-Face Generation for Brain Signal-Driven Dynamic Communication**
Ji-Ha Park, Seo-Hyun Lee, Seong-Whan Lee
Korea University, Korea
Poster Board: 36

ID: 6954
**Towards Speech Synthesis of Unconstrained Sentences from Speech-Related Biosignals**
Deok-Seon Kim, Seo-Hyun Lee, Young-Eun Lee, Seong-Whan Lee
Korea University, Korea
Poster Board: 37

ID: 6972
**Exploring the Use of Spatial Information in Emotion Classification Using Functional Connectivity and Channel Distribution**
Yuzeng Xu, Sho Otsuka, Seiji Nakagawa
Chiba University, Japan
Poster Board: 38

ID: 7039
**Improving Inner Speech Decoding by Hybridisation of Bimodal EEG and fMRI Data**
Scott Wellington{4}, Holly Wilson{4}, Foteini Simistira Liwicki{1}, Vibha Gupta{1}, Rajkumar Saini{1}, Kanjar De{1}, Nosheen Abid{1}, Sumit Rakesh{1}, Johan Eriksson{3}, Oliver Watts{2}, Xi Chen{4}, Damien Coyle{4}, Mohammad Golbabae{4}, Michael Proulx{4}
{1}Luleå University of Technology, Sweden; {2}SpeakUnique Ltd., United Kingdom; {3}Umeå University, Sweden; {4}University of Bath, Sweden; {4}University of Bath, United Kingdom
Poster Board: 39
ID: 7159
**CEBRA Method: Decoding Brain Activity for Advanced Brain-Computer Interface Technology**
Jingcheng Yang{3}, Frank Kulwa{3}, Xuanwei Liu{2}, Yiqing Lu{4}, Yunfa Fu{1}, Guanglin Li{3}, Yaping Huai{4}, Xin Zhang{2}, Yongcheng Li{3}
{1}Kunming University of Science and Technology, China; {2}Shenzhen Dapeng New District Nanao People’s Hospital, China; {3}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {4}Shenzhen Longhua District Central Hospital, China
Poster Board: 40

ID: 7215
**Domain-Incremental Learning Framework for Continual Motor Imagery EEG Classification Task**
Dan Li, Hye-Bin Shin, Kang Yin, Seong-Whan Lee
Korea University, Korea
Poster Board: 41

ID: 7283
**Improving the Classification of Olfactory Brain-Computer Interface Responses by Combining EEG and EBG Signals**
Hubert Kasprzak{1}, Nina Niewińska{1}, Tomasz Komendziński{1}, Mihoko Otake-Matsuura{2}, Tomasz Rutkowski{2}
{1}Nicolaus Copernicus University, Poland; {2}Riken Corporation, Japan
Poster Board: 42

ID: 7335
**Facilitating Knowledge Transfer: An Approach for Matching Neural Patterns Between Motor Tasks**
Zhiwei Song, Xiang Zhang, Jieyuan Tan, Mingyi Wang, Yiwen Wang
Hong Kong University of Science and Technology, Hong Kong
Poster Board: 43

ID: 7381
**MEG Channel Selection Using Copula Entropy-Based Transfer Entropy for Motor Imagery BCI**
Chao Tang, Dongyao Jiang, Badong Chen
Xi’an Jiaotong University, China
Poster Board: 44

ID: 7385
**Towards Optimising EEG Decoding Using Post-Hoc Explanations and Domain Knowledge**
Param Rajpura, Yogesh Kumar Meena
Indian Institute of Technology Gandhinagar, India
Poster Board: 45
ID: 7387
Exploring the Relationship Between Imitated and Associated Mechanism on Performance of Visual Imagery Brain-Computer Interface
Pengrui Tai{1}, Jingcheng Yang{2}, Shaowen Qi{1}, Guanglin Li{2}, Yunfa Fu{1}, Yongcheng Li{2}  
{1}Kunming University of Science and Technology, China; {2}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China  
Poster Board: 46

ID: 7410
Refined Force Estimation in Monkey’s Pinching Tasks Through Integrated EMG and ECoG Data: A Kalman Filter Method
Kohei Umezawa{1}, Takashi Isezaki{1}, Kengo Okitsu{1}, Osamu Yokoyama{2}, Michiaki Suzuki{2}, Yukio Nishimura{2}  
{1}NTT Corporation, Japan; {2}Tokyo Metropolitan Institute of Medical Science, Japan  
Poster Board: 47

ID: 7696
Classification of Emerging Neural Activity from Planning to Grasp Execution Using a Novel EEG-Based BCI Platform
Anna Cetera, Ali Rabiee, Sima Ghafoori, Yalda Shahriari, Reza Abiri  
University of Rhode Island, United States  
Poster Board: 48

ID: 7769
Enhancing Auditory BCI Performance: Incorporation of Connectivity Analysis
Talukdar Raian Ferdous, Luca Pollonini, Joseph Thachil Francis  
University of Houston, United States  
Poster Board: 49

ID: 7980
A Novel Real-Time Algorithm Based on Phase-Locked Data Alignment for Continuously Controlled SSVEP-BCI
Hanzhe Jiang, Xiaolin Xiao, Jie Mei, Minpeng Xu, Kun Wang, Dong Ming  
Tianjin University, China  
Poster Board: 50

ID: 8027
Guiding Brain-to-Vocalization Decoder Design Using Structured Generalization Error
Jingya Huang, Pablo Tostado-Marcos, Sowmya Manojna Narasimha, Aashish N. Patel, Ezequiel. M. Arneodo, Timothy Q. Gentner, Gal Mishne, Vikash Gilja  
University of California, San Diego, United States  
Poster Board: 51
**Wednesday Poster Session - Cardiac Electrophysiology**

3:30:00 PM - 5:00:00 PM  
*Room: Veracruz Hall*

**ID: 7186**  
**Presence of Mid-Myocardial Fibrosis in Ventricular Endocardial Electrograms Is Related to Power of Patient-Specific Frequency Bands**  
Taylor Baum{3}, John Whitaker{2}, Usha Tedrow{1}  
{1}Brigham and Women’s, United States; {2}King’s College London, United States; {3}Massachusetts Institute of Technology, United States  
Poster Board: 52

**ID: 7365**  
**Autoencoder-Based Arrhythmia Detection Using Synthetic ECG Generation Technique**  
Ali Nawaz, Mubarak Albarka Umar, Khaled Shuaib, Amir Ahmad, Abdelkader Nasreddine Belkacem  
United Arab Emirates University, U.A.E.  
Poster Board: 53

**ID: 7439**  
**Local Activation Identification in Persistent Atrial Fibrillation Intracardiac EGM Signals for Automatic Spatio-Temporal Dispersion Pattern Recognition**  
Sara Frusone{3}, Rafael Costa De Almeida{1}, Fabien Squara{2}, Vicente Zarzoso{3}  
{1}Federal University of Espirito Santo, Brazil; {2}Nice Pasteur University Hospital, France; {3}Université Côte d’Azur, CNRS, I3S Laboratory, France  
Poster Board: 54

**ID: 7843**  
**Discrimination Between RA and LA Sinus Rhythms Using Machine Learning Approach**  
Yuxuan Du{2}, Xiangzhen Kong{2}, Jason A. Tri{1}, Christopher V. DeSimone{1}, Elena G. Tolkacheva{2}  
{1}Mayo Clinic, United States; {2}University of Minnesota Twin Cities, United States  
Poster Board: 55

**ID: 7866**  
**Risk of VF Undersensing in Extra-Vascular ICD Due to Concomitant Leadless Pacing**  
Alfonso Aranda Hernandez{1}, G. Stuart Mendenhall{2}, Xusheng Zhang{1}, Tim Ebeling{1}  
{1}Medtronic, United States; {2}Scripps Memorial Hospital La Jolla, United States  
Poster Board: 56
ID: 6752
**Noise Effect Analysis and Pulmonary Perfusion Estimation in Electrical Impedance Tomography**
Marcus Victor Jr.{2}, Gabriel Pardini{1}, Monica Matsumoto{3}, Yi Xin{2}, Harki Tanaka{1}, Maurizio Cereda{2}
{1}Aeronautics Institute of Technology, Brazil; {2}Massachusetts General Hospital, United States; {3}Stanford University, United States
Poster Board: 57

ID: 6837
**Advancing EEG/MEG Source Imaging with Geometric-Informed Basis Functions**
Song Wang, Chen Wei, Kexin Lou, Dongfeng Gu, Quanying Liu
Southern University of Science and Technology, China
Poster Board: 58

ID: 7489
**Time-Domain and 3D Methods for Lung Perfusion Data Clustering in Electrical Impedance Tomography**
Marcus Victor Jr.{2}, Arthur Ribeiro{1}, Monica Matsumoto{3}, Yi Xin{2}, Harki Tanaka{1}, Maurizio Cereda{2}
{1}Aeronautics Institute of Technology, Brazil; {2}Massachusetts General Hospital, United States; {3}Stanford University, United States
Poster Board: 59

ID: 7558
**Evaluating EIT, hdEEG, and iPhone Electrode Localization for Stroke Applications**
Ethan Murphy, Alicia Everitt, Haley Richards, Yinchen Song, Erik Kobylarz, Timothy Lukovits, Diana Rojas-Soto, Ryan Halter
Dartmouth College, United States
Poster Board: 60

ID: 7758
**Portable EIT System Validation with a FEM Model-Based Resistance Phantom**
Fabian Alvarado, Bruno Fernández, Samuel Rebolledo, Esteban Pino
Universidad de Concepción, Chile
Poster Board: 61

ID: 7920
**Evaluating an Impedance-Based Smart Drill System in a Preliminary Human Cadaver Model**
Safina Suratwala, Alicia Everitt, Michael Salin, Ryan Halter
Rytek Medical, Inc, United States
Poster Board: 62
Technical Program – Wednesday, July 17\textsuperscript{th}

ID: 7992
**Improved Anomaly Characterization in Biological Tissues Through Relative Permittivity Estimation**
Raj Rakshit, Anwesha Khasnobish, Annesha Mazumder, Tapas Chakravarty
Tata Consultancy Services Limited, India
Poster Board: 63

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**Wednesday Poster Session - Human Motor Control Analysis with Musculoskeletal & Motor Control Models**
3:30:00 PM - 5:00:00 PM
*Room: Veracruz Hall*

ID: 6373
**Quantitative Measurement and Analysis of Whole Body Movement in Rehabilitation Sport**
Masanari Murai\(^1\), Masato Takahashi\(^1\), Chawan Koopipat\(^2\), Norimichi Tsumura\(^1\)
\(^1\)Chiba University, Japan; \(^2\)Chulalongkorn University, Thailand
Poster Board: 64

ID: 6482
**Modelling Based Approach Towards Evaluation and Selection of Ankle Foot Orthosis for Crouch Gait**
Oishee Mazumder, Tarannum Perween, Aniruddha Sinha
Tata Consultancy Services Limited, India
Poster Board: 65

ID: 6484
**Surrogate Simulation of Subject-Specific Lateral Pinch via Deep Learning**
Erica Lindbeck, Maximillian Diaz, Jennifer Nichols, Joel Harley
University of Florida, United States
Poster Board: 66

ID: 6757
**Ankle-Foot Orthoses Affect Spatio-Temporal Gait Parameters in Foot Drop Patients**
Armando Coccia, Federica Amitrano, Anna De Rosa, Gaetano Pagano, Ernesto Losavio, Giovanni D’Addio
Istituti Clinici Scientifici Maugeri IRCCS, Italy
Poster Board: 67

ID: 6758
**Custom Ankle-Foot Orthosis in Foot Drop: Influence on Body Joints Kinematics**
Federica Amitrano, Armando Coccia, Federico Colelli Riano, Gaetano Pagano, Vito Marsico, Giovanni D’Addio
Istituti Clinici Scientifici Maugeri IRCCS, Italy
Poster Board: 68
Technical Program – Wednesday, July 17th

ID: 7450
Degree of Active Recovery for Muscle Fatigue Following Load Reduction: Active Recovery in Force Generation and Electromyographic Manifestations
Woojin Yoon, Yunbeom Nam, Gwanseob Shin
Ulsan National Institute of Science and Technology, Korea
Poster Board: 69

ID: 7481
Towards Markerless Motion Estimation of Human Functional Upper Extremity Movement
Daniel Delannes-Molka, Kyle Jackson, Erica King, Zoran Duric
George Mason University, United States
Poster Board: 70

ID: 7697
Clustering of Infant Poses as a Novel Metric of Data Diversity for Automated General Movement Assessments Applications
Manpreet Kaur{2}, Hamid Abbasi{2}, Sîan Williams{2}, Malcolm Battin{1}, Thor Besier{2}, Angus McMorland{2}
{1}Auckland City Hospital, New Zealand; {2}University of Auckland, New Zealand
Poster Board: 71

ID: 8012
Anticipatory Gaze Dynamics in Human-to-Human Object Handover
Mateusz Wolak{1}, Garrit Strenge{1}, Yunus Bicer{1}, Kyle Lockwood{1}, Marisuz Furmanek{2}, Taskin Padir{1}, Mathew Yarossi{1}, Deniz Erdoğmuş{1}, Eugene Tunik{1}
{1}Northeastern University, United States; {2}University of Rhode Island, United States
Poster Board: 72

ID: 8045
Real-Time Classification of Diverse Reaching Motions Using RMS and Discrete Wavelet Transform Energy Values from EMG Signals for Human Assistive Robots
Yue Hou, Satoshi Nishikawa, Kazuo Kiguchi
Kyushu University, Japan
Poster Board: 73

Wednesday Poster Session - Image Enhancement, Compression, Reconstruction & Visualization
3:30:00 PM - 5:00:00 PM
Room: Veracruz Hall

ID: 6274
Denoising Echocardiography with an Improved Diffusion Model
Anparasy Sivaanpu, Michelle Noga, Harald Becher, Kumaradevan Punithakumar, Lawrence H Le
University of Alberta, Canada
Poster Board: 74
Technical Program – Wednesday, July 17th

ID: 6318
Visualization of Surgical Needle Tips Hidden Inside Organs Using Generative Adversarial Networks
Shoko Memida, Satoshi Miura
Tokyo Institute of Technology, Japan
Poster Board: 75

ID: 6546
Exploring Microwave Bone Imaging: Preliminary Reconstructions of Realistic Calcaneus Phantoms in Experimental Settings for Bone Health Monitoring
Alessia Cannatà{1}, Adnan Elahi{2}, Martin O’Halloran{2}, Marco Pasian{1}, Simona Di Meo{1}, Giulia Matrone{1}, Bilal Amin{2}
{1}Università degli Studi di Pavia, Italy; {2}University of Galway, Ireland
Poster Board: 76

ID: 6646
SEGSRNet for Stereo-Endoscopic Image Super-Resolution and Surgical Instrument Segmentation
Mansoor Hayat{1}, Supavadee Aramvith{1}, Titipat Achakulvisut{2}
{1}Chulalongkorn University, Thailand; {2}Mahidol University, Thailand
Poster Board: 77

ID: 6685
Interactive Manipulation and Visualization of 3D Brain MRI for Surgical Training
Zichen Gui{2}, Siddharth Jha{2}, Benjamin Delbos{1}, Richard Moreau{1}, Rémi Chalard{1}, Arnaud Lelevé{1}, Irene Cheng{2}
{1}INSA Lyon, France; {2}University of Alberta, Canada
Poster Board: 78

ID: 6750
Multiband Group Independent Component Analysis: Unveiling Frequency-Dependent Dynamics of Functional Connectivity in Group-Level fMRI Analyses
Neda Behzadfar, Armin Iraji, Vince D. Calhoun
TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board: 79

ID: 6848
High-Quality Medical Image Generation from Free-Hand Sketch
Quan Huu Cap, Atsushi Fukuda
Aillis, Inc., Japan
Poster Board: 80

ID: 7009
Neural Radiance Fields for Novel View Synthesis in Monocular Gastroscopy
Zijie Jiang{2}, Yusuke Monno{2}, Masatoshi Okutomi{2}, Sho Suzuki{1}, Kenji Miki{3}
{1}International University of Health and Welfare Ichikawa Hospital, Japan; {2}Tokyo Institute of Technology, Japan; {3}Tsujinaka Hospital Kashiwano, Japan
Poster Board: 81
ID: 7937
**3D Vessel Visualization Techniques for Dialysis Fistulae**
Yu-Chi Chen{1}, Chiu-Yang Lee{3}, Tai-Wei Chen{3}, Jie-Shi Tsai{1}, Tsaipei Wang{2}
{1}National Chiao Tung University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan; {3}Taipei Veterans General Hospital, Taiwan
Poster Board: 82

ID: 8041
**View Synthesis of Endoscope Images by Monocular Depth Prediction and Gaussian Splatting**
Takeshi Masuda{3}, Ryusuke Sagawa{3}, Ryo Furukawa{1}, Hiroshi Kawasaki{2}
{1}Kindai University, Japan; {2}Kyushu University, Japan; {3}National Institute of Advanced Industrial Science and Technology, Japan
Poster Board: 83

ID: 6394
**Dimension Reduction Based on Grouped Feature Selection Strategy for Fluorescence Molecular Tomography**
Linxin Li{2}, Lizhi Zhang{2}, Yizhe Zhao{2}, Qiong Xie{1}, Xiaowei He{2}, Xulei He{2}, Huangjian Yi{2}
{1}First Hospital of Hunan University of Chinese Medicine, China; {2}Northwest University, China
Poster Board: 84

ID: 7498
**DACVNet: Dual Attention Concatenation Volume Net for Stereo Endoscope 3D Reconstruction**
Rahul GS, Shubham Sharma, Preejith SP, Mohanasankar Sivaprakasam
*Indian Institute of Technology Madras, India*
Poster Board: 85

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**Wednesday Poster Session - Machine Learning in Healthcare & Human Activities**
3:30:00 PM - 5:00:00 PM  
Room: Veracruz Hall

ID: 6187
**Deep STI: Deep Stochastic Time-Series Imputation on Electronic Health Records**
Ming-Che Cheng{3}, Yi-Hsien Hsieh{1}, Te-Cheng Hsu{3}, Tung-Hung Su{2}, Che Lin{1}
{1}National Taiwan University, Taiwan; {2}National Taiwan University Hospital, Taiwan; {3}National Tsing Hua University, Taiwan
Poster Board: 86

ID: 6277
**Deep Learning-Based Subject Independent Human Activity Recognition Using Smart Lacelock Data**
Najmeh Movahhed Neya, Edward Sazonov, Xiangrong Shen
*University of Alabama, United States*
Poster Board: 87
Technical Program – Wednesday, July 17th

ID: 6463
**Time to Hypoglycemia Prediction for Personalized Diabetes Care and Management**
Jennifer Daniel Onwuchekwa{3}, Beyza Cinar{3}, Louisa van Den Boom{1}, Maria Maleshkova{2}
{1}Division of Pediatric Diabetology, DRK Hospital, Kirchen, Germany; {2}Helmut-Schmidt-Universität/Universität der Bundeswehr Hamburg, Germany; {3}Universität Siegen, Germany
Poster Board: 88

ID: 6920
**Non-Invasive Stroke Diagnosis Using Speech Data from Dysarthria Patients**
Sae Byeol Mun{2}, Young Jae Kim{1}, Kwang Gi Kim{1}
{1}Gachon University, Korea; {2}GAIHST, Gachon University, Korea
Poster Board: 89

ID: 7227
**Improving Prediction of Need for Mechanical Ventilation Using Cross-Attention**
Anwesh Mohanty, Supreeth Shashikumar, Jonathan Lam, Shamim Nemati
University of California, San Diego, United States
Poster Board: 90

ID: 7407
**Multimodel Lightweight Transformer Framework for Human Activity Recognition**
Wen Qi{2}, Chengwei Lin{2}, Kun Qian{1}
{1}Beijing Institute of Technology, China; {2}South China University of Technology, China
Poster Board: 91

ID: 7438
**Spatio-Temporal Transformer with Hypergraph in Nursing Activity Recognition**
Xinyue Li{2}, Jiaqing Liu{2}, Yu Wang{1}, Jien Kato{2}
{1}Hitotsubashi University, Japan; {2}Ritsumeikan University, Japan
Poster Board: 92

ID: 7750
**Diagnosis of Pneumoconiosis with Machine Learning**
Viviana Hanampa{2}, Jonh Astete{4}, Benjamin Castañeda Aphan{3}, Stefano Enrique Romero Gutierrez{1}
{1}Laboratorio de Imágenes Médicas, Pontificia Universidad Católica del Perú, Peru; {2}Pontificia Universidad Católica del Perú, Peru; {3}Pontificia Universidad Católica del Perú, University of Rochester, Peru; {4}Universidad Peruana Cayetano Heredia, Peru
Poster Board: 93
High-Rate Emphasized DeepLabV3Plus for Semantic Segmentation of Breast Cancer-Related Hematoxylin and Eosin-Stained Images
Sanghoon Lee{1}, Yanjun Zhao{3}, Wookjin Choi{2}
{1}Kennesaw State University, United States; {2}Thomas Jefferson University, United States; {3}Troy University, United States
Poster Board: 94

Multiparametric Analysis in Knee MRI for an Early Detection of Osteoarthritis Biomarkers
Alberto Roca-Ginés{2}, Juan Antonio Romero-Martín{1}, Pilar Castellote-Huguet{1}, Ana Vallès-Lluch{1}, José Manuel Santabárbara{1}, Alicia M. Maceira{1}, David Moratal{2}
{1}ASCIRES Biomedical Group, Spain; {2}Universitat Politècnica de València, Spain
Poster Board: 95

Endoscopic Colorectal Polyp Detection Based on Improved YOLOv8
Jincai Huang, Jianyuan Zeng, Jinfeng Peng, Mengye Lyu, Shaojun Liu
Shenzhen Technology University, China
Poster Board: 96

Generating Realistic Cardiac MR Images Using Diffusion Models
Javier Urcia-Vázquez{3}, Manuel Pérez-Pelegrí{2}, José Vicente Monmeneu{1}, María Pilar López-Lereu{1}, José Manuel Santabárbara{1}, Alicia M. Maceira{1}, David Moratal{3}
{1}ASCIRES Biomedical Group, Spain; {2}Lincbiotech, S.L., Spain; {3}Universitat Politècnica de València, Spain
Poster Board: 97

Open Set Medical Diagnosis via Difficulty-Aware Multi-Label Thorax Disease Classification
Kyungdeuk Ko, Bokyung Lee, Jonghwan Hong, Hanseok Ko
Korea University, Korea
Poster Board: 98

Enhancing Few-Shot Chest X-Ray Classification Through Generative Class Augmentation
Pei-Chuan Lin{2}, Po-Chih Kuo{2}, Chia-Jung Liu{1}, Meng-Rui Lee{1}
{1}National Taiwan University Hospital, Taiwan; {2}National Tsing Hua University, Taiwan
Poster Board: 99
**Technical Program – Wednesday, July 17th**

ID: 6252  
**Elbow Joint Classification for Total Elbow Arthroplasty**  
Jun Wang{4}, Yongxing Zhang{2}, Xiying Ding{3}, Xiao Ma{4}, Chen Peng{1}, Junxiao Xue{4}, Feng Lin{4}, Yan Wu{2}, Qing Zhang{4}  
{1}Research Institute of Artificial Intelligence, Zhejiang Lab, China; {2}Second Affiliated Hospital Zhejiang University School of Medicine, China; {3}Sir Run Run Shaw Hospital, Zhejiang University, China; {4}Zhejiang Lab, China  
Poster Board: 100

ID: 6322  
**Automated Brain Atrophy Quantification and Evaluation Using Spatial Resolution Enhancement**  
Yonglai Zuo{1}, Xiaohan Hao{2}, Mengdie Song{1}, Fulang Qi{2}, Bensheng Qiu{1}, Xiaoxiao Wang{1}  
{1}University of Science and Technology of China, China; {2}University of Science and Technology of China, Fuqing Medical Co., Ltd., China  
Poster Board: 101

ID: 6372  
**An Automatic Method for Locating Positions and Their Colors Important for Classifying Genders in Retinal Fundus Images by Deep Learning Models**  
Shota Tsutsui{2}, Ichiro Maruko{1}, Moeko Kawai{1}, Yoichi Kato{2}, Jun Ohya{2}  
{1}Tokyo Women’s Medical University, Japan; {2}Waseda University, Japan  
Poster Board: 102

ID: 6628  
**A Multivariate Exploration of Resting-State Networks and Sensory Measures of Olfaction and Taste**  
Behnaz Jarrahi  
Stanford University, United States  
Poster Board: 103

ID: 6661  
**Redefining the Classification of Extravasation Severity Using CLIP Linear Probe with Few-Shot Instances**  
Adirek Munthuli{2}, Matthew Thepsoparn{1}, Pakinee Pooprasert{2}, Phongphan Phienphanich{2}, Padcha Pongcharoen{2}, Dussadee Sakonlaya{2}, Pratanna Sittiwanawong{2}, Sinee Weschawalit{2}, Panlop Chakkavitumrong{2}, Borwarmluck Thongthawee{2}, Thitipor {1}Bangkok Patana School, Thailand; {2}Thammasat University, Thailand  
Poster Board: 104

ID: 6664  
**Fundus-Based RNFL Quadrant Map Generation Using Depth Estimation**  
Sirikorn Sangchocanonta{3}, Kanyarak Patchimnan{2}, Pakinee Pooprasert{3}, Adirek Munthuli{3}, Sujitta Puangarom{3}, Phongphan Phienphanich{3}, Rath Itthipanichpong{1}, Kitiya Ratanawongphaibul{1}, Sunee Chansangpetch{1}, Anita Manassakorn{1}, Visanee Ta  
{1}Chulalongkorn University, Thailand; {2}KIS International School, Thailand; {3}Thammasat University, Thailand  
Poster Board: 105
ID: 6667
Enhanced RNFL Thickness Estimation with Cost Function Approach from Fundus Images via TSNIT Graph Mapping
Sujittra Puangarom{3}, Natchanid Vongsurakrai{2}, Pakinee Pooprasert{3}, Sirikorn Sangchocanonta{3}, Adirek Munthuli{3}, Phongphan Phienphanich{3}, Rath Itthipanichpong{1}, Kitiya Ratanawongphaibul{1}, Sunee Chansangpetch{1}, Anita Manassakorn{1}, Visanee {1}Chulalongkorn University, Thailand; {2}Shrewsbury International School Bangkok, Thailand; {3}Thammasat University, Thailand
Poster Board: 106

ID: 6748
Improving Fairness in Chest X-Ray Interpretation Models Using Attention-Driven Masked Image Modeling
Chao-Ju Chen, Stephanie Wang, Po-Chih Kuo
National Tsing Hua University, Taiwan
Poster Board: 107

ID: 6774
Counterfactual MRI Generation with Denoising Diffusion Models for Interpretable Alzheimer’s Disease Effect Detection
Nikhil Dhinagar, Sophia I. Thomopoulos, Emily Laltoo, Paul M. Thompson
University of Southern California, United States
Poster Board: 108

ID: 6797
Variations in Regional Characteristics of Interstitial Cells of Cajal in the Murine Stomach
Recep Avci{2}, Peng Du{2}, Jean-Marie Vanderwinden{1}, Leo Cheng{2}
{1}Université Libre de Bruxelles, Belgium; {2}University of Auckland, New Zealand
Poster Board: 109

ID: 6806
Multi-Level Fusion of FDG PET and MRI for Automated Epileptic Lesion Detection
Zijun Wu{2}, Haiqing Zhang{2}, Siyu Yuan{2}, Jiwei Li{2}, Hui Huang{2}, Miao Zhang{1}, Jie Luo{2}
{1}Ruijin Hospital, Shanghai Jiao Tong University, China; {2}Shanghai Jiao Tong University, China
Poster Board: 110

ID: 6834
Evaluation of Depth-Wise Separable Convolution and Channel Attention Mechanism to Bacilli Segmentation
Ronaldo Soares, Felipe Monteiro, Gabriel Pinheiro, Mikaela Serrão, Cícero F. F. Costa Filho, Marly G. F. Costa
Universidade Federal do Amazonas, Brazil
Poster Board: 111
ID: 6842
Advancing Medical Imaging: A Domain-Adaptive Approach to Distinguish Lung Cancer and Pulmonary Cryptococcosis
Huanlong Gao{2}, Borui Zhu{2}, Shuai Zhang{2}, Xuelei He{2}, Yanwei Chen{1}
{1}First Affiliated Hospital of Guangzhou Medical University, China; {2}Northwest University, China
Poster Board: 112

ID: 6880
Dynamic Functional Network Connectivity Clustering and Harmonization Evaluation Metric
Biozid Bostami, Noah Lewis, Victor Vergara, Vince D. Calhoun
TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board: 113

ID: 6904
Deep Learning Method for Estimating Germ-Layer Regions of Early Differentiated Human Induced Pluripotent Stem Cells on Micropattern Using Bright-Field Microscopy Image
Slo-Li Chu{1}, Hideo Yokota{2}, Pai-Ting Wang{1}, Kuniya Abe{2}, Yoheï Hayashi{2}, Dooseon Cho{2}, Ming-Dar Tsai{1}
{1}Chung-Yuan Christian University, Taiwan; {2}Riken Corporation, Japan
Poster Board: 114

ID: 6952
Hard Example Mining in Multi-Instance Learning for Whole-Slide Image Classification
Xianglong Du{2}, Jiaqi Guo{2}, Zehang Xing{2}, Miao Liu{2}, Zhengyang Xu{2}, Chenglin Ruan{1}, Yuting Wen{3}, Yi Wang{3}, Lei Cui{2}, Hansheng Li{2}
{1}Hospital of Stomatology, Xi'an Jiaotong University, China; {2}Northwest University, China; {3}Xi'An No.9 Hospital, China
Poster Board: 115

ID: 6976
Orthopedic Implant Fixation Type Detection in Hip Arthroplasty Using Two-Staged Low-Shot Network
Aparna Kanakatte Gurumurthy, Divya Bhatia, Rupsha Mukherjee, Murali Poduval, Aniruddha Sinha, Avik Ghose
Tata Consultancy Services Limited, India
Poster Board: 116

ID: 7059
Improving Endoscopy Lesion Classification Using Self-Supervised Deep Learning
Inês Lopes{2}, Maria Vakalopoulou{3}, Enzo Ferrante{3}, Diogo Libânio{1}, Mário Dinis-Ribeiro{1}, Miguel Coimbra{2}, Francesco Renna{2}
{1}CIDES/CINTEESIS, University of Porto, Portugal; {2}INESC TEC, Universidade do Porto, Portugal; {3}MICS, Centrale Supélec, University Paris-Saclay, France
Poster Board: 117
ID: 7125
**Brain Community Detection in the General Children Population**
Britny Farahdel{1}, Bishal Thapaliya{1}, Pranav Suresh{1}, Bhaskar Ray{1}, Vince D. Calhoun{2}, Jingyu Liu{1}
{1}TReNDS Center, Georgia State University, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board: 118

ID: 7199
**Enhancing Prognostic Prediction of Gastrointestinal Stromal Tumors Using Semi-Supervised Regression Based on CT Imaging Data**
Hailin Li{1}, Mengjie Fang{1}, Bingxi He{1}, Di Dong{2}, Jie Tian{1}
{1}Beihang University, China; {2}Institute of Automation, Chinese Academy of Sciences, China
Poster Board: 119

ID: 7363
**Leveraging Vision Transformers for Enhanced Accuracy in Pneumonia Detection from Medical Imaging Data**
Kanishka Ranaweera, Pubudu N. Pathirana
Deakin University, Australia
Poster Board: 120

ID: 7422
**Domain Generalization for Multi-Disease Detection in Fundus Photographs**
Sarah Matta{6}, Mathieu Lamard{6}, Laurent Borderie{1}, Alexandre Le Guilcher{1}, Pascale Massin{4}, Jean-Bernard Rottier{3}, Béatrice Cochener{5}, Gwenolé Quellec{2}
{1}Évolucare Technologies, France; {2}INSERM, France; {3}Pôle Santé Sud CMCM, France; {4}Service d'Ophtalmologie, Hôpital Lariboisière, APHP, France; {5}Service d'Ophtalmologie, CHRU Brest, France; {6}Université de Bretagne Occidentale, France
Poster Board: 121

ID: 7467
**Grade Classification of Nasal Obstruction from Endoscopy Videos Using Machine Learning**
Nonpawith Phoommanee{2}, Peter Andrews{1}, Terence Leung{2}
{1}Royal National Throat, Nose and Ear Hospital, United Kingdom; {2}University College London, United Kingdom
Poster Board: 122

ID: 7487
**A BCLC Staging System for Hepatocellular Carcinoma Using Swin Transformer and CT Imaging**
Shun-Cheng Chang{1}, Pochuang Wang{1}, Weichung Wang{1}, Tung-Hung Su{2}, Jia-Horng Kao{2}, Che Lin{1}
{1}National Taiwan University, Taiwan; {2}National Taiwan University Hospital, Taiwan
Poster Board: 123
ID: 7624
**Machine Learning Exploration of Brain Morphological Features and Sensory Measures**
Behnaz Jarrahi
Stanford University, United States
Poster Board: 124

ID: 7630
**An Anomaly Self-Supervised Representation to Classify Malignant Lung Nodules**
Josué D. Rodríguez{2}, Alejandra Moreno{1}, Fabio Martínez Carrillo{2}
{1}Industrial University of Santander, Colombia; {2}Universidad Industrial de Santander, Colombia
Poster Board: 125

ID: 7709
**Beyond Dysplasia: Uncovering Structure in Oral Potentially Malignant Diseases with Unsupervised Contrastive Learning**
Kayla Caughlin{3}, Rodrigo Cuenc Martinez{2}, Gabriel Tortorelli{2}, Yi-Sheng Cheng{1}, Rashmi Hegde{1}, Celeste Abraham{1}, Jacqueline Plemons{1}, Ying Wang{1}, Victoria Woo{1}, Javier Jo{2}, Carlos Busso{3}
{1}Texas A&M School of Dentistry, United States; {2}University of Oklahoma, United States; {3}University of Texas at Dallas, United States
Poster Board: 126

ID: 7719
**Detection of Peri-Pancreatic Edema Using Deep Learning and Radiomics Techniques**
{1}Indiana University, United States; {2}Machine & Hybrid Intelligence Lab, Northwestern University, United States; {3}National Institutes of Health, United States; {4}Northwestern University, United States; {5}University of Illinois Chicago, United States
Poster Board: 127

ID: 7792
**Unsupervised Anomaly Detection by Learning Elastic Transformations Within an Autoencoder Approach**
Andres Jiménez-Garcia{3}, Hernán Felipe García Arias{2}, David Augusto Cárdenas-Peña{3}, Wilfor Andrés Cárdenas-Bedoya{3}, Gloria Liliana Porras-Hurtado{1}, Álvaro Ángel Orozco-Gutiérrez{3}
{1}Comfamiliar Risaralda, Colombia; {2}Universidad de Antioquia, Colombia; {3}Universidad Tecnológica de Pereira, Colombia
Poster Board: 128

ID: 7869
**Critical View of Safety Assessment in Laparoscopic Cholecystectomy via Segment Anything Model**
Yunfan Li{1}, Haibin Ling{1}, IV Ramakrishnan{1}, Prateek Prasanna{1}, Aaron Sasson{2}, Himanshu Gupta{1}
{1}Stony Brook University, United States; {2}Stony Brook University Hospital, United States
Poster Board: 129
Technical Program – Wednesday, July 17th

ID: 7932
**Breast Cancer Tissue Classification from Multiple Annotators Using Chained Deep Learning Approaches**
Andrés Felipe Valencia-Duque, David Augusto Cárdenas-Peña, Julián Gil-González, Álvaro Ángel Orozco-Gutiérrez, Genaro Daza-Santacoloma
Universidad Tecnológica de Pereira, Colombia
Poster Board: 130

ID: 7933
**UPMatch: Enhancing Semi-Supervised Medical Image Classification Through Contrastive Learning with Unreliable Pseudo Labels**
Jihong Hu{1}, Yinhao Li{1}, Lanfen Lin{2}, Yen-Wei Chen{1}
{1}Ritsumeikan University, Japan; {2}Zhejiang University, China
Poster Board: 131

ID: 8020
**A Multi-Branch Attention-Based Deep Learning Method for Als Identification with sMRI Data**
Jiashu Guo{3}, Deyuan Chen{3}, Xiangzhu Zeng{1}, Xiaoxuan Liu{1}, Xujian Wang{2}, Shenghua Teng{2}, Kai Ye{1}, Xingwen Sun{1}, Shuo Zhang{1}, Ji He{1}, Dongsheng Fan{1}, Yan Liu{3}
{1}Peking University Third Hospital, China; {2}Shandong University of Science and Technology, China; {3}University of Chinese Academy of Sciences, China
Poster Board: 132

ID: 8082
**Dual Attention Graph Convolutional Network Fusing Imaging and Genetic Data for Early Alzheimer’s Disease Diagnosis**
Jiaqiang Li{2}, Peng Yang{2}, Junlong Qu{2}, Bao Yang{2}, Zhenghua Guan{2}, Xuegang Song{2}, Xiaohua Xiao{1}, Tianfu Wang{2}, Baiying Lei{2}
{1}Affiliated Hospital of Shenzhen University, China; {2}Shenzhen University, China
Poster Board: 133

ID: 7411
**Predicting the Cell-Level PD-L1 Expression Status from H&E-Stained Histopathological Slide**
Mo Zhou{1}, Hansheng Li{1}, Zhizezhang Gao{1}, Mengxin Lu{2}, Xiao Zhang{1}, Yuxin Kang{1}, Lei Cui{1}, Jun Feng{1}, Lin Yang{1}
{1}Northwest University, China; {2}Yuncheng Central Hospital, China
Poster Board: 134

**Wednesday Poster Session - Neural Signal Processing & Brain Imaging 1**
3:30:00 PM - 5:00:00 PM
Room: Veracruz Hall

ID: 6057
**TAnet: A New Temporal Attention Network for EEG-Based Auditory Spatial Attention Decoding with a Short Decision Window**
Yuting Ding, Fei Chen
Southern University of Science and Technology, China
Poster Board: 135
ID: 6074
**Identifying Critical Nodes in the Cognitive Decline Process Through EEG Network Community Detection Based on Autoencoder**
Jingnan Sun{4}, Meng Liu{2}, Anruo Shen{4}, Xiaogang Chen{1}, Xiaorong Gao{4}, Yunxia Li{3}
{1}Chinese Academy of Medical Sciences, China; {2}Shanghai Pudong Hospital, China; {3}Tongji Hospital, China; {4}Tsinghua University, China
Poster Board: 136

ID: 6214
**Intended Speech Classification with EEG Signals Based on a Temporal Attention Mechanism: A Study of Mandarin Vowels**
Xinyu Wang{2}, Ying-Hui Lai{1}, Fei Chen{2}
{1}National Yang Ming Chiao Tung University, Taiwan; {2}Southern University of Science and Technology, China
Poster Board: 137

ID: 6261
**Reverse Engineering the Brain Input: Network Control Theory to Identify Cognitive Task-Related Control Nodes**
Zhichao Liang, Yinuo Zhang, Jushen Wu, Quanying Liu
Southern University of Science and Technology, China
Poster Board: 138

ID: 6342
**A Non-Intrusive Neural Quality Assessment Model for Surface Electromyography Signals**
Cho-Yuan Lee{5}, Kuan-Chen Wang{4}, Kai-Chun Liu{6}, Yu-Te Wang{2}, Xugang Lu{3}, Ping-Cheng Yeh{4}, Yu Tsao{1}
{1}CITI, Academia Sinica, Taiwan; {2}CITI, Academia Sinica, Microsoft Research, Taiwan; {3}National Institute of Information and Communications Technology, Japan; {4}National Taiwan University, Taiwan; {5}National Yang Ming Chiao Tung University, Taiwan; {6}University of Massachusetts Amherst, United States
Poster Board: 139

ID: 6382
**Baseline Alpha Wave Predicts Post-Cue Alpha During Visual Spatial Attention with Linear Mixed Model**
Jiaqi Wang{1}, Jingyi Wang{1}, Jingyi Hu{1}, Junfeng Sun{1}, Chunbo Li{2}, Xiangfei Hong{2}, Shanbao Tong{1}
{1}Shanghai Jiao Tong University, China; {2}Shanghai Mental Health Center, China
Poster Board: 140

ID: 6431
**Method for Synthetic Generation of LFP Data for Testing of Feature Extraction Algorithms**
Heather Breidenbach{3}, Virginia Woods{3}, Uisub Shin{1}, Evan Dastin-van Rijn{3}, Mahsa Shoaran{2}, Alik Widge{3}
{1}Cornell University, École Polytechnique Fédérale de Lausanne, United States; {2}École Polytechnique Fédérale de Lausanne, United States; {3}University of Minnesota Twin Cities, United States
Poster Board: 141
ID: 6496
**Default Mode Network Detection Using EEG in Real-Time**
Navin Cooray{1}, Chetan Gohil{3}, Brendan Harris{4}, Shaun Frost{1}, Cameron Higgins{2}
{1}Commonwealth Scientific and Industrial Research Organisation, Australia; {2}Resonait, Australia; {3}University of Oxford, United Kingdom; {4}University of Sydney, Australia
Poster Board: 142

ID: 6657
**Adaptive Stepwise Feature Selection Approach for EEG-Based Epileptic Seizure Classification**
Sunday Timothy Aboyeji{7}, Wenfang Zhou{4}, Yuan Tao{5}, Mingxing Zhu{2}, Oluwarotimi Williams Samuel{8}, Ijaz Ahmad{7}, Guoru Zhao{7}, Ji Yi{3}, Michael Chi Fai Tong{9}, Xin Wang{7}, Yi Guo{6}, Shixiong Chen{1}
{1}Chinese University of Hong Kong, China; {2}Harbin Institute of Technology, China; {3}Johns Hopkins University, United States; {4}Luohu District People’s Hospital, China; {5}Peking University Shenzhen Hospital, China; {6}Shenzhen Bay Laboratory, Shenzhen People’s Hospital, China; {7}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {8}University of Derby, United Kingdom; {9}University of Hong Kong, Hong Kong
Poster Board: 143

ID: 6703
**Putative Heartbeat-Evoked Potentials in Rats and its Spatial Distribution in the Temporal Cortex**
Tomoyo Isoguchi Shiramatsu{2}, Shinichi Kumagai{1}, Karin Oshima{2}, Hirokazu Takahashi{2}
{1}Jichi Medical University, Japan; {2}University of Tokyo, Japan
Poster Board: 144

ID: 6762
**Multi-Modal Emotion Recognition Using EEG and Eye Tracking Features**
Paolo Iacono, Naimul Mefraz Khan
Toronto Metropolitan University, Canada
Poster Board: 145

ID: 6799
**Unsupervised Hybrid Deep Feature Encoder for Robust Feature Learning from Resting-State EEG Data**
Yuan Yue{2}, Jeremiah Deng{2}, Tapabrata Chakraborti{1}, Dirk De Ridder{2}, Patrick Manning{2}
{1}Alan Turing Institute and University College London, United Kingdom; {2}University of Otago, New Zealand
Poster Board: 146

ID: 6829
**Focused State Recognition Using EEG with Eye Movement-Assisted Annotation**
Tian-Hua Li, Tian-Fang Ma, Dan Peng, Wei-Long Zheng, Bao-Liang Lu
Shanghai Jiao Tong University, China
Poster Board: 147
Technical Program – Wednesday, July 17th

ID: 6853
**Multi-Modal Adversarial Regressive Transformer for Cross-Subject Fatigue Detection**
Mingyu Gou, Hao-Long Yin, Bao-Liang Lu, Wei-Long Zheng
Shanghai Jiao Tong University, China
Poster Board: 148

ID: 6871
**Bispectrum Analysis of Noninvasive EEG Signals Discriminates Complex and Natural Grasp Types**
Sima Ghafoori, Ali Rabiee, Anna Cetera, Yalda Shahriari, Reza Abiri
University of Rhode Island, United States
Poster Board: 149

ID: 6931
**A Dynamic Evaluation-Denoising Network for Motion Artifacts Removal from Single-Channel EEG**
Zhe Li, Kecheng Shi, Wenjiang Li, Fengjun Mu, Jingting Zhang, Rui Huang, Hong Cheng
University of Electronic Science and Technology of China, China
Poster Board: 150

ID: 6948
**A Multimodal Myanmar Emotion Dataset for Emotion Recognition**
Khin Pa Pa Aung, Hao-Long Yin, Tian-Fang Ma, Wei-Long Zheng, Bao-Liang Lu
Shanghai Jiao Tong University, China
Poster Board: 151

ID: 6967
**Improving Cross-Subject Emotion Recognition Performance with an Encoder-Decoder Structure**
Haowei Cui, Hanwen Shi, Bao-Liang Lu, Wei-Long Zheng
Shanghai Jiao Tong University, China
Poster Board: 152

ID: 7310
**Neural Mechanisms of Malodor Masking: A Wearable EEG Study**
Oranatt Chaichanasittikarn\{1\}, Jeremy Lin Weixuan\{1\}, Manuel Seet\{1\}, Desmond Ng\{2\}, Rahul Vyas\{2\}, Gaurav Saini\{2\}, Andrei Dragomir\{1\}
\{1\}National University of Singapore, Singapore; \{2\}Procter & Gamble Co, Singapore
Poster Board: 153

ID: 7510
**Tracking Single Units Across Time Using 16-Channel Microelectrode Arrays**
Eleanor Jeakle, Justin Abbott, Thomas Smith, Ana Guadalupe Hernandez-Reynoso, Stuart F. Cogan, Joseph J. Pancrazio
University of Texas at Dallas, United States
Poster Board: 154
Technical Program – Wednesday, July 17th

ID: 7570
**Evaluation of EEG and MEG Responses During Fine Motor Imagery from the Same Limb**
Rui Jiang{2}, Shuang Qiu{2}, Yu Wang{3}, Chuncheng Zhang{2}, Huiguang He{1}
{1}Institute of Automation, Chinese Academy of Sciences, China; {2}Laboratory of Brain Atlas and Brain-Inspired Intelligence, Chinese Academy of Sciences, China; {3}University of the Chinese Academy of Sciences, China
Poster Board: 155

ID: 7583
**Neural Source Reconstruction Using a Novel Ultra-High-Density EEG System and Vibrotactile Stimulation of Individual Fingers**
Leonhard Schreiner{2}, Sebastian Sieghartsleitner{1}, Fan Cao{3}, Harald Pretl{4}, Christoph Guger{1}
{1}g.tec medical engineering GmbH, Austria; {2}g.tec medical engineering GmbH, Johannes Kepler University Linz, Austria; {3}g.tec neurotechnology USA, Inc., United States; {4}Johannes Kepler University, Austria
Poster Board: 156

ID: 7665
**Automated Hyper-Parameter Optimization for Eye Movement Artifact Removal**
Daniel Comadurán-Márquez{1}, Araz Minhas{1}, Eli Kinney-Lang{2}, Adam Kirton{2}
{1}University of Calgary, Canada; {2}University of Calgary, Alberta Children's Hospital, Canada
Poster Board: 157

ID: 7681
**Characterization of Low Frequency Oscillations in Simple Hand Movements**
Elena Mongiardini{2}, Emma Colamarino{2}, Jlenia Toppi{2}, Floriana Pichiorri{1}, Donatella Mattia{1}, Febo Cincotti{2}
{1}Fondazione Santa Lucia IRCCS, Italy; {2}Sapienza Università di Roma, Fondazione Santa Lucia IRCCS, Italy
Poster Board: 158

ID: 7762
**Uncertainty Estimation and Model Calibration in EEG Signal Classification for Epileptic Seizures Detection**
Jiahao Hu{1}, Muhammad Mahboob Ur Ur Rahman{1}, Tareq Al-Naffouri{1}, Taous Meriem Laleg-Kirati{2}
{1}King Abdullah University of Science and Technology, Saudi Arabia; {2}National Institute for Research in Digital Science and Technology, France
Poster Board: 159

ID: 7919
**Channel Selection and Wavelet Transformation-Based Data Compression Preserve Motor Unit Information**
Siyu Wang{1}, Kiara Quinn{2}, Ariel Slepyan{1}, Lang Qin{1}, Nitish V. Thakor{1}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States
Poster Board: 160
Identifying Reproducibly Important EEG Markers of Schizophrenia with an Explainable Multi-Model Deep Learning Approach
Martina Lapera Sancho{1}, Charles Ellis{2}, Robyn L. Miller{2}, Vince D. Calhoun{2}
{1}TReNDS Center, Georgia State University, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States

Baseline-Guided Representation Learning for Noise-Robust EEG Signal Classification
Elissa Yanting Lim, Kang Yin, Hye-Bin Shin, Seong-Whan Lee
Korea University, Korea

Random Subset Multi-Domain Feature Extraction for Attentional State Recognition
Guiying Xu{1}, Zhenyu Wang{1}, Honglin Hu{1}, Xi Zhao{2}, Ruxue Li{4}, Ting Zhou{3}, Tianheng Xu{1}
{1}Shanghai Advanced Research Institute, Chinese Academy of Sciences, China; {2}Shanghai University, China; {3}Shanghai University, Shanghai Frontier Innovation Research, China; {4}ShanghaiTech University. Shanghai Advanced Research Institute, Chinese Academy of Sciences, China

Multi-Channel Neural Signal Recording System for an Implantable Brain-Computer Interface
Qingya Li, Zhiwei Zhang, Mingxia Shi, Xiaoyan Tao
Institute of Automation, Chinese Academy of Sciences, China

Machine Learning Approach for Music Familiarity Classification with Single-Channel EEG
Nahyeon Kim{1}, Debanjan Borthakur{2}, Manob Jyoti Saikia{1}
{1}University of North Florida, United States; {2}University of Toronto, Canada

Bi-Hemisphere Interaction Convolutional Neural Network for Motor Imagery Classification
Xiaohao Lin{2}, Emadeldeen Eldele{1}, Zhenghua Chen{1}, Min Wu{1}, Han Wei Ng{2}, Cuntai Guan{2}
{1}Agency for Science, Technology and Research, Singapore; {2}Nanyang Technological University, Singapore
ID: 7571
**Challenging Deep Learning Methods for EEG Signal Denoising Under Data Corruption**
Farzaneh Taleb, Miguel Vasco, Nona Rajabi, Mårten Björkman, Danica Kragic
*KTH Royal Institute of Technology, Sweden*
Poster Board: 167

ID: 7679
**Precision Enhancement in Sustained Visual Attention Training Platforms: Offline EEG Signal Analysis for Classifier Fine-Tuning**
Maryam Norouzi, Mohammad Zaeri Amirani, Yalda Shahriari, Reza Abiri
*University of Rhode Island, United States*
Poster Board: 168

ID: 6201
**Graph Propagation Network Captures Individual Connectivity-Function Relationship Through Predicting Functional Activation Based on Structural Connectivity**
Dongya Wu, Xin Li
*Northwest University, China*
Poster Board: 169

ID: 6224
**Neural Correlates of Speech Comprehension in Normal Hearing Individuals and Cochlear Implant Users - An fNIRS Study in Quiet and Noisy Environments**
András Bálint{2}, Wilhelm Wimmer{1}, Christian Rummel{2}, Marco Caversaccio{2}, Stefan Weder{2}
{1}Ludwig-Maximilians-Universität München, Germany; {2}University of Bern, Switzerland
Poster Board: 170

ID: 6227
**Connectome-Based Prediction of Individual Behaviors via Convolutional Graph Propagation Network**
Dongya Wu, Xin Li
*Northwest University, China*
Poster Board: 171

ID: 6639
**Acute Stress Disorder Detection Using Machine Learning Based on Resting-State fMRI**
Youngsun Kong, Andrew Peitzsch, Hugo F Posada-Quintero, Ki Chon
*University of Connecticut, United States*
Poster Board: 172

ID: 7061
**Functional Graph Image Representation Applied to EEG-Based Mental Workload Classification**
Maria Sarkis, Mira Rizkallah, Saïd Moussaoui
*Nantes Université, École Centrale Nantes, LS2N, CNRS, France*
Poster Board: 173
Technical Program – Wednesday, July 17th

ID: 7168
Uncovering Effects of Schizophrenia Upon a Maximally Significant, Minimally Complex Subset of Default Mode Network Connectivity Features
Masoud Seraji{2}, Charles Ellis{2}, Mohammad Sendi{1}, Robyn L. Miller{2}, Vince D. Calhoun{2}
{1}Harvard Medical School, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board: 174

ID: 7446
Patient-Involved Validation of a Somatosensory ERP-BCI Facilitated by Electric Stimulation for Stroke Rehabilitation
Junlin Wang{2}, Xiaodong Li{3}, Yaohui Huang{1}, Dongyi Xiao{1}, Yingjie Fan{1}, Wei Huang{1}, Yong Hu{2}
{1}Second Affiliated Hospital of Guangdong Medical University, China; {2}University of Hong Kong, Hong Kong; {3}University of Hong Kong–Shenzhen Hospital, China
Poster Board: 175

ID: 7790
Mental Fatigue Classification with High-Density Diffuse Optical Tomography: A Feasibility Study
Jianan Chen, Yunjia Xia, Alexander Thomas, Tom Carlson, Hubin Zhao
University College London, United Kingdom
Poster Board: 176

ID: 6436
Alteration of Cortical Somatosensory Feedback in Post-Stroke Movement Control
Rita Huan-Ting Peng{1}, Nishaal Parmar{2}, Jordan N. Williamson{1}, Parikshat Sirpal{2}, Beni E. Mulyana{1}, Mahmood Rajabtabar Darvish{1}, Joohwan Sung{1}, Evgeny V. Sidorov{3}, Yuan Yang{1}
{1}University of Illinois Urbana-Champaign, United States; {2}University of Oklahoma, United States; {3}University of Oklahoma Health Sciences Center, United States
Poster Board: 177

ID: 6898
Mandarin Speech Reconstruction from Tongue Motion Ultrasound Images Based on Generative Adversarial Networks
Fengji Li{1}, Fei Shen{1}, Ding Ma{3}, Shaochuang Zhang{1}, Jie Zhou{1}, Li Wang{1}, Fan Fan{1}, Tao Liu{1}, Xiaohong Chen{2}, Tomoki Toda{3}, Haijun Niu{1}
{1}Beihang University, China; {2}Beijing Tongren Hospital, Capital Medical University, China; {3}Nagoya University, Japan
Poster Board: 178

ID: 7093
Application of a Neural ODE to Classify Motion Control Strategy Using EEG
Liran Ziegelman, Manuel Hernandez
University of Illinois Urbana-Champaign, United States
Poster Board: 179
Technical Program – Wednesday, July 17th

ID: 7112
**Textured Stimuli Comfort and Response in SSVEP-Based Brain Computer Interface**
Emily Schrag{1}, Daniel Comadurán-Márquez{1}, Adam Kirton{2}, Eli Kinney-Lang{2}
{1}University of Calgary, Canada; {2}University of Calgary, Alberta Children's Hospital, Canada
Poster Board: 180

ID: 7264
**Resting-State EEG Biomarkers of Accelerated Intermittent Theta Burst Stimulation Treatment for Depression: A Pilot Study**
Ling Guo{1}, Zhuo Zhang{1}, Xiao Wei Tan{2}, Koksoon Phua{1}, Chuanchu Wang{1}, Phern Chern Tor{2}, Kai Keng Ang{1}
{1}Agency for Science, Technology and Research, Singapore; {2}Institute of Mental Health, Singapore
Poster Board: 181

ID: 7607
**Leveraging Motor Unit Spatial Activation Patterns for Channel Selection in Finger Force Regression**
Farah Baracat{4}, Marcello Zanghieri{3}, Luca Benini{1}, Dario Farina{2}, Giacomo Indiveri{4}, Simone Benatti{3}, Elisa Donati{4}
{1}ETH Zürich, Switzerland; {2}Imperial College London, United Kingdom; {3}University of Bologna, Italy; {4}University of Zürich, ETH Zürich, Switzerland
Poster Board: 182

ID: 7893
**Gaze Intersection Points Reveal the Onset of Visual Processing During Eye and Head Movement**
Weichen Liu{3}, Cory Stevenson{3}, Chi-Yuan Chang{1}, Steven Thurman{2}, Russell Cohen-Hoffing{2}, Tzyy-Ping Jung{3}, Ying Choon Wu{3}
{1}Harvard University, United States; {2}U.S. Army Combat Capabilities Development Command Army Research Laboratory, United States; {3}University of California, San Diego, United States
Poster Board: 183

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**Wednesday Poster Session - Physical & Physiological Sensing**
3:30:00 PM - 5:00:00 PM
*Room: Veracruz Hall*

ID: 6106
**Development of Shear Force/Vertical Load Estimation Method Using Vibration Measurement for Shoe Compatibility Evaluation**
Kosei Higuchi, Kota Ogikubo, Jun Inoue
Tokyo Denki University, Japan
Poster Board: 184

ID: 6112
**Predicting Grip Aperture Using Forearm Muscle Activation Data**
Nathan Dodd, Eric Espinoza-Wade
California Polytechnic State University, San Luis Obispo, United States
Poster Board: 185
ID: 6229
**Apnea Detection in Newborns Using Abdominal IMU**
Matteo Ricci{2}, Juliana Manrique-Córdoba{1}, Juan David Romero-Ante{1}, José María Vicente-Samper{1}, Francesca Cordella{2}, José María Sabater-Navarro{1}
{1}Miguel Hernandez University of Elche, Spain; {2}Sapienza Università di Roma, Italy
Poster Board: 186

ID: 6236
**Identification of Hunger and Satiety States from EEG Data**
Deepesh Kalahasti{1}, Edward Sazonov{2}, Evie Malaia{2}
{1}International Institute of Information Technology, Bangalore, India; {2}University of Alabama, United States
Poster Board: 187

ID: 6240
**Remote Patient Monitoring System Based on Wireless Wearable Chest Patch**
Faizan Javed{2}, Joanne Flood{3}, Daniela Tellez{1}, Ryan Kirkpatrick{1}
{1}ResMed Inc, United States; {2}ResMed Ltd, Australia; {3}University of New South Wales, ResMed Ltd, Australia
Poster Board: 188

ID: 6285
**Respiratory System Monitoring Based on Low-Frequency Transmission Ultrasound Using Wearable Transducers**
Tong Zhang, Haokang Shi, Rui Guo, Maokun Li, Fan Yang, Shenheng Xu
Tsinghua University, China
Poster Board: 189

ID: 6289
**Predicting Heart Rate Variability from Heart Rate and Step Count for University Student Weekdays**
James Warren{2}, Lin Ni{2}, Ben Fry{2}, Melanie Stowell{2}, Chelsey Gardiner{1}, Robyn Whittaker{2}, Taria Tane{2}, Rosie Dobson{2}
{1}UniServices Ltd, New Zealand; {2}University of Auckland, New Zealand
Poster Board: 190

ID: 6370
**Personal and Contextual Knowledge Driven Robust Multimodal Affect Recognition Using Smartwatches**
Sirat Samyoun{1}, John Stankovic{2}
{1}Cornell Tech - Cornell University, United States; {2}University of Virginia, United States
Poster Board: 191
ID: 6453
**Association Between Electrical Conductivity and Global Impedance Measured by EIT with Muscle Mass Scores in Sarcopenia**
Guilan Chen{2}, Yanan Diao{2}, Yingchi Wang{2}, Junwen Peng{1}, Bo Sun{4}, Gaoqiang Li{3}, Nan Lou{3}, Guanglin Li{2}, Jiafeng Yao{1}, Guoru Zhao{2}
{1}Nanjing University of Aeronautics and Astronautics, China; {2}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, United States; {2}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {3}University of Hong Kong–Shenzhen Hospital, China; {4}Xi’an University of Technology, China
Poster Board: 192

ID: 6473
**Microcavity Based Biosensor for Detection of SARS-CoV-2**
Yi Su, Zhen Cui, Pavlos Savvidis, Guoguang Rong, Mohamad Sawan
Westlake University, China
Poster Board: 193

ID: 6506
**Utilizing Slope Entropy as an Effective Index for Wearable EEG-Based Depth of Anesthesia Monitoring**
Mohammad Shahbakhti{2}, Matin Beiramvand{3}, Somayeh Mohammadi Far{1}, Jordi Solé-Casals{4}, Tarmo Lipping{3}, Piotr Augustyniak{1}
{1}AGH University of Krakow, Poland; {2}Kaunas University of Technology, Lithuania; {3}Tampere University, Finland; {4}University of Vic–Central University of Catalonia, Spain
Poster Board: 194

ID: 6866
**Identifying Optimal Electrodermal Activity Locations in the Torso for Wearable Belt Monitors: Preliminary Results**
Riley McNaboe, Hugo F Posada-Quintero
University of Connecticut, United States
Poster Board: 195

ID: 6874
**Movement Tracking Accuracy of HTC Vive VR System During Upper Body Discrete Motion Tasks**
Janell Joyner{1}, Kimberly Kontson{2}
{1}Food and Drug Administration, University of Maryland, College Park, United States; {2}US Food and Drug Administration, Health and Human Services, United States
Poster Board: 196

ID: 6886
**Histones Classification Based on EGFET Signals**
Jeffrey Barahona{1}, Hayley Richardson{1}, Lina Acosta{1}, Geet Khatri{1}, Francis Miller{2}, Spyridon Pavlidis{1}, Edgar Lobaton{1}
{1}North Carolina State University, United States; {2}Veterans Affairs Tennessee Valley Medical Center, Vanderbilt University Medical Center, United States
Poster Board: 197
Technical Program – Wednesday, July 17th

ID: 6910
**Adaptive PID Control for Chronotropic Efficiency in Cardiac Pacemakers**
Jasmeet Bhatia, Rohil Deolalikar, Cole Wener, Andrew Zeller, Cameron Zeller, Gert Cauwenberghs
*University of California, San Diego, United States*
Poster Board: 198

ID: 7053
**ECG Signal Construction from Heart Sounds via Single Node, Surface Acoustic Sensing**
Kaylee Yaxuan Li, Yasha Iravantchi, Hyunmin Park, Yiming Liu, Alanson Sample
*University of Michigan, United States*
Poster Board: 199

ID: 7123
**Skin Model for Monitoring Atopic Dermatitis Using Interdigitated Capacitive Sensor**
Alexandar Todorov{2}, Krittika Goyal{1}, Russel Torah{2}, Tom Greig{2}, Michael Ardem-Jones{2}, Stephen Beeby{2}
{1}Rochester Institute of Technology, United States; {2}University of Southampton, United Kingdom
Poster Board: 200

ID: 7242
**Can Pulse Arrival Time Be Used for Cuffless Blood Pressure Estimation? A Clinical Study in ICU**
Zongshen Hou{1}, Yukai Huang{3}, Jia Huang{4}, Yaling Lv{2}, Ningbo Zhao{4}, Hongzhou Lu{4}, Caifeng Shan{1}, Wenjin Wang{2}
{1}Shandong University of Science and Technology, China; {2}Southern University of Science and Technology, China; {3}Southern University of Science and Technology, Zhejiang University of Technology, China; {4}Third People's Hospital of Shenzhen, China
Poster Board: 201

ID: 7316
**A Novel Photo-Electro-Mechano Sensing Array for the Visualization and Estimation of Tonoarteriogram**
Zijun Liu{2}, Rushuang Zhou{2}, Zhou Jiang{2}, Ni Zhao{1}, Xinge Yu{2}, Yuanting Zhang{1}
{1}Chinese University of Hong Kong, Hong Kong; {2}City University of Hong Kong, Hong Kong
Poster Board: 202

ID: 7355
**Exploring the Relationship Between Step Count, Step Length and Walked Distance in Mobile-Aided Six-Minute Walk Test**
Sara Caramaschi{1}, Carl Magnus Olsson{1}, Elizabeth Orchard{2}, Dario Salvi{1}
{1}Malmö University, Sweden; {2}Oxford University Hospitals NHS Foundation Trust, United Kingdom
Poster Board: 203

ID: 7366
**Optimizing Magnetic Induction Sensors for Non-Obtrusive Vital Signs Monitoring: Impact of Current Control on Operational Quality**
Mahdi Momeni{1}, Adrian Radomski{1}, Ulkuhan Guler{2}, Daniel Teichmann{1}
{1}University of Southern Denmark, Denmark; {2}Worcester Polytechnic Institute, United States
Poster Board: 204
Technical Program – Wednesday, July 17th

ID: 7393
Real-World Measures of Cardiorespiratory Function Can Stratify Primary Sjogren’s Syndrome Participants with Persistent Fatigue
Chloe Hinchliffe{1}, Bing Zhai{3}, Victoria Macrae{2}, Jade Walton{2}, Wan-Fai Ng{2}, Silvia Del Din{1}
{1}Newcastle University, United Kingdom; {2}NIHR Newcastle Biomedical Research Centre, United Kingdom; {3}Northumbria University, United Kingdom
Poster Board: 205

ID: 7398
Quantitative Analysis of the Gait Variability and Asymmetry Using Inertial Measurement Unit During Dual-Task Gait
Demin Peng{2}, Yongqiang Zhou{1}, Yanan Diao{1}, Guilan Chen{1}, Yingchi Wang{1}, Yunkun Ning{1}, Guanglin Li{1}, Wei Wang{1}, Guoru Zhao{1}
{1}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, United States; {1}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {2}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China
Poster Board: 206

ID: 7423
Unobtrusive In-Car Measurement of Physiological Signals on the Road
Daniel Teichmann{2}, Adrian Radomski{2}, Masaki Arai{1}, Koki Oshima{1}, Naoki Ooneda{1}, Akinori Ueno{1}
{1}Tokyo Denki University, Japan; {2}University of Southern Denmark, Denmark
Poster Board: 207

ID: 7424
Characterization of the Texas Instruments Inc AFE4500 Analog Front End Chip for Wearable Bioimpedance Applications
Nathan Hansen{2}, Raja Reddy{1}, Prabin Yadav{1}, Praveen Aroul{1}, Lijoy Philipose{1}, Benjamin Sanchez{2}
{1}Texas Instruments, United States; {2}University of Utah, United States
Poster Board: 208

ID: 7454
A Portable and Low-Cost Electrochemical Impedance Spectroscopy Platform for the Characterisation of Implantable Electrodes
Vichaya Manatchinapisit, Timothy Constandinou
Imperial College London, United Kingdom
Poster Board: 209

ID: 7527
Machine Learning Approaches for Blood Pressure Classification from Photoplethysmogram: A Comparative Analysis
Mathew Cigi, Raj Kiran V, P. M. Nabeel, Jayaraj Joseph
Indian Institute of Technology Madras, India
Poster Board: 210
ID: 7572
**Probing Glucose-Sensitive Hydrogel Resonators with a Portable Medical Ultrasound Imaging System**
Prattay Deepta Kairy, Simon Binder, Florian Solzbacher, Lars Bjorn Laurentius, Christopher Friedric Reiche
University of Utah, United States
Poster Board: 211

ID: 7574
**EEG Acquisition and Motor Imagery Classification for Robotic Control**
Hamza Amrani{2}, Daniela Micucci{2}, Marco Nalin{1}, Paolo Napoletano{2}, Ilario Rizzi{2}
{1}AB Medica S.p.A., Italy; {2}Università degli Studi di Milano-Bicocca, Italy
Poster Board: 212

ID: 7585
**Human Emotions Analysis and Recognition Using EEG Signals in Response to 360° Videos**
Haseeb Ur Rahman Abbasi{2}, Zeeshan Rashid{2}, Muhammad Majid{2}, Syed Anwar{1}
{1}Children’s National Hospital, United States; {2}University of Engineering and Technology, Taxila, Pakistan
Poster Board: 213

ID: 7634
**Assessing Pulmonary Function in ALS Using Electrical Impedance Tomography**
Ethan Murphy{2}, Allaire Doussan{2}, Sarah Verga{1}, Elijah Stommel{2}, Courtney McIduff{3}, Ryan Halter{2}, Seward Rutkove{3}
{1}Beth Israel Deaconess Medical Center, United States; {2}Dartmouth College, United States; {3}Harvard Medical School, United States
Poster Board: 214

ID: 7842
**Differential Private Federated Transfer Learning for Mental Health Monitoring in Everyday Settings: A Case Study on Stress Detection**
Ziyu Wang, Zhongqi Yang, Iman Azimi, Amir M. Rahmani
University of California, Irvine, United States
Poster Board: 215

ID: 7896
**Optimal Head-Mounted IMU Placement for Heart Rate Detection Using Ballistography**
Saboorah Mohammadian Roshan, Edward J. Park
Simon Fraser University, Canada
Poster Board: 216

ID: 7964
**Microgels-Based In Vivo Biosensor for Continuous Blood Glucose Monitoring**
Zheng Gong{2}, Xiang Chen{2}, Muhammad Ali{3}, Shanaz X. Chen{1}, Yifan Chen{2}
{1}St Paul’s Collegiate School, New Zealand; {2}University of Electronic Science and Technology of China, China; {3}University of Waikato, New Zealand
Poster Board: 217
ID: 7974
**Investigation of Vascular Morphology Prediction Based on High Dimensional Pulse Acquisition System and Finite Element Methods**
Yue He{1}, Fang Wang{2}, Quan Wang{1}, Heng Yang{2}, Ke Sun{2}, Yi Sun{2}, Xikun Zheng{3}, Jingqing Hu{3}, Xinxin Li{2}
{1}Jiangsu University, China; {2}Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China; {3}Xin-Huangpu Joint Innovation Institute of Chinese Medicine, China
Poster Board: 218

ID: 8035
**Comparative Analysis of Photoplethysmogram (PPG) Waveform Characteristics Across Various Body Sites Under Normal and Apneic Conditions**
Joe Rahme, Sahera Saleh, Tamara Al-Sadek, Jason Amatoury, Massoud Khraiche
American University of Beirut, Lebanon
Poster Board: 219

ID: 8060
**Unobtrusive Wearable System for Load Vertical Location Estimation**
Nozhan Ghoreishi, Femi Olugbon, Dain LaRoche, Sajay Arthanat, John LaCourse, Diliang Chen
University of New Hampshire, United States
Poster Board: 220

**Wednesday Poster Session - Physiological Systems Modeling 2**
3:30:00 PM - 5:00:00 PM
*Room: Veracruz Hall*

ID: 6100
**Mean Perfusion Pressure Estimation Using Hemodynamics Ohm's Law Towards Unobtrusive Mean Arterial Pressure Estimation**
Joohyun Seo, Tony Akl
Analog Devices Inc., United States
Poster Board: 221

ID: 6587
**Weighted Errors-in-Variables Modelling for Detection of Cortico-Muscular Couplings**
Zhenghao Guo{1}, Verity McClelland{3}, Wei Dai{2}, Fengyu Cong{1}, Zoran Cvetkovic{3}
{1}Dalian University of Technology, China; {2}Imperial College London, United Kingdom; {3}King's College London, United Kingdom
Poster Board: 222

ID: 6989
**Estimation of Fetal Autonomic Age by Considering Fetal Behavioural States**
Amna Samjeed{1}, Maisam Wahbah{2}, Ahsan Habib Khandoker{1}
{1}Khalifa University, U.A.E.; {2}University of Dubai, U.A.E.
Poster Board: 223
ID: 7081
Expectancy Violation: Climate Change Associations May Reveal Underlying Brain-Evoked Responses of Implicit Attitudes
Federico Calà, Pietro Tarchi, Lorenzo Frassineti, Mustafa Can Gursesli, Andrea Guazzini, Antonio Lanata
Università degli Studi di Firenze, Italy
Poster Board: 224

ID: 7275
Differential Dermal Potential: A New Paradigm for Measuring Cognitive Load
Dibyanshu Jaiswal{2}, Debatri Chatterjee{2}, Ramesh Kumar Ramakrishnan{2}, Arpan Pal{2}, Ratna Ghosh{1}
{1}Jadavpur University, India; {2}Tata Consultancy Services Limited, India
Poster Board: 225

ID: 7478
Personality Trait Recognition Using ECG Spectrograms and Deep Learning
Muhammad Altaf{2}, Saadat Khan{2}, Muhammad Majid{2}, Syed Anwar{1}
{1}Children’s National Hospital, United States; {2}University of Engineering and Technology, Taxila, Pakistan
Poster Board: 226

ID: 7849
Pressure and Temperature Modulation in a Hot Isostatic Pressure Chamber
Joshua Tesoro, Pouya Rassouli, Allen Earley, Zaineb Ashraf, Noor Jameel
University of California, San Diego, United States
Poster Board: 227

ID: 7867
Photobleaching Step Counting and Localization for Fluorescence Microscopy
Charles Truong{1}, Thomas Bugea{3}, Baptiste Bouhet{2}, Guillaume Tresset{2}, François Marquier{3}, Karen Perronet{3}
{1}Université Paris Saclay, Université Paris Cité, ENS Paris-Saclay, CNRS, SSA, INSERM, Centre Borelli, France; {2}Université Paris-Saclay, CNRS, Laboratoire de Physique des Solides, France; {3}Université Paris-Saclay, ENS Paris-Saclay, CNRS, CentraleSupelec, LuMIn, France
Poster Board: 228

ID: 7882
Data-Driven Peak Alpha Identification Reveals Distinct EEG Spatial Signature Phenotypes in Chronic Pain
Sandya Subramanian, Edward Lannon, Sean Mackey
Stanford University, United States
Poster Board: 229
Wednesday Poster Session - Rehabilitation Robotics

ID: 6028
**Perturbation-Induced Electromyographic Activity Is Predictive of Flexion Synergy Expression and a Sensitive Measure of Post-Stroke Motor Impairment**
Nirvik Sinha{1}, Julius Dewald{1}, Yuan Yang{2}
{1}Northwestern University, United States; {2}University of Illinois Urbana-Champaign, United States
Poster Board: 230

ID: 6096
**Integrating Therapy Into Play: Stand-On Ride-On for a Child with Cerebral Palsy**
Kira Flanagan, Crystal Diaz, Guilherme Cesar, Juan Aceros
University of North Florida, United States
Poster Board: 231

ID: 6414
**Multidimensional Feature Analysis Shows Stratification in Robotic-Motor-Training Gains Based on the Level of Pre-Training Motor Impairment in Stroke**
Sebastian Rueda Parra{1}, Joel Perry{3}, Eric Wolbrecht{3}, David Reinkensmeyer{2}, Disha Gupta{1}
{1}National Center for Adaptive Neurotechnologies, United States; {2}University of California, Irvine, United States; {3}University of Idaho, United States
Poster Board: 232

ID: 6504
**GaitObserver: Robotic Solution Unveiling Human Walking Dynamics in Motor-Cognitive Dual Tasks**
Alessandra Sorrentino{2}, Gianmaria Mancioppi{2}, Robert Riener{1}, Erika Rovini{2}, Laura Fiorini{2}, Filippo Cavallo{2}
{1}ETH Zürich, Switzerland; {2}Università degli Studi di Firenze, Italy
Poster Board: 233

ID: 6567
**A Preliminary Characterization of Physical Therapist Visual Behaviors During Standing Balance Tasks Using Eye Tracking**
Emma Nigrelli, Leia Stirling, Kathleen Sienko
University of Michigan, United States
Poster Board: 234

ID: 7196
**Mathematical Modeling and Characterization of a Wearable Soft Robotic Device for Muscle Mechanotherapy**
Victor Ticllacuri{1}, Renato Mio{2}
{1}Pontificia Universidad Católica del Perú, Peru; {2}University of Bayreuth, Germany
Poster Board: 235
Technical Program – Wednesday, July 17th

ID: 7200
Computational Analysis of Mechanical Interactions Between a Soft Robotic Device and a Skin-Muscle Phantom for Mechanotherapy
Victor Ticllacuri{1}, Renato Mio{2}
{1}Pontificia Universidad Católica del Perú, Peru; {2}University of Bayreuth, Germany
Poster Board: 236

ID: 7304
Effect of Anthropometry on Plantar Pressure Distribution During Gait in Overweight Male Subjects
Abdelsalam Alkhalaileh, Muhammed Abdullah, Abdul Aziz Hulleck, Kinda Khalaf, Herbert Franz Jelinek, Marwan El Rich
Khalifa University, U.A.E.
Poster Board: 237

ID: 7305
Estimating Upper-Extremity Function with Raw Kinematic Trajectory Data After Stroke Using End-to-End Machine Learning Approach
Wanyi Qing, Changjie Pan, Jianing Zhang, Chun-Yan Chau, Chun-Hin Mui, Xiaoling Hu
Hong Kong Polytechnic University, Hong Kong
Poster Board: 238

ID: 7390
Advanced Wheelchair Rehabilitation: Surface EMG-Augmented 9-DoF System for Upper and Lower Limb
Jagan P, Sasirekha Gvk, Madhav Rao, Jyotsna Bapat, Debabrata Das
International Institute of Information Technology Bangalore, India
Poster Board: 239

ID: 7647
Effects of Wearing an Upper Extremity Exoskeleton on Measuring Joint Kinematics During Standardized Clinical Assessment Tasks
Yoon No Gregory Hong{1}, Kyoungsoon Kim{1}, Ashish Deshpande{2}, Jinsook Roh{1}
{1}University of Houston, United States; {2}University of Texas at Austin, United States
Poster Board: 240

ID: 7927
Head Shaking Test and its Validity Considering from the Point of View of Muscle Activities
Emiko Uchiyama{5}, Wataru Takano{4}, Yoshihiko Nakamura{1}, Takahiro Miura{2}, Shujiro Imaeda{3}, Toshiaki Tanaka{5}
{1}Kinescopic, Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan; {3}NIKKEN Sekkei Research Institute, Japan; {4}Osaka University, Japan; {5}University of Tokyo, Japan
Poster Board: 241
Wednesday Poster Session - Sensors & Applications
3:30:00 PM - 5:00:00 PM
Room: Veracruz Hall

ID: 6022
High-Resolution Time-Frequency Analysis of EEG Signals for Affective Computing
Yedukondala Rao Veeranki, Hugo F Posada-Quintero
University of Connecticut, United States
Poster Board: 242

ID: 6049
A CNN and Transformer Hybrid Network for Multi-Class Arrhythmia Detection from Photoplethysmography
Zengding Liu{3}, Bin Zhou{1}, Jikui Liu{4}, Honglei Zhao{1}, Ye Li{3}, Fen Miao{2}
{1}Fuwai Hospital Chinese Academy of Medical Sciences, China; {2}Shenzhen Institute for Advanced Study, University of Electronic Science and Technology of China, China; {3}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {4}Shenzhen Polytechnic University, Shenzhen, China
Poster Board: 243

ID: 6197
Wearable-Oriented Support for Interpretation of Behavioural Effects on Sleep
Clauirton Siebra{1}, Jonysberg Quintino{2}, Andre L.M. Santos{3}, Fabio Q. B. Da Silva{3}
{1}Federal University of Paraiba, Brazil; {2}SABIA, Federal University of Pernambuco, Brazil; {3}Universidade Federal de Pernambuco, Brazil
Poster Board: 244

ID: 6547
MedDietAgent: An AI-Based Mobile App for Harmonizing Individuals’ Dietary Choices with the Mediterranean Diet Pattern
Fotios S. Konstantakopoulos{3}, Michail Sfakianos{1}, Eleni I. Georga{3}, Konstantinos I. Mavrokoitas{3}, Daphne N. Katsarou{3}, Konstantinos Chalatsis{1}, Charalambos Zapadiotis{1}, Anastasia Panousi{2}, Sifis Plimakis{2}, Sofia Eleftheriou{5}, Anastasia
{1}AppArt, Greece; {2}DBC diadikasia, Greece; {3}University of Ioannina, Greece; {4}University of Ioannina, FORTH-BRI, Greece; {5}University of West Attica, Greece
Poster Board: 245

ID: 6552
Can Heart Rate Variability Demonstrate Progression of Mindfulness Through Two-Week Repeated Practice?
Yifei Xu, Yanping Wei, Wanlin Chen, Xuanyi Wang, Jing Zheng, Shulin Chen, Hang Chen
Zhejiang University, China
Poster Board: 246
ID: 6658
REM Estimation Based on Accelerometer by Excluding Other Stages and Two-Scale Smoothing
Daiki Shintani{2}, Iko Nakari{2}, Satomi Washizaki{1}, Keiki Takadama{2}
{1}Brain Sleep Co. LTD., Japan; {2}University of Electro-Communications, Japan
Poster Board: 247

ID: 6820
The Estimation of Sagittal Plane Shoulder Flexion/Extension Posture Endurance Time and Repetition Endurance Time on Drilling Tasks from Surface Electromyography (sEMG) Signals
Jeong-Bae Ko, Kyeong-Hee Choi, Jae-Soo Hong
Korea Institute of Industrial Technology, Korea
Poster Board: 248

ID: 7043
Does Baseline Stress Affect Electrodermal Activity? a Serious-Game-Based Pilot Study
Giulia Masi{2}, Gianluca Amprimo{2}, Irene Rechichi{2}, Claudia Ferraris{1}, Gabriella Olmo{2}
{1}Consiglio Nazionale Delle Ricerche IEIIT, Italy; {2}Politecnico di Torino, Italy
Poster Board: 249

ID: 6215
A Novel Algorithm for Real-Time Detection of Freezing of Gait Using Wrist-Based Accelerometer Sensor Data
Nasimuddin Ahmed, Aniruddha Sinha, Avik Ghose
Tata Consultancy Services Limited, India
Poster Board: 250

ID: 6237
Simulating Accelerometer Signals of Parkinson’s Gait Using Generative Adversarial Networks
Aaron Hadley{2}, Christopher Pulliam{1}
{1}Case Western Reserve University, United States; {2}Hadley Research, United States
Poster Board: 251

ID: 7258
Illumination-Robust Camera-PPG via Skin-Guided Auto-Exposure
Shuhan Yi, Dongfang Yu, Yingen Zhu, Wenjin Wang
Southern University of Science and Technology, China
Poster Board: 252

ID: 8085
Classifying Driver Distraction with Textile Electrocardiograms
Kaveti Pavan{1}, Vishal Singh Roha{3}, Tomohiko Igasaki{2}, P.A. Karthick{4}, Digvijay S. Pawar{1}, Nagarajan Ganapathy{1}
{1}Indian Institute of Technology Hyderabad, India; {2}Kumamoto University, Japan; {3}Monash University, Australia; {4}National Institute of Technology Tiruchirappalli, India
Poster Board: 253
Technical Program – Wednesday, July 17th

ID: 6053
**Open-RDS: An Open-Source Mobile Application for Facilitating Respondent-Driven Sampling Surveys**
Zachary Sappington, Cameron Woodard, Morgan Jackson, Kevin Belobrajdic, John Matta
Southern Illinois University Edwardsville, United States
Poster Board: 254

ID: 6171
**Analyzing Emotional Dynamics: Transition Network Insights from Electrodermal Activity**
Yedukondala Rao Veeranki{2}, Ramakrishnan Swaminathan{1}, Hugo F Posada-Quintero{2}
{1}Indian Institute of Technology Madras, India; {2}University of Connecticut, United States
Poster Board: 255

ID: 6696
**Epileptic State Prediction Using Phase Space Domain and Machine Learning Algorithms**
Boluwatife Faremi, Yedukondala Rao Veeranki, Hugo F Posada-Quintero
University of Connecticut, United States
Poster Board: 256

ID: 7782
**Public Healthcare Informatics for COVID-19 from Social Media Data**
Vishwa Kumar{2}, Avimanyu Sahoo{2}, Ritika Kumar{1}, Nicholas Loyd{2}
{1}North Alabama Medical Center, United States; {2}University of Alabama in Huntsville, United States
Poster Board: 257

ID: 6726
**A Tracking and Monitoring System for Transplanted Organs During the Transport Phase**
Patricia Sánchez-González{2}, Diego Moreno Blanco{2}, Sandra Pérez Jiménez{2}, Francisco Javier Rubio{1}, Pablo Stringa{1}, Francisco Hernández{1}, Manuel Quintana{1}, Enrique Javier Gómez{2}
{1}Hospital Universitario de La Paz, Spain; {2}Universidad Politécnica de Madrid, Spain
Poster Board: 258

ID: 7727
**Evaluating Smoothness of Force for Surgical Skill Assessment**
Simar Singh, Amir Mehdi Shayan, Jianxin Gao, Joe Bible, Richard Groff, Ravikiran Singapogu
Clemson University, United States
Poster Board: 259

**Wednesday Poster Session - Sensors & Devices**
3:30:00 PM - 5:00:00 PM
Room: Veracruz Hall

ID: 6331
**Heart Rate Estimation from Neck Photoplethysmography Using FFT-Based Scoring and a Shallow Neural Network**
Rawan Abdulsadig, Esther Rodriguez-Villegas
Imperial College London, United Kingdom
Poster Board: 260
Technical Program – Wednesday, July 17th

ID: 7146
**Development and Preliminary Evaluation of a Short-Term Direct Left Ventricular Puncture Type Compact Percutaneous Blood Pump**
Francis Chikweto\(^2\), Yasuyuki Shiraishi\(^2\), Hanako Suzuki\(^2\), Aoi Fukaya\(^2\), Tashihiko Kijima\(^1\), Kazushi Ishiyama\(^2\), Tomoyuki Yambe\(^2\)
\(^1\)C&T Medical Lab., Japan; \(^2\)Tohoku University, Japan
Poster Board: 261

ID: 7323
**Jugular Venous Pulse Waveform Acquisition Using Contact Piezo Sensor: A Pilot Study**
Navya Rose George, Nimmi Sudarsan, Rahul Manoj, Raj Kiran V, P. M. Nabeel, Mohanasankar Sivaprasam, Jayaraj Joseph
Indian Institute of Technology Madras, India
Poster Board: 262

ID: 7628
**Remote Breathing Monitoring Using LiDAR Technology**
Omar Rinchi, Ahmad Alsharoa, Denise Baker
Missouri University of Science and Technology, United States
Poster Board: 263

ID: 7749
**Use of Optical Mapping to Assess the Level of Maturation of Engineered Heart Tissues**
Sanaz Hosseini, Xiangzhen Kong, Sophie E. Givens, Brenda M. Ogle, Elena G. Tolkacheva
University of Minnesota Twin Cities, United States
Poster Board: 264

**Wednesday Poster Session - Signal Pattern Classification**
3:30:00 PM - 5:00:00 PM
*Room: Veracruz Hall*

ID: 6018
**ADHD Diagnosis Through Resting-State EEG Frequency Analysis with Random Forest**
Guilherme Pedrollo\(^3\), Leia Bernardi Bagesteiro\(^2\), Alexandre R. Franco\(^1\), Alexandre Balbinot\(^3\)
\(^1\)Nathan Kline Institute, Child Mind Institute, New York University, United States; \(^2\)San Francisco State University, United States; \(^3\)Universidade Federal do Rio Grande do Sul, Brazil
Poster Board: 265

ID: 6031
**Event-Related Potentials and Event-Related Spectral Perturbation for Classification of Apolipoprotein E ε4 Allele Carriers in Alzheimer Disease Patients and Healthy Controls**
Kauê O. Frassão\(^1\), Sandro M. S. Filho\(^1\), Renata Valle Pedros\(^2\), Carla Manuela Crispim Nascimento\(^2\), Henrique Pott-Junior\(^2\), Marcia Regina Cominetti\(^2\), Francisco J. Fraga\(^1\)
\(^1\)Federal University of ABC, Brazil; \(^2\)Federal University of São Carlos, Brazil
Poster Board: 266
ID: 6140
**Regression of Multiple Conversation Aspects Using Dyadic Physiological Measurements**
Iman Chatterjee{1}, Maja Goršič{2}, Robert Kaya{3}, Collyn Erion{3}, Joshua Clapp{3}, Vesna Novak{1}
{1}University of Cincinnati, United States; {2}University of Wisconsin-Milwaukee, United States; {3}University of Wyoming, United States
Poster Board: 267

ID: 6199
**Temporal Convolutional Network for Gait Event Detection**
Hassan Ashraf{2}, Cédric Schwartz{2}, Asim Waris{1}, Olivier Brüls{2}, Mohamed Boutaayamou{2}
{1}National University of Sciences and Technology, Pakistan; {2}University of Liège, Belgium
Poster Board: 268

ID: 6213
**Time Window Optimization for Riemannian Geometry-Based Motor Imagery EEG Classification**
Fanbo Zhuo, Bo Lv, Fengzhen Tang
Shenyang Institute of Automation, China
Poster Board: 269

ID: 6361
**Improving Bioimpedance-Based Tissue Identification with Frequency Response Similarity Metrics**
Jacob Search, Sabino Zani, Brian P. Mann
Duke University, United States
Poster Board: 270

ID: 6441
**Adventitious Pulmonary Sound Detection: Leveraging SHAP Explanations and Gradient Boosting Insights**
Shiva Shokouhmand, Md Motiur Rahman, Miad Faezipour, Smriti Bhatt
Purdue University, United States
Poster Board: 271

ID: 6457
**Real-Time Detection of Motifs from Semi-Synthetic Calcium Imaging Data with Various Noise Types**
Zhucheng He, Pablo Vergara, Masanori Sakaguchi, Taro Tezuka
University of Tsukuba, Japan
Poster Board: 272

ID: 6459
**Improving EEG-Based Cross-Subject Mental Workload Classification Performance with Euclidean-Aligned Periodic and Aperiodic Features**
Tao Wang, Yufeng Ke, Feng He, Dong Ming
Tianjin University, China; Tianjin University, United States
Poster Board: 273
Technical Program – Wednesday, July 17th

ID: 6507
**HRV-Based Monitoring of Neonatal Seizures with Machine Learning**
Hui Lu{1}, Stefan Kusnik{2}, Dilbar Mammadova{2}, Regina Trollmann{2}, Alexander Koelpin{3}
{1}Brandenburgische Technische Universität Cottbus–Senftenberg, Germany; {2}Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; {3}Technische Universität Hamburg, Germany
Poster Board: 274

ID: 6525
**Cough Classification of Unknown Emerging Respiratory Disease with Federated Learning**
Mesut Ceylan{4}, Frank Rassouli{1}, Maximilian Boesch{1}, Martin Brutsche{1}, Elgar Fleisch{3}, Filipe Barata{2}
{1}Cantonal Hospital St. Gallen, Switzerland; {2}ETH Zürich, Switzerland; {3}ETH Zürich & University of St. Gallen, Switzerland; {4}University of Zürich, Switzerland
Poster Board: 275

ID: 6673
**Discrimination of Real and Deep Fake Videos Using EEG Signals**
Muhammad Riyyan Khan{1}, Hasan Mir{1}, Fares Al-Shargie{1}, Usman Tariq{1}, Abhinav Dhall{2}, Shahzeb Naeem{1}, Malik Nasir Afzal Khan{1}, Hasan Al-Nashash{1}
{1}American University of Sharjah, U.A.E.; {2}Flinders University, U.A.E.
Poster Board: 276

ID: 6680
**Prediction of Postinduction Hypotension by Machine Learning**
Shuoyan Zhao{1}, Alan Hamo{1}, Niki Ottenhof{2}, Jan-Wiebe Korstanje{2}, Justin Dauwels{1}
{1}Delft University of Technology, Netherlands; {2}Erasmus University Medical Center, Netherlands
Poster Board: 277

ID: 6728
**The Seizure Detection Based on a Novel Electroencephalogram Segmentation**
Mingxia Shi{3}, Guang Yang{2}, Wen Wang{4}, Yueyang Hu{1}, Lin Wan{4}, Qingya Li{3}, Xiaoyan Tao{3}
{1}Beijing Forestry University, China; {2}First Medical Center & Seventh Medical Center of PLA General Hospital, Southern Medical University, China; {3}Institute of Automation, Chinese Academy of Sciences, China; {4}Seventh Medical Center of Chinese PLA General Hospital, China
Poster Board: 278

ID: 6783
**Detection of High-Frequency Oscillations from Intracranial EEG Data with Switching State Space Model**
Zeyu Gu{2}, Shihao Yang{1}, Zhongyuan Yu{1}, Feng Liu{1}
{1}Stevens Institute of Technology, United States; {2}Xi’an Jiaotong-Liverpool University, China
Poster Board: 279

ID: 6949
**Two-Factor Biometric Verification with ECG: Two Cancelable Approaches**
Jui-Kun Chiu, Tzu-Yun Lin, Wei-Shen Hsu, Shun-Chi Wu
National Tsing Hua University, Taiwan
Poster Board: 279
ID: 7017  
**Dementia Detection by In-Text Pause Encoding**  
Reza Soleimani{1}, Shengjie Guo{1}, Katarina Haley{2}, Adam Jacks{2}, Edgar Lobaton{1}  
{1}North Carolina State University, United States; {2}University of North Carolina at Chapel Hill, United States  
Poster Board: 281

ID: 7044  
**Detection of Sleep Oxygen Desaturations from Electroencephalogram Signals**  
Shashank Manjunath, Aarti Sathyanarayana  
Northeastern University, United States  
Poster Board: 282

ID: 7094  
**Physical, Social and Cognitive Stressor Identification Using Electrocardiography-Derived Features and Machine Learning from a Wearable Device**  
Maxine He{2}, Jonathan Cerna{2}, Abdul Alkurdi{2}, Ayse Dogan{2}, Jennifer Zhao{2}, Jean Clore{1}, Richard Sowers{2}, Elizabeth Hsiao-Wecksler{2}, Manuel Hernandez{2}  
{1}University of Illinois Chicago, United States; {2}University of Illinois Urbana-Champaign, United States  
Poster Board: 283

ID: 7207  
**Interpretable Automated Arrhythmia Detection: An Assistive Framework for Clinicians**  
Dhaladhuli Jahnavi, Ashutosh Dash, Mrinal Acharya, Nirmalya Ghosh, Amit Patra  
Indian Institute of Technology Kharagpur, India  
Poster Board: 284

ID: 7232  
**A Multi-Task Model for Infant Crying Detection and Reasoning**  
Ming Xia, Dongmin Huang, Wenjin Wang  
Southern University of Science and Technology, China  
Poster Board: 285

ID: 7235  
**Seizure Onset Zone Classification of Intracranial EEG Signals from Epilepsy Patients**  
Mostafa Mohammadpour{4}, Christoph Kapeller{1}, Milena Korostenskaja{3}, Leonhard Schreiner{2}, Josef Scharinger{4}, Christoph Guger{1}  
{1}g.tec medical engineering GmbH, Austria; {2}g.tec medical engineering GmbH, Johannes Kepler University Linz, Austria; {3}g.tec neurotechnology USA, Inc., United States; {4}Johannes Kepler University, Austria  
Poster Board: 286
ID: 7240
Estimation of the Stages of Labor Using a Multichannel Electrohysterogram Sensor and Conditional Variational Autoencoder
Minon Kushihashi{1}, Shintaro Izumi{1}, Hirokazu Iida{3}, Shusuke Yoshimoto{3}, Tsuyoshi Takiuchi{3}, Kazuya Mimura{3}, Takeshi Kanagawa{4}, Aiko Kakigano{2}, Tsuyoshi Sekitani{3}, Masayuki Endoh{3}, Tadashi Kimura{3}, Hiroshi Kawaguchi{1}
{1}Kobe University, Japan; {2}National Cerebral and Cardiovascular Center, Japan; {3}Osaka University, Japan; {4}Osaka Women's and Children's Hospital, Japan
Poster Board: 287

ID: 7266
Development of a Motion Estimation Method Using a Piezoelectric Wire Sensor
Yuhi Asanuma, Yuki Hamada, Jun Inoue
Tokyo Denki University, Japan
Poster Board: 288

ID: 7290
Schizophrenia Detection Using Entropy Difference-Based Electroencephalogram Channel Selection Approach
Telagam Setti Sunil Kumar{2}, Shishir Maheshwari{1}, Kandala N V P S Rajesh{3}
{1}Thapar Institute of Engineering & Technology, India; {2}University of Gävle, Sweden; {3}Vellore Institute of Technology, Andhra Pradesh, Sweden
Poster Board: 289

ID: 7293
LightIED: Explainable AI with Light CNN for Interictal Epileptiform Discharge Detection
Ibuki Inoue{3}, Xuyang Zhao{3}, Shuji Komeiji{3}, Noboru Yoshida{1}, Hidenori Sugano{2}, Madoka Nakajima{2}, Toshihisa Tanaka{3}
{1}Juntendo University Nerima Hospital, Japan; {2}Juntendo University School of Medicine, Japan; {3}Tokyo University of Agriculture and Technology, Japan
Poster Board: 290

ID: 7297
Evaluation of FES-Induced Muscle Fatigue and Recovery Using Torque and Surface Electromyography
Chenglin Lyu{1}, Georgios Panteli{3}, L.Cornelius Bollheimer{2}, Steffen Leonhardt{3}, Philip von Platen{3}
{1}RWTH Aachen University, Germany; {2}RWTH Aachen University Hospital, Germany; {3}RWTH Aachen University, Helmholtz-Institute for Biomedical Engineering, Germany
Poster Board: 291

ID: 7326
Detection of Hypoglycemia Using Ear-EEG
Alvaro Fuentes Cabrera{3}, Eva Gram-Kampmann{2}, Simon Lind Kappel{1}, Line Sofie Remvig{4}, Hans Olaf Toft{3}, Rasmus Elsborg Madsen{3}, Claus Juhl{5}, Preben Kidmose{1}, Mike Lind Rank{3}
{1}Aarhus University, Denmark; {2}Odense University Hospital, Denmark; {3}T&W Engineering A/S, Denmark; {4}UNEEG Medical A/S, Denmark; {5}University Hospital, Denmark
Poster Board: 292
ID: 7336
Assessing the Effectiveness of Heart Rate Variability as a Diagnostic Tool for Brain Injuries in Infants
Kimia Rezaei, Kaiyu Yu, Sean Mathieson, Andrew Flynn, Gordon Lightbody, Geraldine Boylan, William Mamane
University College Cork, Ireland
Poster Board: 293

ID: 7343
Arterial Pulse Wave Analysis Can Detect Vascular Alterations in Response to Therapy in Septic Shock
Marta Carrara, Diletta Guberti, Manuela Ferrario
Politecnico di Milano, Italy
Poster Board: 294

ID: 7356
Impact of Activity Pace and Arm Position on Classification of ADLs
Sayee Sreenivas G B., Anish Chand Turlapaty, Surya Naidu, Vidya Sagar
Indian Institute of Information Technology Sri City, Chittoor, India
Poster Board: 295

ID: 7404
Network Analysis of Meditative States in Highly Skilled Meditators Using EEG and Horizontal Visibility Graphs
Tamas Madl
Austrian Research Institute for Artificial Intelligence, Austria
Poster Board: 296

ID: 7480
Detecting Deepfakes with Super-Resolution EEG
Ramzi Al-Sharawi{1}, Hamza Athar{1}, Muhammad Riyyan Khan{1}, Usman Tariq{1}, Fares Al-Shargie{1}, Abhinav Dhall{2}, Hasan Al-Nashash{1}
{1}American University of Sharjah, U.A.E.; {2}Flinders University, Australia
Poster Board: 297

ID: 7488
An Efficient Deep Transfer Learning Network for Characterization of Stroke Patients' Motor Execution from Multi-Channel EEG-Recordings
Oluwarotimi Williams Samuel{2}, Mojisola Asogbon{2}, Frank Kulwa{1}, Alistair McEwan{2}, Sunday Timothy Aboyeji{1}, Rami Khushaba{3}, Peng Fang{1}, Guanglin Li{1}
{1}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {2}University of Derby, United Kingdom; {3}University of Sydney, Transport for NSW, Australia
Poster Board: 298
Technical Program – Wednesday, July 17th

ID: 7581
A Random Forest Model for Pulseless Electrical Activity Prognosis Prediction During Out-of-Hospital Cardiac Arrest Using Invasive Blood Pressure
Jon Urteaga{2}, Andoni Elola{2}, Per Olav Berve{1}, Lars Wik{1}, Elisabete Aramendi{2}
{1}Oslo University Hospital, Norway; {2}University of the Basque Country, Spain
Poster Board: 299

ID: 7685
An Adaptive Algorithm for Detection of Arterial Blood Pressure Pulses
Mohammadreza Kazemi{1}, Taylor Baum{2}, Emery Brown{2}
{1}Florida International University, United States; {2}Massachusetts Institute of Technology, United States
Poster Board: 300

ID: 7747
Evaluation of Cough Sound Segmentation Algorithms in the Presence of Background Noise
Roneel Sharan{2}, Hao Xiong{1}
{1}Macquarie University, Australia; {2}University of Essex, United Kingdom
Poster Board: 301

ID: 7761
Evaluating Atypical Gaze Patterns Through Vision Models: The Case of Cortical Visual Impairment
Kleanthis Avramidis, Melinda Y. Chang, Rahul Sharma, Mark S. Borchert, Shrikanth Narayanan
University of Southern California, United States
Poster Board: 302

ID: 7871
EEG-Estimated Functional Connectivity, and Not Behavior, Differentiates Parkinson’s Patients from Health Controls During the Simon Conflict Task
Xiaoxiao Sun, Chongkun Zhao, Sharath Koorathota, Paul Sajda
Columbia University, United States
Poster Board: 303

ID: 7918
Automated Abnormality Detection in Patient Retinal Function: A Deep Learning-Powered Electroretinogram Analysis System
Binh Duong Giap{2}, Keely Likosky{2}, Karthik Srinivasan{1}, Naheed Khan{2}, Nambi Nallasamy{2}
{1}Aravind Eye Hospital, India; {2}University of Michigan, United States
Poster Board: 304

ID: 7978
Robust Anomaly Detection of Adventitious Auscultation Signals Using Bayesian Belief Tracking
Annapurna Kala, Mounya Elhilali
Johns Hopkins University, United States
Poster Board: 305
ID: 8005
**Plantar Pressure Based Personality Type Classification Using Gait Cycle Features**  
Ahyun Jung, Jihee Choe, Suyeon Jo, Seungmin Jeong, Young Kim, Se Dong Min  
Soonchunhyang University, Korea  
Poster Board: 306

ID: 8013
**BioPoint: Enhancing Human-Computer Interaction Through Single-Site, Multi-Sensor Gesture Recognition**  
Xavier Isabel{1}, Evan Campbell{2}, Loïc Olivier{1}, Gabriel Gagné{1}, Erik Scheme{2}, Ulysse Côté-Allard{3}, Gabriel Gagnon-Turcotte{1}  
{1}Université Laval, Canada; {2}University of New Brunswick, Canada; {3}University of Oslo, Norway  
Poster Board: 307

ID: 8047
**Reflectance Outperforms Force and Position in Model-Free Needle Puncture Detection**  
Rachael L’Orsa{1}, Anupam Bisht{2}, Linhui Yu{2}, Kartikeya Murari{2}, David T. Westwick{2}, Garnette R. Sutherland{2}, Katherine J. Kuchenbecker{1}  
{1}Max Planck Institute for Intelligent Systems, Germany; {2}University of Calgary, Canada  
Poster Board: 308

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**Wednesday Poster Session - Signal Processing Using Machine/Deep Learning**  
3:30:00 PM - 5:00:00 PM  
Room: Veracruz Hall

ID: 6102
**Derm-T2IM: Harnessing Synthetic Skin Lesion Data via Stable Diffusion Models for Enhanced Skin Disease Classification Using ViT and CNN**  
Muhammad Ali Farooq{2}, Wang Yao{2}, Michael Schukat{2}, Mark A Little{1}, Peter Corcoran{2}  
{1}Trinity College Dublin, Ireland; {2}University of Galway, Ireland  
Poster Board: 309

ID: 6138
**Pupil-Linked Arousal Is Predictive of Team Performance in a Virtual Reality (VR) Sensory-Motor Task**  
Yinuo Qin, Weijia Zhang, Richard Lee, Xiaoxiao Sun, Paul Sajda  
Columbia University, United States  
Poster Board: 310

ID: 6167
**RTA-Former: Reverse Transformer Attention for Polyp Segmentation**  
Zhikai Li, Murong Yi, Ali Uneri, Sihan Niu, Craig Jones  
Johns Hopkins University, United States  
Poster Board: 311
ID: 6222
**Predicting Hemodynamic and Pulmonary Decompensation with Deep Neural Networks: Performance and Explainability**
Johannes Rust{1}, Christian Mandel{1}, Kathrin Stich{2}, Serge Autexier{1}
{1}German Research Center for Artificial Intelligence, Germany; {2}Gesundheit Nord gGmbH, Germany
Poster Board: 312

ID: 6243
**Hybrid Model Design for Protein Function Prediction**
Shenghao Zhao{4}, Xiaoyu Zhang{4}, Ziyuan Zhao{1}, Peisheng Qian{1}, Weide Liu{3}, Zeng Zeng{5}, Bharadwaj Veeravalli{8}, Lingyun Dai{6}, Pär Nordlund{7}, Nayana Prabhu{1}, Wai Leong Tam{2}, Xulei Yang{1}
{1}Agency for Science, Technology and Research, Singapore; {2}Genome Institute of Singapore, Agency for Science, Technology and Research, Singapore; {3}Harvard Medical School, United States; {4}I2R, Agency for Science, Technology and Research, National University of Singapore, Singapore; {5}I2R, Agency for Science, Technology and Research, Shanghai University, Singapore; {6}IMCB, Agency for Science, Technology and Research, Singapore; {7}Karolinska Institute, Sweden; {8}National University of Singapore, Singapore
Poster Board: 313

ID: 6293
**A Multi-Modal Approach for Identifying Schizophrenia Using Cross-Modal Attention**
Gowtham Premananth, Yashish M. Siriwardena, Philip Resnik, Carol Espy-Wilson
University of Maryland, College Park, United States
Poster Board: 314

ID: 6294
**Profiling Patient Transcript Using Large Language Model Reasoning Augmentation for Alzheimer’s Disease Detection**
Chin-Po Chen, Jeng-Lin Li
Inventec Corporation, Taiwan
Poster Board: 315

ID: 6362
**Data Quality Matters: Suicide Intention Detection on Social Media Posts Using RoBERTa-CNN**
Emily Lin, Jian Sun, Hsingyu Chen, Mohammad H. Mahoor
University of Denver, United States
Poster Board: 316

ID: 6378
**EmoNet: Deep Learning-Based Emotion Climate Recognition Using Peers’ Conversational Speech, Affect Dynamics, and Physiological Data**
Ghada Alhussein, Mohanad Alkhodari, Shiza Saleem, Efstratia Roumeliotou, Leontios Hadjileontiadis Khalifa University, U.A.E.
Poster Board: 317
ID: 6383
Research on Tone Enhancement of Mandarin Pitch Controllable Electrolaryngeal Speech Based on Deep Learning
Jie Zhou{1}, Li Wang{1}, Fengji Li{1}, Shaochuang Zhang{1}, Tao Liu{1}, Xiaohong Chen{2}, Haijun Niu{1}
{1}Beihang University, China; {2}Beijing Tongren Hospital, Capital Medical University, China
Poster Board: 318

ID: 6446
RepAugment: Input-Agnostic Representation-Level Augmentation for Respiratory Sound Classification
June-Woo Kim{3}, Miika Toikkanen{4}, Sangmin Bae{2}, Minseok Kim{1}, Ho-Young Jung{3}
{1}Amazon, United States; {2}Korea Advanced Institute of Science and Technology, Korea; {3}Kyungpook National University, Korea; {4}RSC LAB, MODULABS, Korea
Poster Board: 319

ID: 6691
An Improved Approach for Semantic Segmentation of Fundus Lesions Using R2U-Net
Alejandro Pereira{3}, Carlos Santos{1}, Marilton Aguiar{3}, Daniel Welfer{6}, Marcelo Dias{3}, Rafaela de Menezes{1}, Paulo Roberto Ferreira{3}, Fábio Rossi{1}, Marcos d’Ornellas{6}, Carlos Jesus Haygert{6}, Juliano Kazienko{6}, Fábio Comim{2}, Aurélio Ho
{1}Federal Institute of Education, Science and Technology Farroupilha, Brazil; {2}Federal University of Minas Gerais, Brazil; {3}Federal University of Pelotas, Brazil; {4}Federal University of Rio Grande, Brazil; {5}Federal University of Rio Grande do Sul, Brazil; {6}Federal University of Santa Maria, Brazil; {7}University of Blumenau, Brazil
Poster Board: 320

ID: 6804
Epileptic Seizure Classification with Patient-Level and Video-Level Contrastive Pretraining
Chin-Jou Li{3}, Chien-Chen Chou{4}, Yen Cheng Shih{4}, Li-Chuan Kuo{3}, Yu-Te Wang{2}, Aileen McGonigal{5}, Hsiang-Yu Yu{4}, Jen-Cheng Hou{1}, Yu Tsao{1}
{1}CITI, Academia Sinica, Taiwan; {2}CITI, Academia Sinica, Microsoft Research, Taiwan; {3}National Taiwan University, Taiwan; {4}Taipei Veterans General Hospital, Taiwan; {5}University of Queensland, Australia
Poster Board: 321

ID: 7032
Swallowing Assessment Using High-Resolution Cervical Auscultations and Transformer-Based Neural Networks
Ayman Anwar{2}, Yassin Khalifa{1}, Erin Lucatorto{1}, James L. Coyle{1}, Ervin Sejdic{2}
{1}University of Pittsburgh, United States; {2}University of Toronto, Canada
Poster Board: 322
ID: 7331
**Audio Cough Analysis by Parametric Modelling of Weighted Spectrograms to Interpret the Output of Convolutional Neural Networks**
Patricia Amado-Caballero{4}, Jose Ramón Garmendia-Leiza{1}, María Dolores Aguilar-García{1}, Carmen Fernández-Martínez-De-Sep{3}, Luis Miguel San-José-Revuelta{4}, Agustín García-Ruano{2}, Carlos Alberola-López{4}, Pablo Casaseca-De-La-Higuera{4}
{1}C.S Los Jardinillos, SACYL, Palencia, Spain; {2}C.S Los Jardinillos, SACYL, Valladolid, Spain; {3}Hospital Universitario de Burgos. SACYL. Burgos, Spain; {4}Laboratory of Image Processing, E.T.S. Ingenieros de Telecomunicación, Universidad de Valladolid, Spain
Poster Board: 323

ID: 7350
**Enhanced Binary Classification of Gait Disorders Using a Machine Learning Majority Voting Approach**
Ahmed Khalil, Muhammad Saad, Kareem Chaar, Reza Tafreshi, Shameel Abdulla, Md Wahid
Texas A&M University at Qatar, Qatar
Poster Board: 324

ID: 7678
**A Nested Cross Validation Approach to Machine Learning Model Performance Evaluation on a Small Dataset for Creutzfeldt-Jakob Disease Diagnosis**
Rishit Chatterjee{1}, Kazutaka Takahashi{2}
{1}Kalyani Public School, India; {2}University of Missouri, United States
Poster Board: 325

ID: 7754
**Leveraging Graph Neural Networks for MIC Prediction in Antimicrobial Resistance Studies**
Zonghan Zhang, Ramyasri Veerapaneni, Moses Ayoola, Athish Ram Das, Zhiqian Chen, Bindu Nanduri, Mahalingam Ramkumar
Mississippi State University, United States
Poster Board: 326

ID: 7851
**Multi-Task Learning Graph Neural Networks for Cancer Prognosis Prediction with Genomic Data**
Tsung-Wei Lin{1}, Sofia Ormazabal Arriagada{2}, Che Lin{1}
{1}National Taiwan University, Taiwan; {2}National Taiwan University, Academia Sinica, Taiwan
Poster Board: 327

ID: 7945
**CGDM-GAN: An Adversarial Network Approach with Self-Supervised Learning for Site Effect Removal**
Xiangxiang Cui{1}, Dongmei Zhi{1}, Weizheng Yan{3}, Vince D. Calhoun{4}, Chuanjun Zhuo{2}, Jing Sui{1}
{1}Beijing Normal University, China; {2}Nankai University, China; {3}National Institutes of Health, United States; {4}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States
Poster Board: 328
Technical Program – Wednesday, July 17th

ID: 7982  
**COINS: Counting Cones Using Inpainting Based Self-Supervised Learning**  
Vidya Bommanapally{2}, Amir Akhavanrezayat{1}, Quan D. Nguyen{1}, Mahadevan Subramaniam{2}  
{1}Stanford University School of Medicine, United States; {2}University of Nebraska Omaha, United States  
Poster Board: 329

ID: 7341  
**Non-Linear Logistic Regression Applied to Radiomics**  
Baptiste Schall{2}, Rodolphe Anty{1}, Lionel Fillatre{2}  
{1}Centre Hospitalier Universitaire de Nice - Hôpital l'Archet 2, France; {2}i3s Laboratory, Université Côte d'Azur, France  
Poster Board: 330

**Wednesday Poster Session - Sleep Bioengineering 2**  
3:30:00 PM - 5:00:00 PM  
Room: Veracruz Hall

ID: 6637  
**Toward Accurate Sleepiness Estimation Modeling from Speech: A Preliminary Study of 25-Hour Sleep Deprivation**  
Jihye Moon, Youngsun Kong, Ki Chon  
University of Connecticut, United States  
Poster Board: 331

ID: 7261  
**Ensemble Learning Approaches for Automatic Detection of Chronic Kidney Disease Stages During Sleep**  
Tae Gwan Jang{2}, So Yeon Park{2}, Ji Ae Lee{2}, Ha Young Park{2}, Tserendulam Dorjmaa{2}, Dongwon Kang{1}, Jae Won Yang{2}, Erdenebayar Urtnasan{2}  
{1}Mediana Co., Ltd, Korea; {2}Yonsei University, Korea  
Poster Board: 332

ID: 7406  
**Non-Contact Assessment of Cardiovascular and Thermoregulatory Function During Exercise After Sleep Deprivation**  
Kanaru Fumimoto, Shima Okada, Masanobu Manno, Yusuke Sakaue, Masaaki Makikawa  
Ritsumeikan University, Japan  
Poster Board: 333

**Wednesday Poster Session - Therapeutic Devices & Systems 3**  
3:30:00 PM - 5:00:00 PM  
Room: Veracruz Hall

ID: 6890  
**High-Resolution Mapping of Gastric Slow Wave Uncoupling Induced by Glucagon**  
Nipuni Nagahawatte, Recep Avci, Leo Cheng  
University of Auckland, New Zealand  
Poster Board: 334
Technical Program – Wednesday, July 17th

ID: 6892
**Distinguishing Mixed MNPs in Handheld Magnetic Particle Imaging Using Multiple Excitation Waveforms**
Bo Zhang{1}, Haoran Zhang{1}, Yu An{1}, Hui Hui{2}, Jie Tian{1}
{1}Beihang University, China; {2}Institute of Automation, Chinese Academy of Sciences, China
Poster Board: 335

ID: 6915
**An Automated Microfluidic Paper-Based Analytical Device for Chemiluminescence Immunoassay**
Jihong Sun{3}, Sixuan Duan{3}, Ruiqi Yong{3}, Hang Yuan{3}, Sanli Liu{3}, Kai Hoettges{2}, Junhui Zhu{1}, Mark Leach{3}, Pengfei Song{3}
{1}Suzhou University of Science and Technology, China; {2}University of Liverpool, United Kingdom; {3}Xi'an Jiaotong-Liverpool University, China
Poster Board: 336

ID: 6983
**Capacitive Tactile Sensor Error Effects on Lesion Sizing in Tactile Breast Screening - A Phantom Study**
Rory Hampson, Alistair Lawley, Nassima Salhi, Gordon Dobie
University of Strathclyde, United Kingdom
Poster Board: 337

ID: 7013
**Wireless Earphone-Based Real-Time Monitoring of Breathing Exercises: A Deep Learning Approach**
Hassam Wazir, Zaid Waghoo, Vikram Kapila
New York University, United States
Poster Board: 338

ID: 7021
**Development of an Electrical Stimulator for Swallow Facilitation Through Action on Spinal Circuits**
In Kitamura{1}, Michael Frazure{2}, Takuji Koike{1}, Kimberly Iceman{3}, Teresa Pitts{3}
{1}University of Electro-Communications, Japan; {2}University of Louisville, United States; {3}University of Missouri, United States
Poster Board: 339

ID: 7042
**Toward Decision Support System for Lower Limb Endovascular Revascularization**
Margaux Roux{3}, Rafaëlle Spear{3}, Pascal Haigron{2}, Alexandre Demeure{1}, Céline Fouard{3}
{1}Laboratoire Informatique de Grenoble, Université Grenoble Alpes, France; {2}Université de Rennes, Inserm, LTSI Institute, France; {3}Université Grenoble Alpes, CNRS, VetAgro Sup, Grenoble INP, CHU Grenoble Alpes, TIMC Laboratory, France
Poster Board: 340
ID: 7062
**Promoting Older Adults' Independent Living with Assistive Technology: Emotional Requirements, Technostress and Formal Caregivers Perspective**  
Laura Fiorini{4}, Jasmine Pani{4}, Erika Rovini{4}, Lara Toccafondi{2}, Novella Calamida{2}, Letizia Lorusso{3}, Sergio Russo{1}, Grazia D’Onofrio{1}, Giuseppina Iannacone{1}, Francesco Giuliani{1}, Kuldar Taveter{5}, Filippo Cavallo{4}  
{1}Fondazione IRCCS Casa Sollievo della Sofferenza, Italy; {2}Umana Persone, Italy; {3}Università degli Studi di Bari Aldo Moro, Italy; {4}Università degli Studi di Firenze, Italy; {5}University of Tartu, Estonia
Poster Board: 341

ID: 7064
**Virtual Reality Game with Haptic Feedback for Upper Limb Rehabilitation in Parkinson’s Disease**  
Meldin Bektic, Brittany Smith, Angela Ridgel, Kwangtaek Kim  
Kent State University, United States
Poster Board: 342

ID: 7185
**Feasibility Study for Controlled Radiation Capsule for High Source Activity for Low Dose Radiation Brachytherapy**  
Junia Nguyen{3}, David Roque{3}, Peter Hesketh{2}, David Yu{1}, Hoseon Lee{3}  
{1}Emory University, United States; {2}Georgia Institute of Technology, United States; {3}Kennesaw State University, United States
Poster Board: 343

ID: 7425
**Susceptibility Assessment of Oscillometry Parameters to Motion Artifact**  
Seyedfakhreddin Nabavi{2}, Lennart K.A. Lundblad{1}, Bryan A. Ross{2}  
{1}McGill University, Canada; {2}RI-MUHC, McGill University, Canada
Poster Board: 344

ID: 7514
**Compact Grism-Based High-Resolution Colorimetric Sensing System for Liquid Samples**  
Gabriel Lachance{2}, Élodie Boisselier{2}, Mounir Boukadoum{1}, Amine Miled{2}  
{1}Université du Québec à Montréal, Canada; {2}Université Laval, Canada
Poster Board: 345

ID: 7532
**Development of a Novel Optimized BioEnvironment for proLonged (NOBEL) Ex Vivo Lung Preservation**  
Chris H.H. Chan{2}, Asma Farooqui{2}, Hadeel Al-Sahli{2}, Abdusalam Elsenousi{1}, Aladdein Mattar{1}, Yaxin Wang{2}, Gabriel Loor{1}  
{1}Baylor College of Medicine, United States; {2}Texas Heart Institute, United States
Poster Board: 346
ID: 7560
**Research on a Resonance Spectrum-Based Method for Measuring the Elastic Modulus of Small Size Soft Tissue Samples**
Yujie Hu, Kecai Lu, Fei Shen, Fan Fan, Yue Wang, Fengji Li, Haijun Niu
Beihang University, China
Poster Board: 347

ID: 7562
**Assessing Basic Emotion via Machine Learning: Comparative Analysis of Number of Basic Emotions and Algorithms**
Caryn Vowles, Mackenzie Collins, Claire Davies
Queen’s University, Canada
Poster Board: 348

ID: 7573
**Effects of a Muscle Energy Technique on Cervical Range of Motion of Neck Pain Patients Measured with Inertial Sensors: A Pilot Study**
Matheus Loureiro{3}, Arlindo Elias{1}, Anselmo Frizera{2}
{1}ESTACIO, Brazil; {2}Federal University of Espírito Santo, Brazil; {3}Universidade Federal do Espírito Santo, Brazil
Poster Board: 349

ID: 7614
**Automatic Monitoring of High-Frequency Autoimmune Disorder Related Seizures with Wearable Devices**
Richard Jie Cui, Andrea Duque Lopez, Gabriella Brinkmann, Boney Joseph, Louis Faust, Julianna Ethridge, Gregory A. Worrell, Divyanshu Dubey, Benjamin Brinkmann
Mayo Clinic, United States
Poster Board: 350

ID: 7831
**Design and Implementation of a Negative Pressure Wound Therapy Device Prototype**
Pierol Quispe, Javier Chang, Fanny L. Casado, Sandra Pérez-Buitrago
Pontificia Universidad Católica del Perú, Peru
Poster Board: 351

ID: 7872
**A New Instrument to Measure Individual Finger Strength in Palmar Grip**
Rafael Santos, Ketlin Santos, Guilherme Nunes Nogueira Neto, Percy Nohama
Pontificia Universidade Católica do Paraná, Brazil
Poster Board: 352

ID: 7904
**Estimating Blood Pressure Measurements Through an Electro-Vascular-Gram: A Pilot Study**
Ali Howidi, Ryan Koh, Paul Yoo
University of Toronto, Canada
Poster Board: 353
ID: 7987  
**SonquSim: Design and Performance Evaluation of an ECG and Arrhythmia Simulator for Medical Devices Calibration**  
Ricardo Muñoz Quiroz, Javier Urbina Alarcón, Harold Aleman Ramirez, José Félix Rosales, Armando Flórez Troncos, Luis Díaz Leguizamón, Mauricio Córdova Torres, Sandra Pérez-Buitrago  
Pontificia Universidad Católica del Perú, Peru  
Poster Board: 354

ID: 8002  
**High-Density Baropodometry Platform Based on Vision Based Tactile Sensing**  
Yueshi Dong{1}, Jiejie Ren{1}, Ningbin Zhang{1}, Weijing Zhao{2}, Jian Zhou{2}, Guoying Gu{1}  
{1}Shanghai Jiao Tong University, China; {2}Shanghai Sixth People’s Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, China  
Poster Board: 355

ID: 8017  
**Automatic Analysis Pipeline of Squatting Ability for Elderly People Based on an Intelligent Platform**  
Lusi A{1}, Tianxiao Li{1}, Juncheng Yu{2}, Chen Zhang{3}  
{1}National Engineering Research Center of Neuromodulation, Tsinghua University, China; {2}Tianjin University, China; {3}Tsinghua University, China  
Poster Board: 356

ID: 8018  
**Multi-Material Cardiac Sleeves with Variable Stiffness Enhance Regional Strain Markers**  
Vahid Naeini{2}, Emilio A. Mendiola{2}, Rana Raza Mehdi{2}, Peter Vanderslice{3}, Vahid Serpooshan{1}, Reza Avazmohammadi{2}  
{1}Georgia Institute of Technology, United States; {2}Texas A&M University, United States; {3}Texas Heart Institute, United States  
Poster Board: 357

ID: 8025  
**Design and Development of 8-DoF Forearm Rehabilitation Device**  
International Institute of Information Technology Bangalore, India  
Poster Board: 358

**WIEBME Keynote**  
4:00:00 PM - 6:00:00 PM  
Room: Monterrey 1

**BNM TC Committee Meeting (Invitation ONLY)**  
4:30:00 PM - 6:30:00 PM  
Room: Sierra 1
## Theme 3 Keynote - Nanomedicine via SANDs, QBET, EXODUS, and Brain Organoid MAP

**4:30:00 PM - 5:30:00 PM**  
**Room: Coronado H-J**

Luke P. Lee is a Professor at Harvard Medical School. He received his BA in Biophysics and Ph.D. in Applied Physics and Bioengineering from UC Berkeley. He joined the faculty at UC Berkeley in 1999 after more than a decade of industry experience. He became the Arnold and Barbara Silverman Distinguished Professor and the Lester John and Lynne Dewar Lloyd Distinguished Professor at Berkeley. He also served as the Chair Professor in Systems Nanobiology at ETH Zürich. He founded the Biomedical Institute for Global Healthcare Research & Technology (BIGHEART). He served as Associate President for International Research and Innovation and Tan Chin Tuan Centennial Professor at the National University of Singapore. He also founded the Institute for Quantum Biophysics at Sungkyunkwan University, Korea. He has authored over 350 research articles, contributed to four book chapters, and holds 60 international patents. He mentored over 100 undergraduate students, 31 Ph.D. candidates, and 37 post-doctoral fellows, producing 35 faculty members at different universities. He has been honored as a Fellow of the Royal Society of Chemistry and the American Institute of Medical and Biological Engineering. He has also received various awards, such as the IEEE William J. Morlock Award, NSF Career Award, Fulbright Scholar Award, and the HoAm Prize.

## WIE Reception

**6:00:00 PM - 7:30:00 PM**  
**Room: Monterrey 2&3**
## Technical Program – Thursday, July 18th

### Registration (Thursday)
8:00:00 AM - 5:00:00 PM  
*Room: Central Registration Counter*

### Speaker Ready Room (Thursday)
8:00:00 AM - 3:30:00 PM  
*Room: El Paso 1-2*

### Plenary Presentation – Forging a New Future: Participatory Action – Design and Engineering Technologies with People with Disabilities
9:00:00 AM - 10:00:00 AM  
*Room: Coronado H-J*

Rory A. Cooper, PhD, PLY is the founding director of the Human Engineering Research Laboratories, a joint center of the University of Pittsburgh (Pitt) and US Department of Veterans Affairs (VA). He is a VA Senior Research Career Scientist and the FISA Foundation – Paralyzed Veterans of America Distinguished Professor at Pitt. Cooper has authored or co-authored over 400 peer-reviewed journal publications. He has 30 patents awarded or pending. He is the author of two books: “Rehabilitation Engineering Applied to Mobility and Manipulation” and “Wheelchair Selection and Configuration”, and co-editor of “An Introduction to Rehabilitation Engineering”, “Warrior Transition Leader: Medical Rehabilitation Handbook” and the award winning book “Care of the Combat Amputee”. Cooper is an elected Fellow of the National Academy of Inventors, as well as RESNA, IEEE, AIMBE and BMES. In October 2023, he was awarded the National Medal of Technology and Innovation by President Biden and he was inducted into the 50th class of the National Inventors Hall of Fame. His students have won numerous awards and are leaders throughout the world.

### BCI - State of the Art and Art of the Possible
10:00:00 AM - 11:30:00 AM  
*Room: Coronado H-J*

### Thursday AM Coffee Break
10:00:00 AM - 11:00:00 AM  
*Room: Veracruz Hall*

### Exhibit Hall Open (Thursday)
10:00:00 AM - 5:30:00 PM  
*Room: Veracruz Hall*

### Students and Young Professionals: Building up your Research Profile Workshop
10:00:00 AM - 11:30:00 AM  
*Room: Baja*
Electromyography Control Applications in Healthcare and Gesture Recognition Methods
10:00:00 AM - 11:30:00 AM
Room: Cancun

This mini-symposium aims to delve into the advanced applications of electromyography (EMG) in healthcare, focusing on innovative control mechanisms and gesture recognition methods. Electromyography, a technique for the acquisition of the electrical activity produced by skeletal muscles, has seen significant advancements in recent years, particularly in the realms of healthcare and human-computer interaction. Led by six distinguished experts, this mini-symposium will explore the dynamic intersection of EMG with advanced healthcare applications and interactive systems. Our expert speakers will present a comprehensive overview, beginning with the integration of high-density sensors and high-resolution sampling, pivotal in enhancing EMG accuracy and functionality. The discussion will extend to the latest in sensor fusion and sophisticated control algorithms, key in improving EMG user interaction. A special emphasis will be on the novel user-in-the-loop myoelectric system learning algorithms, a major advance in developing adaptive systems for daily use. These technological breakthroughs are spearheading a transformation in healthcare, especially in areas like stroke rehabilitation and prosthetic development, paving the way for solutions that are not only more efficient but also intuitively user-centric.

Organizers: Ulysse Côté-Allard{2}, Benoit Gosselin{1}
{1}Laval University, Canada; {2}University of Oslo, Norway

How Start-Up Companies Can Better Position Themselves for Success
10:00:00 AM - 11:30:00 AM
Room: Fiesta 7&8

The Session covers what start-up healthtech/medtech companies can do to better position themselves for success (e.g., investment, strategic partnership, or acquisition). The Session presents strategies to help raise capital, efficient management of limited resources, and lessons learned from past start-up experiences. The Panel expands on what investors are expecting from a pitch made start-ups during fund raising. Strategic partnerships or exit events are covered as well. To that end, the Panel offers recommendations and their unique perspective regarding common pitfalls in the due diligence process. The Panel presents and discusses examples of questions and information requests made by investors, acquirers and other potential strategic partners, during due diligence processes. The Intellectual Property portion of the Session focuses on key aspects of a start-up’s patent portfolio, including patenting roadmap, freedom to operate and third-party risk assessment. The Session provides a checklist of actions to take to strengthen intellectual property assets prior to due diligence activities that occur during fund raising or exit events. The Session is intended to be interactive. Attendees are encouraged to ask questions and offer their viewpoints and experiences regarding intellectual property, start-up formation and sustainability, challenges and the like. Time will be reserved for Q&As, with the audience expected to engage with the panel on IP and start-up topics.

Presenters: Dorin Panescu{1}, Dieter Haemmerich{5}, Punit Prakash{4}, Ted Papagiannis{3}, Michael Christensen{3}, Nitish Thankor{2}
{1}Biotronik, United States; {2}JHU, United States; {3}Knobbe Martens, United States; {4}KSU, United States; {5}MUSC, United States
Recent Advances in Cuffless Blood Pressure Measurement I
10:00:00 AM - 11:30:00 AM
Room: Fiesta 9&10

Cuffless blood pressure (BP) measurement is expected to improve hypertension awareness and control rates and may now be feasible due to recent technological advances in, e.g., wearable sensing and machine learning. As a result, cuffless BP monitoring devices are being widely pursued around the world. However, there are serious challenges in achieving accuracy while offering convenience. This mini-symposium will cover recent advances in cuffless blood pressure measurement and represents part one of two. The speakers are leaders from universities, clinical centers, and companies and will present on topics including clinical validation of methods and calibration-free methods.

Organizer: Ramakrishna Mukkamala
University of Pittsburgh, United States

Digital Oncology: Supporting Clinical Trials with Biomedical Sensors and Wearables in Cancer Treatment and post-Cancer Follow Up
10:00:00 AM - 11:30:00 AM
Room: Monterrey 2&3

The availability and sophistication of mobile health (mHealth) technology (wearables, mobile technology, and sensors) continues to increase and can be considered to be part of what it could be defined as “Digital Health”. The integration of sensors, wearable devices and associated infrastructure is becoming of great importance into the cancer-care continuum, turning into “Digital Oncology”.

Organizer: Maria Eugenia Beltran Jaunsaras
Universidad Politécnica de Madrid, Spain

Cardiovascular Sensing 1
10:00:00 AM - 11:30:00 AM
Room: Monterrey 1
Session Chair: Yeon Noh and Emer Doheny

ID: 6116
Robust Heart Rate Detection via Multi-Site Photoplethysmography
Manuel Meier, Christian Holz
ETH Zürich, Switzerland

ID: 6195
EarSteth: Cardiac Auscultation Audio Reconstruction Using Earbuds
Alvin Cao{5}, Ken Christofferson{4}, Parker Ruth{2}, Naveed Rabbani{1}, Yuanchun Shi{3}, Alex Mariakakis{4}, Yuntao Wang{3}, Shwetak Patel{5}
{1}Harvard Medical School, United States; {2}Stanford University, United States; {3}Tsinghua University, China; {4}University of Toronto, Canada; {5}University of Washington, United States
Morphological Photoplethysmography Features Enhance Stress Detection in Earbud Sensors
Larry Zhang{1}, Viswam Nathan{2}, Christina Rosa{3}, Jilong Kuang{2}, Wendy Mendes{3}, Jun Alex Gao{2}
{1}Indiana University Bloomington, United States; {2}Samsung Research America, United States; {3}University of California San Francisco, United States

Cerebral Blood Flow Monitoring with a Portable Radio Frequency Sensing System
Usman Anwar, Tughrul Arslan, Peter Lomax
University of Edinburgh, United Kingdom

Uncertainty Quantification of Cuffless Blood Pressure with Deep Evidential Regression Model
Zhan Shen, Shuaiting Yao, Yifan Chen, Xiaorong Ding
University of Electronic Science and Technology of China, China

Non-Invasive Assessment of Dynamic Cerebral Blood Flow Using Near-Field Coupling and Synchronized Electrocardiography
Junjie Wang, Gen Li
Chongqing University of Technology, China

Effect of Ultrasound-Induced Temperature on the Dynamics of the Hodgkin-Huxley Neuron
Heba Badawe, Jean Paul Harouz, Massoud Khraiche
American University of Beirut, Lebanon

Emergence of Pathological Slow Waves Due to Elevated Neurotransmitter Release
Md Ashfaq Ahmed{1}, Ranu Jung{2}
{1}Baptist Health South Florida, United States; {2}I3R, University of Arkansas, United States

Reduced Synaptic Heterogeneity in a Tetanus Toxin Model of Epilepsy: Insights from Computational Modeling
Parvin Zarei Eskikand, Mark Cook, Anthony Burkitt, David Grayden
University of Melbourne, Australia
Development of a Multiscale Mechanistic Model for Predicting Tumor Response to Anti-miR-155
Prashant Dogra{1}, Joseph Butner{2}, Vittorio Cristini{1}, Zhihui Wang{1}
{1}Houston Methodist Research Institute, United States; {2}University of Texas M.D. Anderson Cancer Center, United States

Improved Segmentation of Confocal Calcium Videos of HeLa Cells Using Deep-Learning-Assisted Watershed Algorithm
Satya Deepika Neelapala, Suman Gare, Vaibhav Dhyani, Dhruv Srikanth, Soumya Jana, Lopamudra Giri
Indian Institute of Technology Hyderabad, India

On the Processes Leading to Carotenemia-Elicited Changes in the Spectral Responses and Chromatic Attributes of Human Skin
Gladimir Baranoski
University of Waterloo, Canada

Deep Learning for Clinical Applications
10:00:00 AM - 11:30:00 AM
Room: Coronado P&Q
Session Chair: Yuan Yang and Ranadip Pal

Detecting Post-Stroke Aphasia via Brain Responses to Speech in a Deep Learning Framework
Pieter De Clercq, Corentin Puffay, Jill Kries, Hugo Van Hamme, Maaike Vandermosten, Tom Francart, Jonas Vanthornhout
Katholieke Universiteit Leuven, Belgium

Leveraging Deep Learning to Enhance Optical Microphone System Performance with Unknown Speakers for Cochlear Implants
Ji-Yan Han{2}, Jia-Hui Li{2}, Chan-Shan Yang{1}, Fei Chen{3}, Wen-Huei Liao{4}, Yuan-Fu Liao{5}, Ying-Hui Lai{2}
{1}National Taiwan Normal University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan; {3}Southern University of Science and Technology, China; {4}Veterans General Hospital, Taiwan; {5}Yang Ming Chiao Tung University, Taiwan

Efficient Normalized Conformal Prediction and Uncertainty Quantification for Anti-Cancer Drug Sensitivity Prediction with Deep Regression Forests
Daniel Nolte{1}, Souparno Ghosh{2}, Ranadip Pal{1}
{1}Texas Tech University, United States; {2}University of Nebraska-Lincoln, United States
ID: 7164  
**Surgical Suturing Skill Assessment Using Estimated Hand Roll Angle from a Deep-Learning Computer Vision Algorithm**  
Jianxin Gao, Amir Mehdi Shayan, Simar Singh, Joe Bible, Ravikiran Singapogu, Richard Groff  
Clemson University, United States

ID: 7281  
**Cough-DL: A Deep Learning Model for Ear-Worn Cough Detection**  
Bhawana Chhaglani{2}, Ebrahim Nemati{1}, Sharath Chandrashekhara{1}, Jilong Kuang{1}, Jun Alex Gao{1}  
{1}Samsung Research America, United States; {2}University of Massachusetts Amherst, United States

ID: 6508  
**Can Generative AI Learn Physiological Waveform Morphologies? a Study on Denoising Intracardiac Signals in Ischemic Cardiomyopathy**  
{1}Amsterdam University, Netherlands; {2}ETH Zürich, Switzerland; {3}Stanford University, United States

**Digital Assessment of Children Wellbeing: Development, Learning & Recovery**  
10:00:00 AM - 11:30:00 AM  
Room: Fiesta 5&6  
Session Chair: Gelan Ayana and Maria Eugenia Beltran

ID: 6389  
**Analysis of Development Characteristics of Elementary School Children’s Feet Using a Smartphone-Based 3D Foot Scanning System**  
Tomoko Yamashita{4}, Mitsuru Sato{1}, Shuichi Ino{3}, Shingo Ata{2}, Kazuhiko Yamashita{4}  
{1}Gunma Paz University, Japan; {2}Osaka Metropolitan University, Japan; {3}Osaka University, Japan; {4}Tohto University, Japan

ID: 6694  
**Benchmarking Automatic Speech Recognition Technology for Natural Language Samples of Children with and Without Developmental Delays**  
Emma McGonigle{2}, Mark Vandam{3}, Carol Wilkinson{1}, Kristina Johnson{2}  
{1}Boston Children’s Hospital, United States; {2}Northeastern University, United States; {3}Washington State University, United States

ID: 6818  
**Digital Characterization of Primary School Pupils’ Handwriting with a Sensorized Ink Pen**  
Simone Toffoli{2}, Laura Pozzi{2}, Stefania Fontolan{4}, Francesca Lunardini{1}, Milad Malavolti{2}, Chiara Piazzalunga{2}, Linda Greta Dui{2}, Cristiano Termine{4}, Simona Ferrante{3}  
{1}Hospital los Madroños, Spain; {2}Politecnico di Milano, Italy; {3}Politecnico di Milano, IRCCS Istituto Neurologico Carlo Besta, Italy; {4}Università dell'Insubria, Italy
ID: 7122
**Improving Early Prediction of Abnormal Recovery After Appendectomy in Children Using Real-World Data from Wearables**
Rui Hua{3}, Megan O’Brien{3}, Michela Carter{1}, J. Benjamin Pitt{1}, Soyang Kwon{1}, Hassan Ghomrawi{2}, Arun Jayaraman{3}, Fizan Abdullah{1}
{1}Ann and Robert H. Lurie Children’s Hospital of Chicago, United States; {2}Northwestern University, United States; {3}Shirley Ryan AbilityLab, United States

ID: 7280
**Letter Tracing: A Serious Game to Teach Handwriting and Assess Proficiency Through Machine Learning**
Linda Greta Dui{1}, Chiara Piazzalunga{1}, Stefania Fontolan{3}, Marisa Bortolozzo{3}, Sandro Franceschini{3}, Cristiano Terme{3}, Simona Ferrante{2}
{1}Politecnico di Milano, Italy; {2}Politecnico di Milano, IRCCS Istituto Neurologico Carlo Besta, Italy; {3}Università dell’Insubria, Italy

ID: 7856
**A Longitudinal Study on Fingerprint Recognition in Infants, Toddlers, and Children**
Mst Rumana A Sumi, Masudul Haider Imtiaz, Stephanie Schuckers
Clarkson University, United States

**Image-guided Devices & Therapies**
10:00:00 AM - 11:30:00 AM
*Room: Coronado D&E*
Session Chair: Andrei Dragomir and Maria Athanasiou

ID: 6168
**Numerical Modeling and Validation of Combination Embolization-Ablation Therapy in the Liver Using Dynamic Contrast-Enhanced (DCE)-MRI**
Jason Chiang, Hiro Sparks, Frank Hao, Edward Lee, Kyung Sung
University of California, Los Angeles, United States

ID: 6211
**Out-Bore MRI-Guided Breast Biopsy Employing Machine Vision and Augmented Reality Techniques: Preliminary Study**
Sangseo Jeon, Yeonhyeong Kim, Sunghwan Lim
Korea Institute of Science and Technology, Korea

ID: 7006
**Design and Calibration of Dual Sensor: Towards Simultaneous Instrument Tracking and Deformable Shape Sensing in Computer-Integrated Surgery**
Sangseo Jeon{1}, Khaing Thandar Hnin{1}, Yong Gi Jung{2}, Sunghwan Lim{1}
{1}Korea Institute of Science and Technology, Korea; {2}Samsung Medical Center, Korea
ID: 7834
Leveraging Computational Fluid Dynamics for Next-Generation Preoperative Planning in Vascular Surgery
Sreekanth Vemulapalli{1}, Adebayo Adebiyi{2}, Christopher Jensen{1}, Hope Weissler{1}, Taku Inohara{1}, James Chen{1}, Emily Rakestraw{1}, Kevin Southerland{1}, Amanda Randles{1}
{1}Duke University, United States; {2}Northwestern University, United States

ID: 6536
Impact of Gradient Coil Design on Gradient Induced Risks of Implantable Medical Devices in MRI
Boya Xu, Changqing Jiang, Luming Li
Tsinghua University, China

ID: 8078
MRI-Induced RF Heating of Deep Brain Stimulation Devices: In Vivo Predictions and Comparisons Between 0.55 T and 1.5 T
Bhumi Bhusal{1}, Pia Sanpitak{1}, Jasmine Vu{1}, Fuchang Jiang{1}, Jacob Richardson{2}, Nicole Seibertlich{2}, Laleh Golestanirad{1}
{1}Northwestern University, United States; {2}University of Michigan, United States

Methods in Biomechanics & Motor Control
10:00:00 AM - 11:30:00 AM
Room: Durango 2
Session Chair: Brooke Slavens and Satoshi Miura

ID: 7165
A Novel Wrist Device for Characterizing the Components of Proprioceptive Acuity
Jacob Carducci{1}, John Krakauer{2}, Jeremy Brown{1}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University, Johns Hopkins Medicine, United States

ID: 6561
Medical Vs MicroCT Based Finite Element Analysis: Exploring the Influence of Bone Heterogeneity and Bone Geometry
Vineet Seemala{3}, Richard King{2}, Mark Williams{3}, Chandrima Debnath{1}, Arnab Palit{3}
{1}Indian Institute of Technology Kharagpur, India; {2}University Hospitals Coventry, Warwickshire NHS Trust, United Kingdom; {3}University of Warwick, United Kingdom

ID: 6914
Methodology for Measurement In Vivo Ankle Joint Kinematics After Two Different Types of Total Ankle Arthroplasty
Rea Ikeda{3}, Hiroaki Kurokawa{2}, Shinichi Kosugi{1}, Yasuhiro Tanaka{2}, Masataka Yamamoto{3}, Hiroshi Takemura{3}
{1}Kosugi Orthopaedic and Rheumatology Clinic, Japan; {2}Nara Medical University, Japan; {3}Tokyo University of Science, Japan
ID: 7278  
**Spatiotemporal Response Analysis to Simple and Complex Stimuli in Patients with Unilateral Spatial Neglect: 3D Verification Using Immersive Virtual Reality**  
Akira Koshino{3}, Tomoki Akatsuka{3}, Kazuhiro Yasuda{2}, Saki Takazawa{3}, Shuntaro Kawaguchi{1}, Hiroyasu Iwata{3}  
{1}Sonodakai Rehabilitation Hospital, Japan; {2}Tokyo Professional University, Japan; {3}Waseda University, Japan

ID: 6927  
**Reproduction of Central-Brachial-Radial Arterial Blood Pressure Wave Propagation Using a Cardiovascular Hardware Simulator**  
Jae-Hak Jeong, Bomi Lee, Junki Hong, Changhee Min, Adelle Ria Persad, Yong-Hwa Park  
Korea Advanced Institute of Science and Technology, Korea

ID: 7016  
**Kinematics of Single-Plane and Multiplanar Tasks in Adults with Asymptomatic and Symptomatic Wrists**  
Anthony Nguyen{2}, Alyssa Schnorenberg{2}, Sergey Tarima{1}, Kevin Koch{1}, Brooke Slavens{2}  
{1}Medical College of Wisconsin, United States; {2}University of Wisconsin-Milwaukee, United States

**ML Applications for Diagnosis**  
10:00:00 AM - 11:30:00 AM  
Room: Durango 1  
Session Chair: Catherine Stamoulis and Michele Magno

ID: 8021  
**Probabilistic Correspondence Analysis in Pediatric Health by Using Variational Mixture Models**  
Hernán Felipe García Arias{2}, Gloria Liliana Porras-Hurtado{1}, Augusto Enrique Salazar Jimenez{2}, Eliana Vasquez-Osorio{3}, Mauricio Alexander Álvarez López{3}  
{1}Comfamiliar Risaralda, Colombia; {2}Universidad de Antioquia, Colombia; {3}University of Manchester, United Kingdom

ID: 7895  
**Identifying Prediabetes in Canadian Populations Using Machine Learning**  
Katherine Lu{1}, Paijani Sheth{1}, Zhi Lin Zhou{1}, Kamyar Kazari{1}, Aziz Guergachi{2}, Karim Keshavjee{1}, Mohammad Noaeen{1}, Zahra Shakeri{1}  
{1}University of Toronto, Canada; {2}University of Toronto, Toronto Metropolitan University, Canada

ID: 7414  
**Dynamic Multi-Hypergraph Structure Learning for Disease Diagnosis on Multimodal Data**  
Maxime Bollengier{1}, Abel Díaz Berenguer{1}, Hichem Sahli{2}  
{1}Vrije Universiteit Brussel, Belgium; {2}Vrije Universiteit Brussel, IMEC, Belgium
Technical Program – Thursday, July 18th

ID: 7295
**Glucose Prediction Using Population-Based Models and Genetic Data in Type 1 Diabetes Patients**
Daphne N. Katsarou{2}, Eleni I. Georgia{2}, Prodromos Sakaloglou{2}, Maria Christou{1}, Ioannis Georgiou{2}, Stelios Tigas{1}, Costas Papaloukas{3}, Dimitrios I. Fotiadis{3}
{1}University Hospital of Ioannina, Greece; {2}University of Ioannina, Greece; {3}University of Ioannina, FORTH-BRI, Greece

ID: 8109
**Continuous Optimization of a Hierarchical Bayesian Network for Friedreich’s Ataxia Severity Classification**
Sahan Dissanayake{2}, Ragil Krishna{2}, Pubudu N. Pathirana{2}, Malcolm Home{1}, David Smulewicz{1}, Louise Corben{3}
{1}Bionics Institute, Australia; {2}Deakin University, Australia; {3}Murdoch Children's Research Institute, Australia

ID: 6208
**Prediction of Low Bone Mass for Japanese Female Athletes Using Machine Learning**
João Gabriel Segato Kruse{2}, Miki Kaneko{2}, Sayaka Nose-Ogura{1}, Sakiko Kinoshita{3}, Hiroe Nakamura{3}, Osamu Hiraike{3}, Yutaka Osuga{3}, Ken Kiyono{2}
{1}Japan Institute of Sports Sciences, University of Tokyo, Japan; {2}Osaka University, Japan; {3}University of Tokyo, Japan

**Molecular, Infrared & Other Novel Imaging Modalities**
10:00:00 AM - 11:30:00 AM
Room: Yucatan 1
Session Chair: Roberto Lavarello and

ID: 6582
**Simulation Study of a Human-Sized Open-Sided Magnetic Particle Imaging Scanner**
Jie He, Yu An, Jie Tian
Beihang University, China

ID: 6968
**Enhancing Non-Contact Heart Rate Monitoring: An Intelligent Multi-ROI Approach with Face Masking and CNN-Based Feature Adaptation**
Aravind A Anil, Srinivasa Karthik, Mohanasankar Sivaprakasam, Jayaraj Joseph
Indian Institute of Technology Madras, India

ID: 7138
**Developing a Multimodal Prototype Device for Tissue Perfusion Monitoring**
Ivan Soto, Brendan Morris, Barry Claman, John Menezes
University of Nevada, Las Vegas, United States
ID: 7166
3D-LSPTM: An Automatic Framework with 3D-Large-Scale Pretrained Model for Laryngeal Cancer Detection Using Laryngoscopic Videos
Meiyu Qiu{1}, Yun Li{3}, Wenjun Huang{1}, Haoyun Zhang{1}, Weiping Zheng{2}, Xiaomao Fan{1}, Wenbin Lei{3}
{1}Shenzhen Technology University, China; {2}South China Normal University, China; {3}Sun Yat-Sen University, China

ID: 7300
A Deep-Learning-Based Approach for Delirium Monitoring in ICU Patients Using Thermograms
Daniel Blase{2}, Oussama Chayeb{2}, Peter Chan{1}, Steffen Leonhardt{2}, Markus Lueken{2}
{1}Eastern Health, Monash University Melbourne, Australia; {2}RWTH Aachen University, Helmholtz-Institute for Biomedical Engineering, Germany

ID: 7352
Exploring the Feasibility of Investigating Myocarditis Progression Using Histopathological Features from Whole-Slide Images of H&E Tissue
Jiangyin Zhou{1}, Congrui Wang{2}, Xiumeng Hua{2}, Yong Liu{1}, Jiangping Song{2}, Rui Hou{1}
{1}Beijing University of Posts and Telecommunications, China; {2}Fuwai Hospital, China

Neural Signal Processing 1
10:00:00 AM - 11:30:00 AM
Room: Coronado B&C
Session Chair: Chun-Shu Wei and Anu Aggarwal

ID: 6160
Exploring Novel Practical Approach to Post-Stroke Upper-Limb Neurorehabilitation Based on Complex Motor Imagery Tasks
Cristian David Guerrero-Mendez{1}, H. Rivera-Flor{1}, Ana C. Villa-Parra{2}, Teodiano F. Bastos-Filho{1}
{1}Federal University of Espirito Santo, Brazil; {2}Salesian Polytechnic University, Ecuador

ID: 6180
Gamma-Band Inter-Brain Synchrony During Shared Emotional Stimulation in Romantic Relationship
Xiyuan Lei{2}, Jiayang Xu{2}, Anqi Wang{1}, Nantu Hu{1}, Shanbao Tong{2}, Xiaoli Guo{2}
{1}Hangzhou Normal University, China; {2}Shanghai Jiao Tong University, China

ID: 6292
SS-MSDA: Streamlined Sample-Level Multi-Source Domain Adaptation for EEG Emotion Recognition
Jiaheng Wang{1}, Zhenyu Wang{1}, Tianheng Xu{1}, Ting Zhou{3}, Xi Zhao{2}, Honglin Hu{1}
{1}Shanghai Advanced Research Institute, Chinese Academy of Sciences, China; {2}Shanghai University, China; {3}Shanghai University, Shanghai Frontier Innovation Research, China

ID: 6297
Exploration of Task-Specific Components in Different sEMG Features
Yangyang Yuan{1}, Yao Guo{1}, Yonglin Wu{2}, Chenyun Dai{2}, Jionghui Liu{1}
{1}Fudan University, China; {2}Shanghai Jiao Tong University, China
Technical Program – Thursday, July 18th

ID: 6397
**Gender Differences in Hierarchical Cognitive Control of Emotion: An EEG Study**
Wenquan Zhang, Xinyao Li, Pinrong Chen, Bo Zhang, Shuang Liu
Tianjin University, China

ID: 6462
**Toward EEG-Based Objective Assessment of Emotion Intensity**
Pin-Han Ho, Yong-Sheng Chen, Chun-Shu Wei
National Yang Ming Chiao Tung University, Taiwan

### Optical Imaging

**10:00:00 AM - 11:30:00 AM**
**Room: Yucatan 2**
**Session Chair: Edgar Rangel Pieschacon**

ID: 6737
**Single-Wavelength Laminar Optical Tomography for In Vivo Microvascular Three-Dimensional Imaging**
Han Cui, Dewei Han, Wenquan Liu, Xinping Deng, Zhixuan Xin, Guanglin Li
Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

ID: 8014
**NeRF-Based Multi-Frame 3D Integration for 3D Endoscopy Using Active Stereo**
Ryo Furukawa{2}, Ryusuke Sagawa{4}, Shiro Oka{1}, Hiroshi Kawasaki{3}
{1}Hiroshima University Hospital, Japan; {2}Kindai University, Japan; {3}Kyushu University, Japan; {4}National Institute of Advanced Industrial Science and Technology, Japan

ID: 7337
**EUFormer: Learning Driven 3D Spine Deformity Assessment with Orthogonal Optical Images**
Nan Meng, Jason Cheung, Tao Huang, Moxin Zhao, Yue Zhang, Chenxi Yu, Chang Shi, Teng Zhang
University of Hong Kong, Hong Kong

ID: 6962
**Automated Assessment of Simulated Laparoscopic Surgical Performance Using 3DCNN**
David Power{1}, Ihsan Ullah{2}
{1}University College Cork, Ireland; {2}University of Galway, Ireland

ID: 6162
**Embryonic Quality Assessment Using Advanced Deep Learning Architectures Utilizing Microscopic Images of Blastocysts**
Varalakshmi P{1}, Anu Rithiga B{1}, Deepa Varnika B{1}, Sakthi Jaya Sundar Rajasekar{2}
{1}Anna University, India; {2}Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research, India

ID: 6720
**FMT-ReconNet: Fluorescence Molecular Tomography Reconstruction Using Prior Knowledge and Deformation Neural Network**
De Wei, Yizhe Zhao, Shuangchen Li, Heng Zhang, Hongbo Guo, Xiaowei He
Northwest University, China
Signal Processing & Classification for Emotion Recognition
10:00:00 AM - 11:30:00 AM
Room: Coronado M&N
Session Chair: Camilo Valderrama and Suzan Meijs

ID: 6438
Using Attentive Network Layers for Identifying Relevant EEG Channels for Subject-Independent Emotion Recognition Approaches
Camilo Valderrama
University of Winnipeg, Canada

ID: 6173
Robust EEG-Based Emotion Recognition Using an Inception and Two-Sided Perturbation Model
Shadi Sartipi, Mujdat Cetin
University of Rochester, United States

ID: 6970
EEG-Based Emotion Recognition Using Graph Attention Network with Dual-Branch Attention Module
Cheng Li{2}, Sio Hang Pun{3}, Jia Wen Li{1}, Fei Chen{2}
{1}Guangdong Polytechnic Normal University, China; {2}Southern University of Science and Technology, China; {3}State Key Laboratory of Analog and Mixed Signal VLSI, University of Macau, Macau

ID: 7086
Brain-Heart Dynamics: Virtual Reality Explores Theta Band’s Role in Emotion Processing
Edoardo Maria Polo, Andrea Farabbi, Maximiliano Mollura, Luca Mainardi, Riccardo Barbieri
Politecnico di Milano, Italy

ID: 7576
Emotion Recognition from Speech Signals by Mel-Spectrogram and a CNN-RNN
Roneel Sharan{3}, Cecilia Mascolo{2}, Björn Schuller{1}
{1}Imperial College London, United Kingdom; {2}University of Cambridge, United Kingdom; {3}University of Essex, United Kingdom

ID: 6483
Enhancing Emotion Recognition: A Dual-Input Model for Facial Expression Recognition Using Images and Facial Landmarks
Willian Colares, Marly G. F. Costa, Cícero F. F. Costa Filho
Universidade Federal do Amazonas, Brazil
Sleep Bioengineering 1
10:00:00 AM - 11:30:00 AM
Room: Coronado F&G
Session Chair: Azadeh Yadollahi and Thomas Penzel

ID: 6393
**PPG-Based Sleep Staging Using SleepPPGNet: Extension to Wearables, Improvements, Limitations**
{1}Bern University Hospital, University of Bern, St. Claraspital, Switzerland; {2}Centre Suisse d'Élétrocnique et de Microtechnique, Switzerland; {3}École Polytechnique Fédérale de Lausanne, Switzerland; {4}University Hospital of Bern, Switzerland

ID: 7412
**Sleep Structure Discriminates Patients with Isolated REM Sleep Behavior Disorder: A Deep Learning Approach**
Simon Feuerstein{3}, Ambra Stefani{1}, Raphael Angerbauer{1}, Kristin Egger{1}, Abubaker Ibrahim{1}, Evi Holzknecht{1}, Birgit Högl{1}, Antonio Rodríguez-Sánchez{2}, Matteo Cesari{1}
{1}Medical University of Innsbruck, Austria; {2}University of Innsbruck, Austria; {3}University of Innsbruck, Medical University of Innsbruck, Austria

ID: 7729
**Machine Learning Model Combining Ventilatory, Hypoxic, Arousal Domains Across Sleep Better Predicts Adverse Consequences of Obstructive Sleep Apnea**
Sajila Wickramaratne, Korey Kam, Thomas Tolbert, Andrew Varga, Indu Ayappa, David Rapoport, Ankit Parekh
Icahn School of Medicine at Mount Sinai, United States

ID: 7809
**Interactions Between Sleep-Wake Cycle on Balance Control of Elderly People**
Matheus G Nogueira, Guilherme Umemura, Pedro Monteiro, Sandra de Queiroz, Luis Teixeira, Arturo Forner-Cordero
Universidade de São Paulo, Brazil

ID: 7908
**Towards an Accessible Speech-Based Obstructive Sleep Apnea Screening Tool for Underserved Populations**
Behrad Taghibeyglou{1}, Alexander Chow{2}, Parker McLaurin{6}, Oviga Yasokaran{6}, Rene Adams{6}, Majida Mohammed{2}, Mandeep Singh{7}, Najib Ayas{8}, Sachin Pendharkar{4}, Fernanda Almeida{8}, Valeria Rac{6}, Shumit Saha{5}, Azadeh Yadollahi{3}
{1}Institute of Biomedical Engineering, University of Toronto, Canada; {2}KITE Research Institute, Toronto Rehabilitation Institute-University Health Network, Canada; {3}KITE Research Institute, University Health Network, Canada; {4}Medicine/Community Health Sciences, University of Calgary, Canada; {5}Meharry Medical College, United States; {6}Toronto General Hospital Research Institute, University Health Network, Canada; {7}Toronto Western Hospital, University Health Network, Canada; {8}University of British Columbia, Canada
Technical Program – Thursday, July 18th

ID: 7361
**Predicting Sleep Quality via Unsupervised Learning of Cardiac Activity**
*Max Moebus, Julien Wolfensberger, Christian Holz*
*ETH Zürich, Switzerland*

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<th>Student Career/Prof. Dev Session</th>
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<tr>
<td>10:30:00 AM - 12:00:00 PM</td>
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<td>Room: Yucatan 3</td>
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<tr>
<th>WIBME Keynote (Vanessa W.)</th>
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<td>11:30:00 AM - 12:30:00 PM</td>
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<td>Room: Coronado H-J</td>
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<th>WIBME Lunch</th>
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<td>12:30:00 PM - 2:00:00 PM</td>
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<td>Room: Coronado K</td>
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<th>Digital Biomarkers for Brain Health Outcomes</th>
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<td>2:00:00 PM - 3:30:00 PM</td>
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This mini symposium is dedicated to delving into cutting-edge research within the realm of digital biomarkers, with a specific focus on signal analytics and feature engineering towards establishing meaningful biomarkers and exploring their transformative impacts on successful aging. The event will serve as a dynamic platform for researchers and clinicians to present their latest and most innovative findings, providing attendees with valuable insights into extracting meaningful health information from digital sources. Attendees can expect presentations showcasing the state-of-the-art developments in innovative ideas and hypotheses in constructing biomarkers from data collected through different resources and how digital biomarkers serve as indicators for various complications in brain health. The talks will cover the role of digital biomarkers in cognitive aging, Alzheimer's disease and related dementias (ADRD), stroke, and epilepsy. The symposium will not only contribute to the scientific discourse on this topic, but also offer a unique opportunity for knowledge exchange, fostering collaboration among professionals at the forefront of digital biomarker research for healthy aging.

Organizers: Peng Li(4), Fei He(2), Haoqi Sun(1), Lei Gao(4), Chandan Karmakar(3)
{1}Beth Israel Deaconess Medical Center, United States; {2}Coventry University, United Kingdom; {3}Deakin University, Australia; {4}Massachusetts General Hospital, United States
Recent Advances in Cuffless Blood Pressure Measurement II
2:00:00 PM - 3:30:00 PM
Room: Fiesta 9&10

Cuffless blood pressure (BP) measurement is expected to improve hypertension awareness and control rates and may now be feasible due to recent technological advances in, e.g., wearable sensing and machine learning. As a result, cuffless BP monitoring devices are being widely pursued around the world. However, there are serious challenges in achieving accuracy while offering convenience. This mini-symposium will cover recent advances in cuffless blood pressure measurement and represents part two of two. The speakers are leaders from universities, clinical centers, and companies and will present on topics including pulse wave analysis and pulse transit time methods.

Organizer: Ramakrishna Mukkamala, University of Pittsburgh, United States

The Success and Future Promise of Artificial Intelligence (AI) in Ophthalmology
2:00:00 PM - 3:30:00 PM
Room: Monterrey 2&3

This minisymposium topic describing the ways in which AI’s robustness, interpretability, and portability is being advanced in ophthalmology is novel in that it will be the first-of-its-kind at EMBC to bring AI and medical experts together to focus on AI in a particular branch of medicine, especially one which is having so much success. Both the engineering and medical communities that make up EMBC will appreciate such a minisymposium to meet key players in this field, build further collaborations, and add their expertise to the conversation. Towards robustness, we will hear from Luminetics Core creator Dr. Michael Abramoff, whose invention serves as an example of an FDA-approved AI system which is now part of the American Diabetes Association’s Standard Diabetes Care for diabetic retinopathy screening. To enhance generalizability, industry and academic partners alike are working toward federated learning infrastructures to enable training of AI models on datasets from multiple sites while maintaining local privacy. Dr. Minhaj Alam from University of North Carolina at Charlotte will describe his work toward validating such federated learning infrastructures. Toward portability, multiple teams are building low-cost, portable optical coherence tomography (OCT) devices which would make such imaging technology available to broader populations. Dr. Kaveri A. Thakoor, Director of Columbia’s new Artificial Intelligence for Vision Science (AI4VS) Laboratory is developing AI technology which performs with high accuracy even on data collected with low-cost OCT devices. Dr. Thakoor is also developing techniques for making AI more interpretable by training models to align with expert eye movements to enhance AI’s efficiency and to make its mechanisms transparent for clinical users. Dr. Ives Valenzuela, Residency Program Instructor and glaucoma specialist at Columbia, will discuss the role of AI and eye tracking in ophthalmic education. Finally, to show the far-reaching impact of ophthalmology/vision science on overall body/brain health, we will hear from Dr. Serra Favila, newly-appointed Assistant Professor in the Department of Cognitive, Linguistic, and Psychological Sciences at Brown University, on the role of eye movements in working memory and cognition. The symposium will be kicked off by EMBS President Dr. Paul Sajda and Columbia Ophthalmology Department Chair Dr. George “Jack” A. Cioffi.

Organizers: Kaveri Thakoor{1}, Ives Valenzuela{1}, Serra Favila {2}, Michael Abramoff{3}, Minhaj Alam{4}, George Cioffi{1}
{1}Columbia University Irving Medical Center, United States; {2}Brown University, United States; {3}University of Iowa, United States; {4}University of North Carolina, Charlotte, United States
Technical Program – Thursday, July 18th

Biomedical Engineering Education & Curriculum
2:00:00 PM - 3:30:00 PM
Room: Fiesta 7&8
Session Chair: Hans van Oostrom and Tianruo Guo

ID: 6047
Child-Centered, Interdisciplinary Bioengineering Summer Research Experience
Ayshka Rodriguez, Mary Lundy, Debra Depto-Hoffman, Juan Aceros
University of North Florida, United States

ID: 6402
MultiAR: A Multi-User Augmented Reality Platform for Biomedical Education
Markus Perz{1}, Gijs Luijten{2}, Jens Kleesiek{4}, Dieter Schmalstieg{3}, Jan Egger{4}, Christina Gsaxner{1}
{1}Graz University of Technology, Austria; {2}Technische Universität Graz, Austria; {3}Universität Stuttgart, Germany; {4}University Medicine Essen, Germany

ID: 6891
Undergraduate Education in Computational Pathology Through Global Health Inspired Projects
Avery Maddox, Robin Fowler, Ellen Solomon, Arvind Rao
University of Michigan, United States

ID: 7484
Understanding Adherence to Medication in Chronic Patients: A Comprehensive Approach for Optimization and Analysis of Structural Factors
Peña Arroyo{3}, Miguel Rujas{3}, Beatriz Merino-Barbancho{3}, Rodrigo Martín Gómez Del Moral Herranz{3}, Jaime Barrio Cortes{1}, Ana Isabel Villimar Rodríguez{1}, Beatriz Benito{1}, Jim Ingebritsen Carlson{2}, Francisco Lupiañez{2}, María Teresa Arredondo
{1}Fundación para la Investigación e Innovación Biosanitaria en Atención Primaria, Spain; {2}PredictBy Research and Consulting and Universitat Oberta de Catalunya, Spain; {3}Universidad Politécnica de Madrid, Spain

ID: 7047
Enhancing IV Insertion Skill Training: Integrating Bimanual Haptic Feedback in Mixed Reality
Jin Woo Kim, Jarrett Woo, Jeremy Jarzembak, Jennifer Biggs, Ann James, John Dunlosky, Robert Clements, Kwangtaek Kim
Kent State University, United States

ID: 6946
"EpilepSee" Glasses: A Wearable Seizure Prevention Device for Photosensitive Epilepsy
George Crooks{3}, James Perks{3}, Frances Gawne{2}, Hasan Ali{3}, Harrison Steel{3}, Timothy Denison{3}, Antonio Valentin{1}
{1}King’s College London, United Kingdom; {2}University College London, United Kingdom; {3}University of Oxford, United Kingdom
A 3-D Printed Microfluidic Device Enabling Efficient Bioparticle Conjugation in Biological Assays
Muhammad Tahir, Brandon Ashley, Umer Hassan
Rutgers University, United States

Characterisation of Polymer Materials for the Development of an Artificial Urethra
Quentin De Menech{1}, Loriane Andre{2}, Stefania Konstantinidi{1}, Amine Benouhiba{1}, Thomas Martinez{1}, Yoan Civet{1}, Adrien Baldit{3}, Yves Perriard{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}ENIM, Switzerland; {3}Université de Lorraine, Switzerland

Structural and Biocompatibility Challenges for 3D Printed Microfluidic Devices for IVF
Elena Mancinelli, Andreia Santos Miranda, Helen Picton, Virginia Pensabene
University of Leeds, United Kingdom

3D-Printed Scaffold Mimicking IBD Gut Microenvironments: An In Vitro Model for Bacterial Bioink Growth
Tecnológico de Monterrey, Mexico

Clean Synthesis of ZnO-Au Nanoconjugate Inks for Bandgap Tuning Applications
Harikrishnan Muraleedharan Jalajamony, Soumadeep De, Renny Fernandez
Norfolk State University, United States

Exploiting Bacterial Shuttles: Enhancing Deep Tissue Delivery of Nanoparticles for Targeted Cancer Therapy
Yonghwa Lim{2}, Dohyub Jang{2}, Jihwan Park{2}, Heungjin Jeon{1}, Hyojin Lee{1}, Sehoon Kim{2}, Seungbeum Suh{2}
{1}Chungnam National University Hospital, Korea; {2}Korea Institute of Science and Technology, Korea
ID: 7137
**Minimally Invasive Monitor of Cardiac Output Based on the Machine-Learning Analysis of the Pulse Contour of the Peripheral Arterial Pressure**
{1}Akita Cerebrospinal and Cardiovascular Center, Japan; {2}National Cerebral and Cardiovascular Center, Japan; {3}NTT Research, Inc., United States

ID: 7330
**Wearable Acceleration Plethysmography for Carotid Pulse Pressure Monitoring: A Feasibility Study**
V V Girish, Rahul Manoj, P. M. Nabeel, Jayaraj Joseph
Indian Institute of Technology Madras, India

ID: 7333
**Heart-Carotid Pulse Wave Velocity for Non-Invasive Vascular Stiffness Assessment: A Feasibility Study**
Ishwarya S, Raj Kiran V, P. M. Nabeel, Jayaraj Joseph
Indian Institute of Technology Madras, India

ID: 7465
**Towards a Wearable, High Precision, Multi-Functional Stethoscope**
Declan Duggan{2}, Volodymyr Sarana{2}, Andreea Factor{2}, Viktorya Shelevytska{1}, Andriy Temko{2}, Emanuel Popovici{2}
{1}Dnipro State Medical University, Ukraine; {2}University College Cork, Ireland

ID: 6421
**MR-Conditional Lower Body Negative Pressure Chamber: Impact of Subject Position on Autonomic Response**
Cecilia Vivarelli, Eugenio Mattei, Matteo Mancini, Giovanni Calcagnini
Italian National Institute of Health, Italy

ID: 7204
**Comparison of Oximetry Event Desaturation Transient Area-Based Methods in Predicting Cardiovascular Disease Mortality Outcomes**
Siying He, Peter Cistulli, Philip de Chazal
University of Sydney, Australia
Cardiovascular Sensing 2
2:00:00 PM - 3:30:00 PM
Room: Monterrey 1
Session Chair: In Cheol Jeong and Paurakh Rajbhandary

ID: 7218
Continuous Blood Pressure Monitoring and Hypertension Risk Screening Using Smart Watch
Xiaoyu Li{2}, Ramy Hussein{2}, Guangpu Zhu{2}, Xin Sui{2}, Hongwei Li{1}, Xiajiao Yang{1}, Zijing Zeng{2}, Yelei Li{2}
{1}Hospital of Chengdu Office of People’s Government of Tibetan Autonomous Region, China; {2}OPPO Health Lab, United States; {2}OPPO Health Lab, China

ID: 7485
Heart Rate Estimation Using On-Nail Wearable Photoplethysmography
Nur Alia Athirah Binti Hj Mohtadzar{2}, Ertan Balaban{2}, Christopher Beach{2}, Paul Taylor{1}, Robert Horne{1}, John Batchelor{1}, Alexander Casson{2}
{1}University of Kent, United Kingdom; {2}University of Manchester, United Kingdom

ID: 7794
Capturing Physiological Correlates of Stress-Induced Blood Pressure Elevation Using a Multimodal Wearable Sensing Patch in Patients with a History of Myocardial Infarction
Afra Nawar{2}, Jesus Sanchez-Perez{2}, Farhan Rahman{2}, Asim Gazi{2}, Michael Chan{2}, Carrie Ziegler{1}, Obada Daaboul{1}, George Haddad{1}, Omar Al-Abboud{1}, Hashir Ahmed{1}, Nancy Murrah{1}, Viola Vaccarino{1}, Amit Shah{1}, Omer Inan{2}
{1}Emory University, United States; {2}Georgia Institute of Technology, United States

ID: 7800
Capacitive ECG Circuit with Fast Recovery for Continuous Exercise Monitoring
Dansong Li{1}, Reiji Hattori{1}, Satoshi Matsunuma{2}
{1}Kyushu University, Japan; {2}Maxell, Ltd, Japan

ID: 7885
Design and Evaluation of Ear-ECG System
Adarsh A, Jhanavi R, Tanuja Jayas, Amagond Biradar, Kartik Muralidharan, Arpan Pal, Jayavardhana Gubbi
Tata Consultancy Services Limited, India

ID: 7976
Introducing We-Be Band: An End-to-End Platform for Continuous Health Monitoring
Ruoyu Zhang{2}, Ruijie Fang{2}, Mahdi Orooji{1}, Houman Homayoun{3}
{1}Health e-Tile, United States; {2}University of California, Davis, United States; {3}University of California, Davis, Health e-Tile, United States
Drug Delivery Systems
2:00:00 PM - 3:30:00 PM
Room: Coronado D&E
Session Chair: Geoffrey Gray and Jason Chiang

ID: 6518
A Soft Mist Inhaler with Sound and Motion Sensors for Improving Drug Usage Efficiency
Mou-Wei Chang{3}, Chun-Wei Chiu{3}, Fang-Hao Hsiao{3}, Hsuan-Yu Chen{1}, Wen-Jui Wu{2}, Yu-Te Liao{3}
{1}Academia Sinica, Taiwan; {2}Mackay Memorial Hospital, Taiwan; {3}National Yang Ming Chiao Tung University, Taiwan

ID: 6689
Synergistic Enhancement of TNBC Treatment in African American Women: Integrating Resveratrol with Electrical Pulse Therapy
Pragatheiswar Giri, Ignacio Camarillo, Raji Sundararajan
Purdue University, United States

ID: 7100
A Smart Strategy for Photoresponsive Molecules: Utilizing Generative Pre-Trained Transformer and TDDFT Calculations in Drug Delivery
Junjie Hu{1}, Peng Wu{3}, Qi Li{1}, Shiyi Wang{1}, Xianglu Xiao{2}, Zhangming Niu{2}, Binju Wang{4}, Guang Yang{1}
{1}Imperial College London, United Kingdom; {2}MindRank Technologies Limited, United Kingdom; {3}Ningxia University, China; {4}Xiamen University, China

ID: 7452
Hitchhiking Calvaria Immune Cells to Bypass BBB for CNS Drug Delivery Through Transcranial Nanoparticle Microinjection
Xize Gao{2}, Jiacong Li{2}, Chengqian Cui{2}, Jing Xu{2}, Yilong Wang{1}, Mingjun Zhang{2}
{1}Beijing Tiantan Hospital, China; {2}Tsinghua University, United States; {2}Tsinghua University, China

ID: 7555
Stimulated Drug Release to Human Melanoma Cell Line Using NIR-Responsive PLGA Microparticles
Mishal Pokharel, Mariana Katharine Hebert, Aishwariyaraksha Siddharthan, Menaka Konara, Kihan Park
University of Massachusetts Dartmouth, United States

ID: 7928
Towards Fluorescent-Tag-Less Viral Titration: Automated Estimation of Cell-Size Distribution and Infection Level from Phase-Contrast Microscopy Using Deep Learning and Transfer Learning
Jagadeesh Mahadevan, Nishant Bogoria, Satya Deepika Neelapala, Dhruv Srikanth, Soumya Jana, Kishalay Mitra, Lopamudra Giri
Indian Institute of Technology Hyderabad, India
Functional Connectivity, Directionality, & Causality
2:00:00 PM - 3:30:00 PM
Room: Coronado P&Q
Session Chair: Lei Ding and Suzan Meijs

ID: 6830
**Extracting Transient Phase-Amplitude Coupling from Resting-State EEG Signals**
Alper Er[3], Michel Le Van Quyen[2], Julien Dauguet[1], Véronique Marchand-Pauvert[2], Guillaume Marrelec[2]
{1}CNRS, Inserm, France; {2}INSERM, France; {3}Sorbonne Université, France

ID: 6325
**Enhanced Long-Range Communication Among Large Scale Brain Networks During the Pre-Microsaccadic Period**
Ying Gao[1], Huiquang He[1], Bernhard Sabel[2]
{1}Institute of Automation, Chinese Academy of Sciences, China; {2}Otto-von-Guericke-Universität Magdeburg, China

ID: 6419
**Graph Dictionary Learning for the Study of Human Motion**
Marion Chauveau, Antoine Mazarguil, Laurent Oudre
ENS Paris-Saclay, France

ID: 7553
**Spectral Graph Theory to Investigate Topological and Dynamic Properties of EEG-Based Brain Networks: An Application to Post-Stroke Patients**
Andrea Ranieri[2], Floriana Pichiorri[1], Elena Mongiardini[3], Emma Colamarino[3], Febo Cincotti[3], Donatella Mattia[1], Jlenia Toppi[3]
{1}Fondazione Santa Lucia IRCCS, Italy; {2}Sapienza Università di Roma, Italy; {3}Sapienza Università di Roma, Fondazione Santa Lucia IRCCS, Italy

ID: 7162
**Functional Brain Network Alterations Against Scaling**
Abdelrahman Eldaly, Guanrong Chen, Leanne Lai-Hang Chan
City University of Hong Kong, Hong Kong

ID: 7591
**Brainstem and Deep Gray Nuclei Modulate Brain Network Efficiency in Low-Risk Term Newborns**
Venkata Chaitanya Chirumamilla[1], Sarah B Mulkey[1], Tayyba Anwar[1], Robin Baker[2], G. Larry Maxwell[2], Josepheen De Asis-Cruz[1], Kushal Kapse[1], Catherine Limperopoulos[1], Adre Du Plessis[1], R. B. Govindan[1]
{1}Children’s National Hospital, United States; {2}Inova Women’s and Children’s Hospital, United States
Assessment of Force Feedback Models in a Haptic Device Using Alignment Accuracy and Brain Activity
Harutake Nagai, Satoshi Miura
Tokyo Institute of Technology, Japan

Exploring Kinematics Contribution to the Arm Stiffness Modulation During Overground Physical Human-Robot Interaction
Mohsen Mohammadi Beirami, Sambad Regmi, Devin Burns, Yun Seong Song
Missouri University of Science and Technology, United States

Differences in Optimal Control Strategies for Bimanual Coordination Between Dominant and Non-Dominant Hands in Teleoperation
Ryuki Sakurai, Satoshi Miura
Tokyo Institute of Technology, Japan

Scalable, Fast, Highly-Accurate Human-to-Robot Skill Transfer for the Dexterous, Efficient Operation of Histology Microtomes
Felipe Sanches{2}, Geng Gao{1}, Nathan Elangovan{2}, Ricardo V. Godoy{2}, Tom White{1}, Patrick Jarvis{1}, Minas Liarokapis{2}
{1}Acumino, New Zealand; {1}Acumino, United States; {2}University of Auckland, New Zealand

On Human to Robot Skill Transfer for the Execution of Complex Tactile American Sign Language Tasks with a Bimanual Robot Platform
Che-Ming Chang, Felipe Sanches, Geng Gao, Minas Liarokapis
University of Auckland, New Zealand

Neurocognitive Assessment Under Various Human-Robot Teaming Environments
{1}Syracuse University, United States; {2}University of Maryland, College Park, United States
**Image Registration**
2:00:00 PM - 3:30:00 PM  
*Room: Yucatan 1*  
Session Chair: Lejla Alic and Reza Tafreshi

ID: 6919  
**CBCRnet: A Contrastive Learning-Based Multi-Modal Image Registration via Bidirectional Cross-Modal Attention**  
Pengfei Yin, Jisu Hu, Xusheng Qian, Yakang Dai, Zhiyong Zhou  
Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, China

ID: 6059  
**Fast Diffeomorphic Image Registration Using Patch Based Fully Convolutional Networks**  
Jiong Wu{1}, Shuang Zhou{1}, Li Lin{2}, Xin Wang{1}, Wenxue Tan{1}  
{1}Hunan University of Arts and Science, China; {2}University of Hong Kong, China

ID: 6256  
**Automatic Cranial Defect Reconstruction with Self-Supervised Deep Deformable Masked Autoencoders**  
Marek Wodzinski{2}, Daria Hemmerling{1}, Mateusz Daniol{1}  
{1}AGH University of Krakow, Poland; {2}AGH University of Krakow, University of Applied Sciences Western Switzerland, Poland

ID: 7712  
**Physics-Informed Motion Registration of Lung Parenchyma Across Static CT Images**  
Sunder Neelakantan{1}, Tanmay Mukherjee{1}, Kyle Myers{1}, Rahim Rizi{2}, Reza Avazmohammadi{1}  
{1}Texas A&M University, United States; {2}University of Pennsylvania, United States

ID: 8050  
**Spinal Ligaments Detection on Vertebrae Meshes Using Registration and 3D Edge Detection**  
Ivanna Kramer, Lara Blomenkamp, Kevin Weirauch, Sabine Bauer, Dietrich Paulus  
Universität Koblenz, Germany

**Imaging Informatics**
2:00:00 PM - 3:30:00 PM  
*Room: Durango 1*  
Session Chair: June-Woo Kim and Marco Simoes

ID: 6183  
**TGMT: A Terminology-Guided Multi-Task Approach for Lung Cancer CT Report Generation**  
Hui Su{2}, Bing Liu{1}, Xiaofeng Zhu{2}, Xudong Lu{3}, Nan Wu{1}, Danqing Hu{2}  
{1}Peking University Cancer Hospital and Institute, China; {2}Zhejiang Lab, China; {3}Zhejiang University, China
Technical Program – Thursday, July 18th

ID: 7273
**Skin Depolarization for Living-Skin Tissue Segmentation: A Quantitative Comparison with PPG Imaging**
Huaijing Shu{1}, Dongmin Huang{1}, Liyuan Huang{1}, Liping Pan{2}, Jia Huang{2}, Hongzhou Lu{2}, Wenjin Wang{1}
{1}Southern University of Science and Technology, China; {2}Third People's Hospital of Shenzhen, China

ID: 7613
**Tensor Decomposition to Identify Context-Aware Spatial Neighborhoods in the Tumor Microenvironment**
Reva Kulkarni, Gauri Patel, Joel Eliason, Arvind Rao
University of Michigan, United States

ID: 7907
**Exploring the Impact of Acquisition and Reconstruction Parameters on an Imaging-Based Lung Cancer Risk Model**
Luoting Zhuang, Anil Yadav, Grace Kim, Hossein Tabatabaei, Ashley Prosper, William Hsu
University of California, Los Angeles, United States

ID: 6693
**Deep Learning Analysis of Retinal Structures and Risk Factors of Alzheimer's Disease**
Seowung Leem, Yunchao Yang, Adam Woods, Ruogu Fang
University of Florida, United States

ID: 7220
**Can Camera-PPG Imaging Be Used to Measure Perfusion Index?**
Zhiyuan Xu{1}, Yukai Huang{2}, Ningbo Zhao{3}, Jia Huang{3}, Hongzhou Lu{3}, Wenjin Wang{1}
{1}Southern University of Science and Technology, China; {2}Southern University of Science and Technology, Zhejiang University of Technology, China; {3}Third People's Hospital of Shenzhen, China

**MRI Processing**
2:00:00 PM - 3:30:00 PM
Room: Yucatan 2
Session Chair: Lejla Alic and Rana Raza Mehdi

ID: 6521
**Linear Assumptions Based RF Pulse Calibration Framework Using the Bloch-Siegert Shift**
Huabin Zhang{1}, Yufu Zhou{2}, Yongxiang Fang{1}, Jiantai Zhou{1}, Bensheng Qiu{1}
{1}University of Science and Technology of China, China; {2}University of Science and Technology of China, Fuqing Medical Co., Ltd., China

ID: 7855
**Optimizing Dipole-Dipole Relaxation Resilience to Off-Resonance Fields During Adiabatic T1ρ**
Chiara Coletti, Mark Vermeulen, Sebastian Weingärtner
Delft University of Technology, Netherlands
ID: 8092
**Gadolinium Solutions as Post-Mortem Magnetic Resonance Imaging Fiducial Markers and Intravascular Contrast Agents**
Noa Nuzov{1}, Andrew Crofton{1}, Michael Markley{3}, Chris Flask{3}, Ari Blitz{3}, Nicole Pelot{2}, Andrew Shoffstall{1}
{1}Case Western Reserve University, United States; {2}Duke University, United States; {3}University Hospitals Medical Center and Case Western Reserve University, United States

ID: 7237
**Spatial Attention-Enhanced Encoder-Decoder Network for Accurate Segmentation of the Prostate’s Transition Zone**
Dimitrios Zaridis{4}, Eugenia Mylona{1}, Nikolaos S. Tachos{5}, Charalampos Kalantzopoulos{1}, Kostas Marias{2}, Manolis Tsiknakis{3}, Dimitrios I. Fotiadis{5}
{1}FORTH-BRI, Greece; {2}FORTH-ICS-CBML, Greece; {3}Hellenic Mediterranean University, FORTH-ICS-CBML, Greece; {4}National Technical University of Athens, Greece; {5}University of Ioannina, FORTH-BRI, Greece

ID: 6917
**A Multi-Contrast Translation-Based Registration Approach for Distortion Correction in DTI**
Ya Cui{1}, Siyu Yuan{1}, Zhenkui Wang{2}, Li Tong{2}, Jie Luo{1}
{1}Shanghai Jiao Tong University, China; {2}Shanghai United Imaging Healthcare, China

ID: 7981
**Beyond Artifacts: Rethinking Motion-Related Signals in Resting-State fMRI Analysis**
Samujjwal Kumar{1}, Spencer Kinsey{1}, Kyle M. Jensen{1}, Prerana Bajracharya{1}, Vince D. Calhoun{2}, Armin Iraji{2}
{1}TReNDS Center, Georgia State University, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States

**Neural Signal Processing 2**
2:00:00 PM - 3:30:00 PM
*Room: Coronado B&C*
Session Chair: Mathew Yarossi and Andrei Dragomir

ID: 6701
**A Parallel-Double-Thread Online EMG Decomposition Approach by Alternating and Updating Motor Unit Separation Vectors**
Yixin Li, Yang Zheng
Xi’an Jiaotong University, China

ID: 6846
**Enhancing the Myoelectric Pattern Recognition Robustness to Electrode Shift by an Autoencoder-Based Feature Calibrator**
Ge Gao{2}, Yao Li{2}, Yuwen Ruan{1}, Yunfei Liu{2}, Xu Zhang{2}
{1}Penn State University, United States; {2}University of Science and Technology of China, China
Technical Program – Thursday, July 18th

ID: 6933
**Contrastive Self-Supervised EEG Representation Learning for Emotion Classification**
Keya Hu{1}, Ren-Jie Dai{2}, Wen-Tao Chen{1}, Hao-Long Yin{1}, Bao-Liang Lu{1}, Wei-Long Zheng{1}
{1}Shanghai Jiao Tong University, China; {2}Tongji University, China

ID: 6950
**Data-Driven Discovery of the Central Autonomic Network: Dynamic Integration of HRV and Multivariate fMRI Connectivity**
Federica Goffi{2}, Pierluigi Reali{2}, Adele Ferro{1}, Giandomenico Schiena{1}, Fabio Triulzi{1}, Anna Maria Maddalena Bianchi{2}, Paolo Brambilla{3}, Eleonora Maggioni{2}
{1}Fondazione IRCCS Ca’ Granda-Ospedale Maggiore Policlinico, Italy; {2}Politecnico di Milano, Italy; {3}Università degli Studi di Milano, Italy

ID: 6977
**Firing Pattern of Cells in the Hippocampus and Basolateral Amygdala During Novelty Recognition**
Xiaoxin Ren, Yimeng Wang, Ling Wang, Jiajia Yang, Chenguang Zheng
Tianjin University, China

ID: 6988
**The Pattern of CA1 c-Fos Expressing Place Cells Correlates with Learning Progression**
Ning Wang, Anqi Zhang, Jiajia Yang, Ling Wang, Chenguang Zheng
Tianjin University, China

**Neural Stimulation & Modulation 1**
2:00:00 PM - 3:30:00 PM
*Room: Coronado A*
Session Chair: Yuan Yang and Michela Chiappalone

ID: 6026
**Bilateral High-Definition Transcranial Direct Current Stimulation for Upper Extremity Rehabilitation in Stroke**
Jordan N. Williamson{1}, Shirley James{2}, Dorothy He{2}, Rita Huan-Ting Peng{1}, Beni E. Mulyana{1}, Yuan Yang{1}
{1}University of Illinois Urbana-Champaign, United States; {2}University of Oklahoma Health Sciences Center, United States

ID: 6405
**Transcutaneous Auricular Vagus Nerve Stimulation Does Not Modulate Working Memory Capacity but Alters Pupillary Responses in the Change Detection Task**
Jingxin Chen, Yufeng Ke, Guangjian Ni, Dong Ming
Tianjin University, China

ID: 6767
**Computational Modeling of Dorsal Root Ganglion Stimulation: Understanding Pain Suppression Mechanisms**
Sajjad Rigi Ladez, Jia Liu, Longtu Chen, Bin Feng
University of Connecticut, United States
ID: 6835
**Comparison of Blood Pressure Modulation by Low-Intensity Focused Ultrasound Stimulation of Carotid Sinus, Nodose Ganglion, and Vagus Nerve**
Jingjing Wei, Ning Ji, Lin Wang, Xinyu Wu, Guanglin Li, Wan-Hua Lin
Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

ID: 7015
**Predicting Anodal Block with Spatial Distribution of Myelinated Fibers in a Rat Sciatic Model**
Daniel Tovbis, Ryan Koh, Rania Jeong, Paul Yoo
University of Toronto, Canada

ID: 7019
**An Aerosol Jet Printed Microcoil for Cochlear Micromagnetic Stimulation**
Shambavi Ganesh{2}, Ressa Reneth S. Sarreal{3}, David Blake{1}, Srini Tridandapani{4}, Pamela T. Bhatti{2}
{1}Augusta University, United States; {2}Georgia Institute of Technology, United States; {3}Northrop Grumman, United States; {4}University of Alabama at Birmingham, United States

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**Signal Processing & Classification of Photoplethysmographic Signals**
2:00:00 PM - 3:30:00 PM
*Room: Coronado M&N*
Session Chair: Kim Sunghan and Miodrag Bolic

ID: 6444
**Advantages of Modeling Photoplethysmography (PPG) Signals Using Variational Autoencoders**
Abhi Jaiantilal, John Jedziniak, Trent Yarosevich
Impact Vitals, United States

ID: 7051
**Phase Space Reconstruction for Noise-Robust Respiration Rate Estimation from PPG Signal**
Arunkumar Kalimuthu Rameshwaran, Srinivasan Jayaraman
Tata Consultancy Services Limited, United States; Tata Consultancy Services Limited, India

ID: 7111
**Deep Learning-Based Estimation of Arterial Stiffness from PPG Spectrograms: A Novel Approach for Non-Invasive Cardiovascular Diagnostics**
Kiana Pilevar Abrisham{2}, Khalil Alipour{2}, Bahram Tarvirdizadeh{2}, Mohammad Ghamari{1}
{1}Kettering University, United States; {2}University of Tehran, Iran

ID: 7031
**A Framework for Extracting Heart Rate Variability Features from Earbud-PPG for Stress Detection**
Bhanu Teja Gullapalli{2}, Viswam Nathan{1}, Md Mahbubur Rahman{1}, Jilong Kuang{1}, Jun Alex Gao{1}
{1}Samsung Research America, United States; {2}University of California, San Diego, United States
ID: 7620
**A Signal Processing Tool for Extracting Features from Arterial Blood Pressure and Photoplethysmography Waveforms**  
Ravi Pal, Akos Rudas, Sungsoo Kim, Jeffrey Chiang, Maxime Cannesson  
University of California, Los Angeles, United States

ID: 6672
**A Novel Machine-Learning-Based Noise Detection Method for Photoplethysmography Signals**  
Soheil Khooyooz{1}, Anice Jahanjoo{3}, Amin Aminifar{1}, Nima Taherinejad{2}  
{1}Ruprecht-Karls-Universität Heidelberg, Germany; {2}Ruprecht-Karls-Universität Heidelberg, Vienna University of Technology, Germany; {3}Technische Universität Wien, Austria

**Session Chair: Riccardo Barbieri and Marta Carrara**

**Signal Processing for Movement**  
2:00:00 PM - 3:30:00 PM  
Room: Cancun

ID: 6740  
**emg2vec: Self-Supervised Pretraining in Electromyography-Based Silent Speech Interfaces**  
Qinhan Hou{2}, Stefano van Gogh{2}, Kevin Scheck{1}, Zhao Ren{1}, Tanja Schultz{1}, Michael Wand{2}, Jürgen Schmidhuber{2}  
{1}Cognitive Systems Lab, Universität Bremen, Germany; {2}Istituto Dalle Molle di studi sull’Intelligenza Artificiale, Switzerland

ID: 7376  
**Diff-ETS: Learning a Diffusion Probabilistic Model for Electromyography-to-Speech Conversion**  
Zhao Ren{1}, Kevin Scheck{1}, Qinhan Hou{2}, Stefano van Gogh{2}, Michael Wand{2}, Tanja Schultz{1}  
{1}Cognitive Systems Lab, Universität Bremen, Germany; {2}Istituto Dalle Molle di studi sull’Intelligenza Artificiale, Switzerland

ID: 7057  
**StepGAN: Gait Feature Extraction Using Generative Adversarial Networks for Footstep Recognition**  
Robyn Larracy, Shikder Shafiul Bashar, Angkoon Phinyomark, Erik Scheme  
University of New Brunswick, Canada

ID: 7818  
**Capturing Gait Parameters During Asymmetric Overground Walking Using Ultra-Wideband Radars: A Preliminary Study**  
Charalambos Hadjipanayi, Maowen Yin, Timothy Constandinou  
Imperial College London, United Kingdom

ID: 6747  
**Application of TimeGAN to IMU-Based Data of Upper Limb Range of Motion**  
Nishtha Bhagat, Vedant Sanghavi, Vikram Kapila  
New York University, United States
ID: 6827
Dynamic Multi-Modal Fusion for Biosignal-Based Motion Sickness Prediction in Vehicles
Seo-Hyeon Park, Dong-Kyun Han, Seong-Whan Lee
Korea University, Korea

Theme 11 Keynote - Computational Microscopy of Dynamic Samples
3:30:00 PM - 4:30:00 PM
Room: Coronado H-J

Laura Waller is the Charles A. Desoer Professor of Electrical Engineering and Computer Sciences at UC Berkeley. She received B.S., M.Eng. and Ph.D. degrees from the Massachusetts Institute of Technology in 2004, 2005 and 2010. After that, she was a Postdoctoral Researcher and Lecturer of Physics at Princeton University from 2010-2012 before joining UC Berkeley. She is a Packard Fellow for Science & Engineering, Moore Foundation Data-driven Investigator, OSA Fellow, and Chan-Zuckerberg Biohub Investigator. She has received the Carol D. Soc Distinguished Graduate Mentoring Award, OSA Adolph Lomb Medal, NSF CAREER Award and the SPIE Early Career Achievement Award.

Thursday Refreshments
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

Thursday Poster Session - Biomedical and Health Informatics 1.1
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 118002
Closing the AI Generalization Gap Across Different Clinical Settings
Rajeev Rikhye{1}, Rory Sayres{1}, Yun Liu{1}, Justin Ko{2}, Steven Lin{2}
{1}Google Research, United States; {2}Stanford University School of Medicine, United States
Poster Board: 1

ID: 118033
Prognostic Models for Geographic Atrophy Lesion Growth Rate
Alvaro Ulloa Cerna{2}, Jennifer Luu{2}, Tharindu De Silva{2}, Joseph Blair{3}, Rishi Singh{1}, Sara Gale{2}
{1}Cleveland Clinic Foundation, United States; {2}Janssen Research & Development, United States; {3}RetinAI, Switzerland
Poster Board: 2

ID: 118039
Central Apnea Detection in Premature Infants Using Neural Networks
Gabriele Varisco{1}, Zheng Peng{1}, Peter Andriessen{2}, Carola van Pul{2}, Xi Long{1}
{1}Eindhoven University of Technology, Netherlands; {2}Màxima Medical Center, Netherlands
Poster Board: 3
ID: 118048
**Signature Identification for Predicting Clarithromycin Resistance of Nontuberculous Mycobacteria Through Whole Genome Sequencing**
Yann-Jen Ho{2}, Chin-Chung Shu{2}, Mong-Hsun Tsai{2}, Liang-Chuan Lai{2}, Tzu-Pin Lu{2}, Eric Chuang{2}, Chien-Yueh Lee{1}
{1}National Taipei University, Taiwan; {2}National Taiwan University, Taiwan
Poster Board: 4

ID: 118064
**Development of a Deep Learning Machine for Micro-Expression Recognition**
Kazuho Narita, Koya Takahashi, Noriko Hiroi
Kanagawa Institute of Technology, Japan
Poster Board: 5

ID: 118067
**Medication Interoperability: A Complete Medication History**
Zachary Robin, Sahil Malhotra, Hannah Nolte
The MITRE Corporation, United States
Poster Board: 6

ID: 118077
**Comparison of Different Types of Preventive Dental Materials on Enamel Susceptibility to Erosion by Artificial Gastric Juice**
Song-Yi Yang
Konyang University, Korea
Poster Board: 7

ID: 118090
**Abdominal Impedance Measurement Before and After Defecation for Bowel Movement Prediction**
Yuta Ino, Masaki Kyoso
Tokyo City University, Japan
Poster Board: 8

ID: 118099
**Development of an AI Model for Predicting Progressive NASH Based on Blood Biochemical Parameters: Dealing with Imbalanced Medical Data**
Bo-Sheng Huang{2}, Ju-Hsuan Chang{2}, Zhi-Yu Lee{1}
{1}National Feng-Shan Senior High School, Taiwan; {2}National TsingHua University, Taiwan
Poster Board: 9

ID: 118112
**Demographics and Comorbidities as an Atrial Fibrillation Risk Factor: A Retrospective Study in Koreans**
Ye Eun Choi{2}, Jaehyung Lee{2}, Hyeon Seok Seok{1}, Hangsik Shin{2}
{1}Chonnam National University, Korea; {2}University of Ulsan College of Medicine, Korea
Poster Board: 10
Technical Program – Thursday, July 18th

ID: 118126
Physiological Measurement of Music Performance Anxiety in Wind Instrument Players: A Preliminary Study
Sakie Takagi{2}, Akihiko Murai{1}, Michiko Yoshie{1}
{1}National Institute of Advanced Industrial Science and Technology, Japan; {2}The University of Tokyo, Japan
Poster Board: 11

ID: 118132
A Personalized Lifestyle Recommendation System for Mitigating Male Pattern Baldness Risk Through Synthetic Electronic Health Records
Sungjoo Han, Sangyeon Lee, Jaegyun Jung, Doheon Lee
Korea Advanced Institute of Science and Technology, Korea
Poster Board: 12

ID: 118134
Smart IoT-Enabled Approach for Enhancing Push-Up Movements and Mitigating Muscle Fatigue
Rastreeya Vidyalaya College of Engineering, India
Poster Board: 13

ID: 118137
A Diagnostic Method for Alzheimer's Dementia Utilizing Task-Induced EEG Features and Machine Learning
Wei-Hung Kuan{2}, Thanh-Tung Trinh{1}, Yi-Hung Liu{3}, Chun-Ying Lee{1}
{1}National Taipei University of Technology, Taiwan; {2}National Taiwan University of Science and Technology, Taiwan; {3}National Yang Ming Chiao Tung University, Taiwan
Poster Board: 14

ID: 118148
Foot Characteristics Contributing to Midfoot Growth in Elementary School Students: Measured by 3D Foot Scanning
Kazuhiko Yamashita{2}, Tomoko Yamashita{2}, Mitsuru Sato{1}
{1}Gunma Paz University, Japan; {2}Tohto University, Japan
Poster Board: 15

ID: 118150
Estimation of Patient Similarity Through Graph Representation
Thanakorn Kritsrinoppadhato{2}, Sawrawit Chairat{2}, Kamonrat Tangudomkit{2}, Phurit Bovornchutchai{1}, Sitthichok Chaichulee{2}
{1}Mahidol University, Thailand; {2}Prince of Songkla University, Thailand
Poster Board: 16
ID: 118159
**Differential Diagnosis of Alzheimer’s Disease Based on Spatial-Temporal Graph Features**
Jun-En Ding, Jing Wang, Feng Liu
Stevens Institute of Technology, United States
Poster Board: 17

ID: 118184
**Improving Machine Learning Based Sepsis Diagnosis Using Heart Rate Variability**
Sai Balaji{1}, Christopher Sun{2}, Anaiy Somalwar{3}
{1}Academy of Science and Technology, United States; {2}Stanford University, United States; {3}University of California, Berkeley, United States
Poster Board: 18

ID: 118204
**Needle-Shaped Temperature Sensor for Measurement of Deep Body Temperature**
Tadao Matsunaga{1}, Hiromu Okada{1}, Yoshiharu Okamoto{2}, Sang-Seok Lee{1}
{1}Tottori University, Japan; {2}WOLVES HAND CO., LTD., Japan
Poster Board: 19

ID: 118223
**Analysis of Free-Text Medical Notes Quality in the Pediatric Intensive Care Unit at a Quaternary Hospital**
Geoffrey Gray, Brant Tudor, Luis Ahumada
Johns Hopkins All Children’s Hospital, United States
Poster Board: 20

ID: 118245
**Optimization of Clinical Trial Design Based on Reinforcement Learning with Considering Competing Drugs**
Yutaro Kido, Hiroko Otaki, Kunihiko Kido, Wataru Takeuchi
Hitachi, Ltd., Japan
Poster Board: 21

ID: 118252
**Predicting Abeta/Tau Ratios for Alzheimer’s Disease Diagnosis**
Emine Güven{2}, Andrea Pearson{2}, James Lah{1}, Roger Simon{2}, Robert Meller{2}
{1}Emory University, United States; {2}Morehouse School of Medicine, United States
Poster Board: 22

ID: 118276
**Causal Discovery Method for Estimating Intervention Effects**
Yasutaka Hasegawa{2}, Shunsuke Noyama{2}, Takanobu Osaki{2}, Wataru Takeuchi{2}, Hideyuki Ban{2}, Tsutomu Kikuchi{1}
{1}Hitachi Health Insurance Society, Japan; {2}Hitachi, Ltd., Japan
Poster Board: 23
Human Perception Characterization Using Generative AI
Yui Momiyama{2}, Hiroyuki Aso{2}, Hiroki Ishizuka{3}, Takefumi Hiraki{1}, Norihisa Miki{2}
{1}Cluster, Inc., Japan; {2}Keio University, Japan; {3}Osaka University, Japan
Poster Board: 24

Development of Synthetic Health Checkup Data Generation Technology Using Diffusion Model
Shuzo Ishizaka{2}, Yasutaka Hasegawa{2}, Takanobu Osaki{2}, Wataru Takeuchi{2}, Tsutomu Kikuchi{1}
{1}Hitachi Health Insurance Society, Japan; {2}Hitachi, Ltd., Japan
Poster Board: 25

Development of Ultrasonography Training Simulator for Beginners
Aya Sawaguchi, Yurina Sugamiya, Akari Yamada, Takaharu Kaizoji, Atsuo Takanishi
Waseda University, Japan
Poster Board: 26

Modeling the Impact of Low Dose and High Dose Radiation on Mammalian Immune Cells
Tochukwu Olie{1}, Daniel Ajuzie{2}, Azka Ahmed{3}, Jayaraman Tharmalingam{3}, Mark Harvey{1}, Elebeoba May{3}
{1}Texas Southern University, United States; {2}University of Houston, United States; {3}University of Wisconsin-Madison, United States
Poster Board: 27

Enriching Bioengineering Literacy by Integrating Humanities and Arts in an Undergraduate General Education Course
Penelope Georges
Princeton University, United States
Poster Board: 28

Image Quality Assessment for Low-Dose-CT Images of COVID-19 Based on Sparse Representation and Human Visual Characteristics
Rongrong Sun, Mo Shen, Xiaolian Shu
Shanghai Institute of Measurement and Testing Technology, China
Poster Board: 29
The Impact of Color Blindness on Web Navigation
Parham Aarabi
PRE Inc., Canada
Poster Board: 30

SegTNBC: A Refined "Segment Anything (SAM)" Model for MR Images of Triple-Negative Breast Cancer
Zhan Xu, Jong Bum Son, Rania Mohamed, Beatriz Adrada, Peng Wei, Clinton Yam, Gaiane Rauch, Jingfei Ma
The University of Texas MD Anderson Cancer Center, United States
Poster Board: 31

AI-Based Automated Cell Segmentation and Quantification Using MATLAB
Shuang Chang{2}, Rishi Raghavan{2}, Daniel Silverman{2}, Kautilya Vemulapalli{1}, Akhilesh Mishra{1}, Reza Fazel-Rezai{1}
{1}MathWorks, United States; {2}University of California Berkeley, United States
Poster Board: 32

Estimation of Biological Tissue Phantoms Abundance with Linear Unmixing Analysis in Shortwave Infrared Hyperspectral Images
Yi-Jing Sheen, Hsian-Min Chen, Hsin-Che Wang, Chiu-Chin Sung, Yu-Wen Fu
Taichung Veterans General Hospital, Taiwan
Poster Board: 33

Comparing the Performance of Task-Specific and Foundation Models for Depth Estimation in Bronchoscopy
Taemin Choi{1}, Yeongyu Han{1}, Hyunjeong Ki{2}, Seyoung Ku{1}, Saengmyung Hyun{3}, Minwoong Kang{2}, Kyungsang Kim{4}, Dongheon Lee{2}
{1}Chungnam National University College of Medicine, Korea; {2}Chungnam National University College of Medicine and Chungnam National University Hospital, Korea; {3}Chungnam National University Hospital, Korea; {4}Massachusetts General Hospital and Harvard Medical School, United States
Poster Board: 34

Comparing the Performance of Task-Specific and Foundation Models for Automated Trachea Segmentation
Hyeondong Choi{1}, Donghyeon Baek{1}, Jongtak Baek{2}, Jieun Oh{2}, Jihye Heo{2}, Minwoong Kang{2}, Kyungsang Kim{3}, Dongheon Lee{2}
{1}Chungnam National University College of Medicine, Korea; {2}Chungnam National University College of Medicine and Chungnam National University Hospital, Korea; {3}Massachusetts General Hospital and Harvard Medical School, United States
Poster Board: 35
Technical Program – Thursday, July 18th

ID: 118087
Development of an Active Short-Wave Infrared LED Hyperspectral Imaging for the Detection of Diabetic Neuropathy
Hsian-Min Chen{2}, Yi-Jing Sheen{2}, Chiu-Chin Sung{2}, Hsin-Che Wang{2}, Yu-Wen Fu{2}, Tsu-Te Hao{1}
{1}ISUZU OPTICS CORP., Taiwan; {2}Taichung Veterans General Hospital, Taiwan
Poster Board: 36

ID: 118089
Azimuthal Equidistant Projections of CT Scans
Nicolas Hadjittoouli{2}, Christos Nicolaou{1}, Costas Pitris{2}
{1}State Health Service Organization, Cyprus; {2}University of Cyprus, Cyprus
Poster Board: 37

ID: 118091
Automated Analysis of Retinal Videos Acquired with Smartphone Ophthalmoscope for the Screening of Retinal Diseases
Alexa Berto{1}, Fabio Scarpa{2}
{1}University of Padua, Italy; {2}University of Padua, Italy
Poster Board: 38

ID: 118106
Impact of Breast MRI Body Positioning on Transvenous Cardiac AIMD RF Safety Analysis at 1.5T
Xin Huang, Shi Feng, Vick Chen, Shiloh Sison
Abbott, United States
Poster Board: 39

ID: 118108
Is RF-Induced AIMD Device Case Heating Due to Local E-Field Scalable Between 64MHz and 128MHz?
Shi Feng, Shiloh Sison
Abbott, United States
Poster Board: 40

ID: 118115
AI-Accelerated Medical Imaging Diagnostics for eFAST Procedures
Austin Ruiz, Sofia Hernandez Torres, Ryan Ortiz, Lawrence Holland, Saul Vega, Jose Salinas, Eric Snider
United States Army Institute of Surgical Research, United States
Poster Board: 41

ID: 118119
Integrating Imaging and Clinical Data for Enhanced Survival Prediction
Minji Cho, Hyunjin Park
Sungkyunkwan University, Korea
Poster Board: 42
ID: 118123
**Medical Image-Based Automatic Sarcopenia Diagnosis System and its Application: Analysis by Liver Disease**
SiHyeong Noh{1}, DongWook Lim{1}, Go-Eun Lee{1}, Chung Sub Lee{1}, Chang Won Jeong{2}
{1}Wonkwang University, Korea; {2}Wonkwang University Hospital, Korea
Poster Board: 43

ID: 118157
**Prediction of the Postoperative Appearance of Blepharoptosis Based on Generative Adversarial Networks**
Yu-Kuei Lee, Chun-Chieh Lai, Ya-Xing Shih, Shyh-Hau Wang
National Cheng Kung University Hospital, Taiwan
Poster Board: 44

ID: 118167
**Development of AI Guidance and Image Interpretation Models for Guiding Junctional Pressure Point Occlusion**
Sofia Hernandez Torres{2}, Carlos Bedolla{2}, Isiah Mejia{2}, Ryan Ortiz{2}, Austin Ruiz{2}, Jose Salinas{2}, Guy Avital{1}, Eric Snider{2}
{1}Israel Defense Forces Medical Corps, Israel; {2}United States Army Institute of Surgical Research, United States
Poster Board: 45
ID: 118168
**Autonomous Ultrasound Imaging Using a Robotic Platform with Integrated Computer Vision and Deep Learning Models**
Krysta-Lynn Amezcua, Sofia Hernandez Torres, Lawrence Holland, James Collier, Rachel Gathright, Theodore Winter, Austin Ruiz, Jose Salinas, Eric Snider
United States Army Institute of Surgical Research, United States
Poster Board: 46

ID: 118185
**Exploring External Sources for Musculoskeletal Information: Predicting Femur Shape Based on Thigh Structure**
Oulimata Gueye{1}, Valérie Burdin{1}, Guillaume Dardenne{2}, Jocelyne Troccaz{3}
{1}IMT Atlantique, France; {2}INSERM, France; {3}Université Grenoble Alpes, France
Poster Board: 47

ID: 118188
**Increased Frontal Brain Activation in Asymptomatic Carotid Artery Stenosis Patients During Mobility Tasks**
Binal Brahmbhatt{2}, Sarasijhaa Desikan{4}, Vicki Gray{3}, Aman Kankaria{4}, John Anagnostakos{4}, Caroline Crone{4}, John Sorkin{1}, Brajesh Lal{4}, Siddhartha Sikdar{2}
{1}Baltimore VA Geriatric Research, United States; {2}George Mason University, United States; {3}University of Maryland, United States; {4}University of Maryland School of Medicine, United States
Poster Board: 48
Technical Program – Thursday, July 18th

ID: 118189
**Comparative Analysis of Evidential Deep Learning Framework for Uncertainty Quantification in 3D MR Images**
Hamed Zakeri, Farzad Khalvati
University of Toronto, Canada
Poster Board: 49

ID: 118200
**Development of Multiple Medical Information Mediation Platform Supporting CDSS**
Dong Wook Lim{1}, SiHyeong Noh{1}, Go-Eun Lee{1}, Hee-Kyung Moon{1}, Jae Ho Seo{1}, Seong-Kyu Choe{1}, Chang Won Jeong{2}
{1}Wonkwang University, Korea; {2}Wonkwang University Hospital, Korea
Poster Board: 50

ID: 118216
**Ultrasound Quantitative Grayscale Analysis of the Superficial One-Third of Muscle Outperforms Whole Muscle Analysis**
Ajitesh Nanda{1}, Askhat Mukushev{1}, Sarah Verga{1}, Hilda Gutierrez{1}, Soleil Samaan{1}, Teresa Capella{1}, Sophie Ruehr{3}, Courtney McIlduff{1}, Alicia Everitt{2}, Ethan Murphy{2}, Ryan Halter{2}, Seward Rutkove{1}
{1}Beth Israel Deaconess Medical Center, United States; {2}Dartmouth College, United States; {3}University of California, Berkeley, United States
Poster Board: 51

ID: 118227
**Cataract Detection Algorithm to Classify Cataracts Disease Type Based on Features**
Seungyeon Baek{2}, Peter Ho{1}, Jowoon Chong{2}
{1}Lubbock Eyeclinic, United States; {2}Texas Tech University, United States
Poster Board: 52

ID: 118229
**Schizophrenia Patients Have Higher Intra-Network Connectivity Entropy Across Variety Functional Brain Networks**
Natalia Maksymchuk, Robyn Miller, Vince Calhoun
Georgia State University, TReNDS, United States
Poster Board: 53

**Thursday Poster Session - Biomedical Imaging and Image Processing 1.2**
4:30:00 PM - 6:00:00 PM
*Room: Veracruz Hall*

ID: 118231
**Functional Network Connectivity Gradient in Schizophrenia**
Najme Soleimani, Armin Iraji, Vince Calhoun
Georgia State University, TReNDS, United States
Poster Board: 54
ID: 118234
A Comparative Study: Dielectric Property Mapping Approaches for Deep Brain Stimulation Modeling
Jan Philipp Payonk, Karthik Sridhar, Ursula van Rienen, Revathi Appali
University of Rostock, Germany
Poster Board: 55

ID: 118257
Label-Free Hyperspectral Imaging and Convolutional Neural Network for Lipid Nanoparticle Characterization
Kaeul Lim, Arezoo Ardekani
Purdue University, United States
Poster Board: 56

ID: 118269
Component-Correlating U-Net: Graph Neural Network with U-Net for Lung Nodule Segmentation in Computed Tomography
Kuan-Yu Chen{2}, Li-Wei Chen{2}, Ying-Hsuan Chen{2}, Pin-Wen Chen{2}, Mong-Wei Lin{3}, Shun-Mao Yang{3}, Yi-Chang Chen{1}, Min-Shu Hsieh{3}, Jin-Shing Chen{3}, Yeun-Chung Chang{3}, Chung-Ming Chen{2}
{1}Cardinal Tien Hospital, Taiwan; {2}National Taiwan University, Taiwan; {3}National Taiwan University Hospital, Taiwan
Poster Board: 57

ID: 118270
Skeletal Muscle Correlation Analysis Between Lumbar and Thoracic Vertebrae: Investigating the Potential for Sarcopenia Diagnosis in Non-Small Cell Lung Cancer Patients Using Computed Tomography
Ying-Hsuan Chen{2}, Li-Wei Chen{2}, Kuan-Yu Chen{2}, Pin-Wen Chen{2}, Mong-Wei Lin{3}, Shun-Mao Yang{3}, Yi-Chang Chen{1}, Min-Shu Hsieh{3}, Jin-Shing Chen{3}, Yeun-Chung Chang{4}, Chung-Ming Chen{2}
{1}Cardinal Tien Hospital, Taiwan; {2}National Taiwan University, Taiwan; {3}National Taiwan University Hospital, Taiwan; {4}National Taiwan University Hospital, Taiwan,
Poster Board: 58

ID: 118273
Development of an Automated Melanoma Diagnosis System Using a Large-Scale Language Model
Takashi Nagaoka
Kindai University, Japan
Poster Board: 59

ID: 118278
Healing Process Evaluation for Severe Burns Using Image Processing
Tatsuro Yoshikawa{1}, Soichiro Kato{2}, Yoshihiro Yamaguchi{2}, Toshiyuki Tanaka{1}
{1}Keio University, Japan; {2}Kyorin University Medicine, Japan
Poster Board: 60
ID: 118301
Clinical Wound Detection and Classification for Peripheral Arterial Disease Using YOLO-Net Approach
Yu-Chang Chu, Ming-Feng Tsai, Hung-Wen Chiu
Taipei Medical University, Taiwan
Poster Board: 61

ID: 118302
Preoperative Lung Adenocarcinoma Grading with Graph Neural Network Integration of Clinical Parameters and CT Features
Pin-Wen Chen{1}, Li-Wei Chen{1}, Ying-Hsuan Chen{1}, Kuan-Yu Chen{1}, Mong-Wei Lin{2}, Shun-Mao Yang{2}, Yi-Chang Chen{2}, Min-Shu Hsieh{2}, Jin-Shing Chen{2}, Yeun-Chung Chang{2}, Chung-Ming Chen{1}
{1}National Taiwan University, Taiwan; {2}National Taiwan University Hospital, Taiwan
Poster Board: 62

ID: 118306
Validation for Aortic Dissection and Intramural Hematoma Detection on Non-Contrast Computed Tomography Images: YOLOv4 Model
Bitnarae Kim{1}, Gayoung Lee{1}, Wonhee Kim{3}, Yoonje Lee{3}, Hyun Young Choi{3}, Jae Guk Kim{3}, Yu Seop Kim{2}
{1}Hallym Biomedical Informatics Convergence Research Center, Korea; {2}Hallym University, Korea; {3}Hallym University Kangnam Sacred Heart Hospital, Korea
Poster Board: 63

ID: 118308
Estimation of Pressure Force by Fingertip Color Change and Measurement of Capillary Refill Time Using a Smart Phone
Chiho Miyazawa{1}, Masayoshi Shinozaki{3}, Daiki Saito{2}, Taka-Aki Nakada{2}, Yukihiro Nomura{1}, Toshiya Nakaguchi{1}
{1}Chiba University, Japan; {2}Chiba University Graduate School of Medicine, Japan; {3}National Institute of Advanced Industrial Science and Technology, Japan
Poster Board: 64

ID: 118312
A Proposed Head Rotation Method for Accurate Digitization of EEG Electrode Positions by Electromagnetic Tracking System
Naotsugu Kaneko{2}, Moeka Yokoyama{1}, Kimitaka Nakazawa{2}, Hikaru Yokoyama{3}
{1}Juntendo University, Japan; {2}The University of Tokyo, Japan; {3}Tokyo University of Agriculture and Technology, Japan
Poster Board: 65

ID: 118316
A Light-Weight Semi-Supervised Denoising in Medical Ultrasound Images with Capsule Network and GAN
Anparasy Sivaanpu{3}, Kumaradevan Punithakumar{3}, Rui Zheng{2}, Dean Ta{1}, Edmond Lou{3}, Lawrence Le{3}
{1}Fudan University, China; {2}Shanghai Tech University, China; {3}University of Alberta, Canada
Poster Board: 66
ID: 118317

**Prediction of Polygenic Risk Scores Using fMRI Data**

Kodanda Rama Durga Polluri, Anees Abrol, Mahtfuzur Rahman, Vince Calhoun

Tri-Institutional Center for Translational Research in Neuroimaging and Data Science (TReNDS), United States

Poster Board: 67

ID: 118320

**Unsupervised Abnormal Detection for COVID-19 Screening Using Autoencoder on Point-of-Care Ultrasound**

Tzu-Hao Liu{2}, Liang-Chuan Lai{2}, Tzu-Pin Lu{2}, Mong-Hsun Tsai{2}, Eric Chuang{2}, Hsiang-Han Chen{1}

{1}National Taiwan Normal University, Taiwan; {2}National Taiwan University, Taiwan

Poster Board: 68

ID: 118323

**Deep Learning Framework for Automated Detection of Spread Through Air Spaces Using Digital Pathologic Images**

Yu-Qian Yin{3}, De-Xiang Ou{3}, Chao-Wen Lu{5}, Li-Wei Chen{3}, Wen-Yao Lee{2}, Hsiang-Wei Hu{4}, Jen-Hao Chuang{4}, Mong-Wei Lin{4}, Ling-Ying Chiu{1}, Jin-Shing Chen{4}, Chung-Ming Chen{3}, Min-Shu Hsieh{4}

{1}Chung Shan Medical University, Taiwan; {2}Fu Jen Catholic University Hospital, Taiwan; {3}National Taiwan University, Taiwan; {4}National Taiwan University Hospital, Taiwan; {5}National Taiwan University, China; {4}National Taiwan University Hospital, Taiwan

Poster Board: 69

ID: 118324

**Diagnostic Support Technology for Clostridioides Difficile Infection Using SEM Fecal Images**

Shuhei Fujii{2}, Akio Nagasaka{2}, Yasuki Kakishita{2}, Hideharu Hattori{1}, Akiko Hisada{2}, Erino Matsumoto{2}, Sara Bellali{3}, Omar Zmerli{3}, Jacques Bou Khalil{3}

{1}Hitachi High-Tech Corporation, Japan; {2}Hitachi, Ltd., Japan; {3}Institut Hospitalo-Universitaire Méditerranée-Infection, France

Poster Board: 70

ID: 118325

**Microscopy Imaging Methods for Nucleolar Segmentation in Unstained Histopathological Sections**

Lizhi Hu{1}, Yuichi Sugawara{1}, Masanobu Takahashi{1}, Masayuki Nakano{2}

{1}Shibaura Institute of Technology, Japan; {2}Tokyo Central Pathology Laboratory, Japan

Poster Board: 71

ID: 118330

**Quantitative Analysis of MRI Texture Similarities Between Primary Tumor and Local Recurrence in Nasopharyngeal Carcinoma**

Matthew Lun Wong{1}, Yuet Tin Chan{1}, Ann King{1}, Qiyong Ai{2}

{1}The Chinese University of Hong Kong, Hong Kong; {2}The Hong Kong Polytechnic University, Hong Kong

Poster Board: 72
ID: 118348
**Segmentation of Coronary Artery Calcification in OCT: A Two-Stage Deep Learning Approach Based on Attention Mechanism**
Pin-Yu Yeh{1}, Wei-Chieh Huang{1}, Hsin-I Teng{1}, Tse-Min Lu{2}, Chung-Ming Chen{1}
{1}National Taiwan University, Taiwan; {2}Taipei Veterans General Hospital, Taiwan
Poster Board: 73

ID: 118350
**A Multi-Level Combined Approach of Graph Attention Network for Classifying Structural Neuroimaging with Dementia**
Yunho Kim, Narae Kim, Bumhee Park
Ajou University, Korea
Poster Board: 74

ID: 118352
**Evaluation of the Depth of Invasion of Esophageal Cancer Using Deep Learning**
Toru Akaza{1}, Shingo Sakashita{2}, Genichiro Ishii{2}, Toshiyuki Tanaka{1}
{1}Keio University, Japan; {2}National Cancer Center, Japan
Poster Board: 75

**Thursday Poster Session - Biomedical Signal Processing 1.1**
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 118010
**Importance of Global Information in Speech Recognition for Parkinson's Disease Patients**
Seojin Yoon{1}, Jeonghwan Jeon{1}, Woohyeong Cho{1}, Ryul Kim{2}, Sangmin Lee{1}
{1}Inha University, Korea; {2}Inha University Hospital, Korea
Poster Board: 76

ID: 118063
**Correlation Between Wrist Posture and Myoelectric Moments**
Taichi Watanabe, Takumi Aotani, Ryuta Ozawa
Meiji University, Japan
Poster Board: 77

ID: 118066
**Initial Design of a Low-Cost Digital Stethoscope**
Rachel Huang, Trentin Van Der Ploog, Lane Magness, Jaylinne Rijo, Ryan Farris
Messiah University, United States
Poster Board: 78

ID: 118084
**Towards Precision Quantification of Parkinson’s Symptoms Using an Optical-Based Contactless Leap Motion Controller**
Thomas Li{2}, Stephen Grill{1}, Ramana Vinjamuri{3}
{1}Johns Hopkins University, United States; {2}River Hill High School, United States; {3}University of Maryland, Baltimore County, United States
Poster Board: 79
ID: 118101
**Human Electrocortical Dynamics While Visually Tracking and Stepping Over Obstacles in Virtual Reality**
Yu-Po Cheng, Carter Hartman, Andrew Nordin
Texas A&M University, United States
Poster Board: 80

ID: 118113
**Assessment of Endotracheal Tube Obstruction Using Detrending Algorithms and Fast Fourier Transform**
Ji-Ho Lee, Jinsu An, Ki-Hyeon Park, Hyung-Sik Kim
Konkuk University, Korea
Poster Board: 81

ID: 118117
**Development of a Mass Casualty Triage Application Using the Compensatory Reserve Measurement**
Ryan Ortiz, Saul Vega, Andres Mendoza, Jose Salinas, Victor Convertino, Eric Snider
United States Army Institute of Surgical Research, United States
Poster Board: 82

ID: 118120
**EEG Artifact Removal Using Multi Head Attention Transformer Architecture**
Gowtham Reddy Nimmalapalli, Debashree Guha, Manjunatha Mahadevappa
Indian Institute of Technology Kharagpur, India
Poster Board: 83

ID: 118140
**Continuous Monitoring of Finger Flexor Activity Based on Electrical Impedance Myography**
Pan Xu\(^2\), Junwei Zhou\(^2\), Xinlei Li\(^1\), Ivana Čuljak\(^3\), Wei Wei\(^1\), Xiehua Xue\(^1\), Željka Lučev Vasić\(^3\), Mario Cifrek\(^3\), Yueming Gao\(^2\)
\(^1\)Fujian University of Traditional Chinese Medicine, China; \(^2\)Fuzhou University, China; \(^3\)University of Zagreb, Croatia
Poster Board: 84

ID: 118142
**ECG Derived Respiration Method to Create an Optimal Reconstruction of the Breathing Pattern**
Amaël Mombereau, Ayoub El Ghebouli, Rémi Dubois, Laura Bear
University of Bordeaux, France
Poster Board: 85

ID: 118146
**Characterization of Very Early Components for TMS-EEG Evoked Potentials**
Antonietta Stango\(^1\), Agnese Zazio\(^1\), Guido Barchiesi\(^4\), Giacomo Guidali\(^4\), Delia Lucarelli\(^2\), Eleonora Marcantoni\(^3\), Marta Bortoletto\(^1\)
\(^1\)IRCCS Centro San Giovanni di Dio Fatebenefratelli, Italy; \(^2\)University of Chieti-Pescara, Italy; \(^3\)University of Glasgow, United Kingdom; \(^4\)University of Milano, Italy
Poster Board: 86
ID: 118152
**Determining Thresholds for Manipulator Activation by the Trapezius Muscle: A Case Study from Non-Antagonistic Muscle Pairs**
Zhaolong Wang, Keiichi Zempo, Sandra Puentes
The University of Tsukuba, Japan
Poster Board: 87

ID: 118162
**Task Engagement Prediction Across Task Paradigms Using Dynamic Functional Connectivity Features**
Mohammad Torabi, Georgios Mitsis, Jean-Baptiste Poline
McGill University, Canada
Poster Board: 88

ID: 118165
**Machine-Learning Blood Loss Prediction Model for Tracking Hemorrhage in Swine**
Jose Gonzalez, Saul Vega, Jose Salinas, Eric Snider
United States Army Institute of Surgical Research, United States
Poster Board: 89

ID: 118172
**A Personalized Tonometer for Monitoring Glaucoma**
Madison Hodgson, Ian Sigal, Samuel Dickerson, Piervincenzo Rizzo
University of Pittsburgh, United States
Poster Board: 90

ID: 118178
**Dynamics of Heart Rate and Blood Pressure in Paediatric Critical Illness Using the StemGNN Model**
James Stainer{2}, Samiran Ray{1}, Kevin Tsang{2}
{1}Great Ormond Street Hospital, United Kingdom; {2}University College London, United Kingdom
Poster Board: 91

ID: 118202
**Effects of Stereoscopic 3D Technology on Working Memory: An EEG Study**
Hafeez Ullah Amin{1}, Muhammad Awais{3}, Umar Khan{1}, Mohsin Raza{1}, Naufal Mohamad Saad{2}
{1}Edge Hill University, United Kingdom; {2}Universiti Teknologi PETRONAS, Malaysia; {3}University of East Anglia, United Kingdom
Poster Board: 92

ID: 118209
**Ionic Channels in the Cellular Membrane: A Classic Characterization and, Channelopathies? (Review)**
Katerin Pimentel-Granados, Gerardo Felix-Martinez, Jose-Rafael Godinez-Fernandez
Universidad Autonoma Metropolitana, Mexico
Poster Board: 93
A Preliminary Study: Efficacy of EEG-Based Classification in Cognitive Impairments
Dogeun Park{1}, Young-Gi Ju{1}, Jong-Hee Sohn{2}, Jae-June Lee{2}, Dong-Ok Won{1}
{1}Hallym University, Korea; {2}Hallym University Chuncheon Sacred Heart Hospital, Korea
Poster Board: 94

Multimodal Structural and Dynamic Functional Information Learning ICA Model
Mahshid Fouladivanda, Armin Iraji, Vince Calhoun
Georgia State University (TReNDs), United States
Poster Board: 95

Sex-Specific Neuro-Respiratory Biomarker for Enhanced Respiratory Management
Md Tanvir Ahad, Kimberly Kontson, Kumudhini Hendrix, Christopher Scully, Ramin Bighamian
U.S. Food and Drug Administration, United States
Poster Board: 96

Dynamics of Autonomic Regulation Response to Head-Up Tilt
Jia Hui Ooi{1}, Choon-Hian Goh{2}, Maw Pin Tan{1}, Reza Argha{4}, Hooi Chin Beh{3}, Nigel Lovell{4}, Einly Lim{1}
{1}Universiti Malaya, Malaysia; {2}Universiti Tunku Abdul Rahman, Malaysia; {3}University Malaya Medical Center, Malaysia; {4}University New South Wales, Australia
Poster Board: 97

Heart Rate and Heart Rate Variability in Postural Change in Young Participants Between the Different Groups
Koji Maeda{2}, Tatsuro Fujie{1}, Hideo Nakamura{2}
{1}Morinomiya University of Medical Sciences, Japan; {2}Osaka Electro-Communication University, Japan
Poster Board: 98

Experimental Study of a 3-Layer Depth Encoding PET Detector Inserting Striped Glasses Between Crystal Layers
Qiu-Yu Jin, Tae Woo Kim, Jihoon Kang
Chonnam National University, Korea
Poster Board: 99

Microstate Analysis of EEG Signals Measured During VR Gameplay for Evaluation of VR Games
Tatsuya Yoshii, Shion Nakagawa, Ryota Horie
Shibaura Institute of Technology, Japan
Poster Board: 100
ID: 118321
Unsupervised EEG Feature Learning for Seizure Prediction Based on Convolutional Autoencoder
Yu-Hao Chen, Hsiang-Han Chen
National Taiwan Normal University, Taiwan
Poster Board: 101

ID: 118322
Heart Rate Model Based on Antagonistic Exponential Distributions
Hideo Nakamura
Osaka Electro-Communication University, Japan
Poster Board: 102

ID: 118329
Prototype-Based Classifier for Counterfactual Explanations in Medical Data Analysis
Nobuhito Manome{2}, Shuji Shinohara{1}, Shunji Mitsuyoshi{2}, Ung-II Chung{2}
{1}Tokyo Denki University, Japan; {2}University of Tokyo, Japan
Poster Board: 103

ID: 118344
Evaluation of Predictive and Preparation State in Cognition Using Contingent Negative Variation During Vehicle Driving: A Pilot Study
Kenzo Kawasaki, Keiichiro Inagaki
Chubu University, Japan
Poster Board: 104

ID: 118349
Clustering of Delayed Electrical Responses for Better Classification of OFF Types of Retinal Ganglion Cells
Minju Kim, Hyeonhee Roh, Maesoon Im
Korea Institute of Science and Technology, Korea
Poster Board: 105

ID: 118364
Interpretation of EEG Connectivity in Terms of the Effects of Reward and Punishment on Cognitive Load Using Deep Neural Network
Riho Hitsuyu, Yasuhide Hyodo, Kiyoshi Yoshikawa, Yota Komoriya
Sony Corporation, Japan
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ID: 118385
**Individual Differences in EEG Signals Evoked by Controlled Visual Stimuli of Colors and Forms**
Takaya Tashiro, Ryota Horie
Shibaura Institute of Technology, Japan
Poster Board: 107

ID: 118394
**Non-Contact Heart Rate Measurement Using 60 GHz FMCW Radar**
Ryosuke Shimizu, Yutaka Tomita, Toshiyuki Tanaka
Keio University, Japan
Poster Board: 108

ID: 118402
**Somatosensory Evoked Potentials from the Ears**
Mingfeng Cao{1}, Abhinav Uppal{2}, Min Suk Lee{2}, Prachi Agarwal{1}, Rommani Mondal{2}, Sangjoon An{2}, Akshay Paul{2}, Yuchen Xu{2}, Gert Cauwenberghs{2}, Nitish Thakor{1}
{1}Johns Hopkins University, United States; {2}University of California, San Diego, United States
Poster Board: 109

ID: 118407
**Improving Epileptic Seizure Detection Using ECG-Based Mixed Model with Self-Attention Auto-Encoder and Binary Classifier Validation**
Connie Chang-Chien{2}, Qiu fan Chen{1}, Rikumo Ode{2}, Koichi Fujiwara{2}, Toshitaka Yamakawa{4}, Takatomi Kubo{1}, Miho Miyajima{6}, Satoshi Maesawa{2}, Masaki Iwasaki{3}, Ayatake Fujimoto{5}, Motoki Inaji{6}, Taketoshi Maehara{6}, Manabu Kano{1}
{1}Kyoto University, Japan; {2}Nagoya University, Japan; {3}National Center of Neurology and Psychiatry, Japan; {4}Quadlytics Inc., Japan; {5}Seirei Hamamatsu General Hospital, Japan; {6}Tokyo Medical and Dental University, Japan
Poster Board: 110

ID: 118412
**Closed-Loop Thermoregulatory Sleep Manipulation in Mice**
Diane Iradukunda{2}, Jun Wang{2}, Dillon Huffman{1}, Sridhar Sunderam{2}
{1}Signal Solutions, LLC, United States; {2}University of Kentucky, United States
Poster Board: 111

ID: 118420
**Motor Imagery EEG Signal Generation from Resting-State Signal**
Sion An{1}, Li Shen{2}, Sang Hyun Park{1}
{1}Daegu Gyeongbuk Institute of Science and Technology, Korea; {2}University of Pennsylvania, United States
Poster Board: 112

ID: 118422
**Innovative Strategy for Resolving Trigger Time Discrepancy in ERP Recording**
Ayane Abe{1}, Shunsaku Suzuki{1}, Hiroyuki Ishizuka{2}, Takefumi Hiraki{3}, Norihisa Miki{1}
{1}Keio University, Japan; {2}Osaka University, Japan; {3}Tukuba University, Japan
Poster Board: 113
ID: 118446
**Dynamic Attractor Networks for Pediatric Epilepsy through Chaotic Neural Frameworks**  
Parikshat Sirpal, William Sikora, Hazem Refai  
University of Oklahoma, United States  
Poster Board: 114

ID: 118449
**Comparative Analysis of Clustering Methods with Spiking Activities for Classification of Retinal Ganglion Cell Types**  
Sein Kim, Da Eun Kim, Minju Kim, Maesoon Im  
Korea Institute of Science and Technology, Korea  
Poster Board: 115

ID: 118465
**Simulation Study of Sudomotor Nervous Activity Decoding from Electrodermal Activity**  
Chanki Park, Seungyoon Nam, John Lorenzo Bautista, Hyunsoon Shin  
Electronics and Telecommunications Research Institute, Korea  
Poster Board: 116

ID: 118475
**Estimation of Anaerobic Threshold with Time-Invariant and Time-Varying Transfer Function Models in Cycling**  
Loes Stessens, Jean-Marie Aerts  
KU Leuven, Belgium  
Poster Board: 117

ID: 118489
**Neuronal Bistability Traces Cortical Development in Preterm Infants**  
{1}Aalto University, Finland; {2}IRCCS Istituto Giannina Gaslini, Italy; {3}University of Genoa, Italy; {4}University of Helsinki, Finland  
Poster Board: 118

ID: 118490
**Unraveling Disease Progression in Neuronal Synuclein Diseases**  
Monica Roascio, Pietro Mattioli, Beatrice Orso, Matteo Pardini, Dario Arnaldi, Gabriele Arnulfo  
University of Genoa, Italy  
Poster Board: 119

ID: 118494
**Enhancing QT Segment Detection: Leveraging Concept Drift to Improve the 2D Warping Algorithm**  
Paolo Cachi{2}, Mark Haigney{3}, Soroosh Solhjoo{1}  
{1}F. Edward Hébert School of Medicine, United States; {2}Military Cardiovascular Outcomes Research, United States; {3}Uniformed Science University of the Health Sciences, United States  
Poster Board: 120
ID: 118498
**Brain-Wide Fast-Dynamic Modulations of Human Alpha Rhythm Amplitudes**  
Lei Ding, Han Yuan  
*University of Oklahoma, United States*  
Poster Board: 121

ID: 118504
**Improving the Stimulated Area to Present Phosphenes Using the Electrode Placed Across the Nose**  
Manami Kanamaru{2}, Keita Tanaka{2}, Eiji Kamioka{1}  
{1}*Shibaura Institute of Technology, Japan*; {2}*Tokyo Denki University, Japan*  
Poster Board: 122

ID: 118507
**An Improvement of an Adaptive Filter Used for Heart Rate Variability Analysis**  
Camila Alejandra Maldonado-Veas{2}, Juan Carlos Echeverria{2}, Claudia Lerma{1}  
{1}*Instituto Nacional de Cardiología Ignacio Chávez, Mexico*; {2}*Universidad Autónoma Metropolitana, Mexico*  
Poster Board: 123

ID: 118532
**High-Density Surface EMG Feature Extraction via Random Convolutional Kernel Transform**  
Yonglin Wu{2}, Yao Guo{2}, Xinyu Jiang{3}, Jionghui Liu{1}, Chenyun Dai{2}  
{1}*Fudan University, China*; {2}*Shanghai Jiao Tong University, China*; {3}*The University of Edinburgh, United Kingdom*  
Poster Board: 124

ID: 118554
**Effect of Applied Pressure on Bioimpedance Measurements**  
Zenia Valdiviezo, Ryan Halter  
*Dartmouth College, United States*  
Poster Board: 125

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**Thursday Poster Session - Bionanotechnology and BioMEMS 1.1**  
4:30:00 PM - 6:00:00 PM  
Room: Veracruz Hall

ID: 118049
**Portable Microfluidic Sensor for On-Site Bacteria Detection**  
Ali Doostmohammadi, Yingbo Ma, Arezoo Khalili, Pouya Rezai  
*York University, Canada*  
Poster Board: 126

ID: 118109
**A Novel Biochemical Sensors for Rapid Detection of VOC Biomarkers from Aerosols for a Breathalyzer Platform**  
Pardis Sadeghi, Nian-Xiang Sun  
*Northeastern University, United States*  
Poster Board: 127
ID: 118195
**Stability Improved Cancer Antigen (CA-125) Detection Using Polyethylene Glycol (PEG) in the Microfluidic Shear Flow Condition**
Yudong Wang{1}, Bharath Babu Nunna{2}, Niladri Talukder{1}, Eon Soo Lee{1}
{1}New Jersey Institute of Technology, United States; {2}Weber State University, United States
Poster Board: 128

ID: 118219
**Development of Pancreatic Cell Ink for 3D Bioprinting Based on Pancreatic Islets Using Microgravity**
Chi Bum Ahn, Jae Ho Chung, Hyo Jung Kim, Sung Ho Lee
Korea University, Korea
Poster Board: 129

ID: 118254
**Photonic Crystal Enhanced Fluorescence for Digital Resolution Biosensing**
Yanyu Xiong{1}, Skye Shepherd{1}, Priyash Barya{1}, Srikanth Singamaneni{2}, Andrew Smith{1}, Brian Cunningham{1}
{1}University of Illinois at Urbana- Champaign, United States; {2}Washington University, United States
Poster Board: 130

ID: 118258
**Rapid Near-Patient Impedimetric Sensing Platform for Prostate Cancer Diagnosis**
Parisa Dehghani{3}, Vaithinathan Karthikeyan{3}, Ataollah Tajabadi{3}, Dani Assi{3}, Anthony Catchpole{2}, John Wadsworth{2}, Hing Leung{3}, Vellaisamy Roy{1}
{1}Hong Kong Metropolitan University, Hong Kong; {2}Scottish Trace Element and Micronutrient Diagnostic and Research Laboratory, United Kingdom; {3}University of Glasgow, United Kingdom
Poster Board: 131

ID: 118311
**Nanocellulose-Paper-Based Analytical Devices with MOFs/Heterojunction Structures for Multiplex SERS Detection**
Ruiqi Yong, Wenwen Yuan, Hang Yuan, Pengfei Song
Xi'an Jiaotong-Liverpool University, China
Poster Board: 132

ID: 118347
**Bipolar Microneedle Electrode Array Reduces Current Spreading During Electric Stimulation for High-Resolution Retinal Prosthesis**
Chaesung Kim{2}, Seung-Han Chung{3}, Minju Kim{2}, Hyeonhee Roh{2}, Jin-Yeong Park{1}, Yong-Kweon Kim{3}, Seung-Ki Lee{1}, Jae-Hyoung Park{1}, Maesoon Im{2}
{1}Dankook University, Korea; {2}Korea Institute of Science and Technology, Korea; {3}Seoul National University, Korea
Poster Board: 133
Thursday Poster Session - Biorobotics and Biomechanics 1.1
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 118003
Bone Ingrowth Around an Uncemented Acetabular Component: Influence of Biphasic Stimulus
Ceby Mullakkara Saviour, Sanjay Gupta
Indian Institute of Technology Kharagpur, India
Poster Board: 134

ID: 118004
Towards an Optimal Design of a Functionally Graded Porous Uncemented Acetabular Component
Ceby Mullakkara Saviour, Sanjay Gupta
Indian Institute of Technology Kharagpur, India
Poster Board: 135

ID: 118015
Biomechanical Consequences of Motion-Restricting Lower Extremity Orthoses
Callan Heise, Ryan Farris
Messiah University, United States
Poster Board: 136

ID: 118088
Comparing the Usability of Robotic Forceps with Different Structures Through a Needle-Handling Task Imitating a Pediatric Surgery
Kota Aono{1}, Kazuya Kawamura{1}, Daisuke Akimitsu{1}, Michito Katayama{1}, Masakazu Murakami{2}, Satoshi Ieiri{2}
{1}Chiba University, Japan; {2}Kagoshima University, Japan
Poster Board: 137

ID: 118118
Development and Evaluation of a Mechanical Automated Tourniquet for Combat Casualty Care
Michael Lopez, Jonathan Marrero Bermudez, David Berard, Saul Vega, Jose Salinas, Eric Snider
United States Army Institute of Surgical Research, United States
Poster Board: 138

ID: 118138
Biomechanical Analysis of Different Lumbar Fusion Plate
Kuo-Chih Su, Chien-Chou Pan, Cheng-Hung Lee
Taichung Veterans General Hospital, Taiwan
Poster Board: 139

ID: 118153
Biomechanical Evaluation of Lumbar Lateral Plate System and Traditional Pedicle Screw Implantation
Kuo-Chih Su, Cheng-Hung Lee
Taichung Veterans General Hospital, Taiwan
Poster Board: 140
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ID: 118304
Extracting Multijoint Angular Acceleration Features in the Gait of Participants with Knee Osteoarthritis
Keisuke Kubota{1}, Nozomi Sugimoto{1}, Toshiaki Tsuji{2}, Naohiko Kanemura{1}
{1}Saitama Prefectural University, Japan; {2}Saitama University, Japan
Poster Board: 141

ID: 118314
The Effect of Visual Deprivation on Motor Coordination During Walking: An Uncontrolled Manifold Approach
Ryuya Yamakawa, Ryoma Kimura, Yusuke Sakaue, Shima Okada, Naruhito Shiozawa
Ritsumeikan University, Japan
Poster Board: 142

ID: 118342
Evaluating Powered Ankle-Foot Orthoses for Achilles Tendon Unloading
Giulia Corniani{2}, Alessandra Margaria{3}, Benito Pugliese{3}, Logan Gaudette{2}, Danilo Demarchi{3}, Luke Mooney{1}, Adam Tenforde{2}, Paolo Bonato{2}
{1}Dephy, Inc., United States; {2}Harvard Medical School, Saphulding Rehabilitation Hospital, United States; {3}Politecnico di Torino, Italy
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ID: 118357
Design of Ankle Joint Stretching System Controlled by the Healthy Side Ankle Joint Movement for Self Rehabilitation
Ryo Sekino{1}, Hideki Toda{1}, Hiroaki Kawamoto{2}
{1}University of Toyama, Japan; {2}University of Tsukuba, Japan
Poster Board: 144

ID: 118361
Usability Verification of Leader Devices in Needle Driving in Pediatric Surgery: A Combination of Viewer and Controller
Michito Katayama{1}, Kazuya Kawamura{1}, Kota Aono{1}, Daisuke Akimitsu{1}, Masakazu Murakami{2}, Satoshi Ieiri{2}
{1}Chiba University, Japan; {2}Kagoshima University, Japan
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ID: 118362
A Study of the Impact of Different Forceps Joints on Needle Driving Efficacy in Virtual Environment
Daisuke Akimitsu{1}, Kazuya Kawamura{1}, Kota Aono{1}, Michito Katayama{1}, Masakazu Murakami{2}, Satoshi Ieiri{2}
{1}Chiba University, Japan; {2}Kagoshima University, Japan
Poster Board: 146
ID: 118363
**Proposal for a Preliminary Impulse Stimulation System Using a Stepper for Bone Strengthening**
Atsushi Kamo, Hiroaki Kawamoto
University of Tsukuba, Japan
Poster Board: 147

**Thursday Poster Session - Cardiopulmonary Systems and Physiology-based Engineering 1.1**
4:30:00 PM - 6:00:00 PM
*Room: Veracruz Hall*

ID: 118022
**Numerical Simulations of Blood Flow in Aortic Models with Intimal Tears in the Context of Aortic Dissection**
Labin Kim, Kyung Eun Lee
Inha University, Korea
Poster Board: 148

ID: 118034
**Intraoperative Assessment of Deep Myocardial Tissue Viability with Single Fiber Based Multispectral System**
Karina Litvinova, B Stegemann, F Leyva
Atlantic Technological University, Ireland
Poster Board: 149

ID: 118094
**Long Term Durability Analysis of a Stylet Driven Lead Design for Deep Septal Implants to Enable Left Bundle Branch Area Pacing**
Wesley Alleman, Hao Liu, Robert Shaw, Keith Victorine, Cody Ledbetter
Abbott, United States
Poster Board: 150

ID: 118158
**Advancements in Hemorrhagic Shock Fluid Resuscitation Testbeds for Trauma Care**
Rachel Gathright, Samantha Eaton, David Berard, Jose Salinas, Eric Snider
United States Army Institute of Surgical Research, United States
Poster Board: 151

ID: 118205
**Simulation of Blood Flow in a Patient-Specific Retina Vascular Network with Cell Suspensions**
Kacper Ostalowski, Jifu Tan
Northern Illinois University, United States
Poster Board: 152
A Synthetic Multi-Modal Variable to Capture Cardiovascular Responses to Acute Mental Stress and Transcutaneous Median Nerve Stimulation
Yuanyuan Zhou{3}, Jesse Parreira{3}, Sina Masoumi Shahrbak{3}, Jesus Antonio Sanchez-Perez{1}, Farhan Rahman{1}, Asim Gazi{2}, Omer Inan{1}, Jin-Oh Hahn{3}
{1}Georgia Institute of Technology, United States; {2}Harvard University, United States; {3}University of Maryland, United States
Poster Board: 153

PDMS-Based Biomimetic Microvasculature on a Chip (BMOC) for Exploring Therapeutic Avenues for Gas Embolism
Mohammad Mahdi Mardanpour, Ayyappasamy Sudalaiyadum Perumal, Dan Nicolau
McGill University, Canada
Poster Board: 154

Developing Explainable Models for Prediction of Vaso-Occlusive Pain Crises in Sickle Cell Disease
Mingjing Chen{2}, Thomas Coates{1}, Michael Khoo{2}
{1}Children’s Hospital Los Angeles, United States; {2}University of Southern California, United States
Poster Board: 155

Mental Fatigue Effect Quantified Using Temporally Accumulated Heart Rate Variability
Tomoya Ikuta, Yasuhide Hyodo, Yota Komoriya
Sony Corporation, Japan
Poster Board: 156

Optimal Management Goals During Cardiopulmonary Bypass to Prevent Cardiac Surgery-Associated Acute Kidney Injury
Takumi Sasaki{1}, Toshiyuki Nakanishi{2}, Koichi Fujiwara{2}, Kazuya Sobue{1}
{1}Nagoya City University, Japan; {2}Nagoya University, Japan
Poster Board: 157

Thursday Poster Session - Computational and Synthetic Biology 1.1
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

Generation of Computational Patient-Specific Models Using Point Cloud Data for Electrophysiology Studies
Josue Nataren Moran
Duke University, United States
Poster Board: 158
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ID: 118135
**Identifying Dominant Omicron Lineages Using Embeddings and Anomaly Detection**
Simone Rancati{2}, Giovanna Nicora{2}, Simone Marini{1}, Marco Salemi{1}, Riccardo Bellazzi{2}
{1}University of Florida, United States; {2}University of Pavia, Italy
Poster Board: 159

ID: 118171
**Patient Stratification Through Mutational Signatures-Based Similarity Network Reveals Clusters of Patients with Different Survival Outcomes**
Caterina Alfano, Lorenzo Farina, Manuela Petti
Sapienza University of Rome, Italy
Poster Board: 160

ID: 118173
**Left Ventricular Computational Model for Investigating Flow Hemodynamics After Laceration of Anterior Mitral Leaflet**
Yousef Alharbi
Prince Sattam Bin Abdulaziz University, Saudi Arabia
Poster Board: 161

ID: 118196
**The Effect of Angiogenesis on Thermal Properties of Tissue**
Shriya Musuku, Satish Kandlikar
Rochester Institute of Technology, United States
Poster Board: 162

ID: 118197
**Modeling of Vasculature Geometry in Perfusion Through Tissue**
Brendan Cappon, Satish Kandlikar
Rochester Institute of Technology, United States
Poster Board: 163

ID: 118215
**A New Method for Patient Stratification Based on Multi-Layer Network Modeling and Molecular Data Integration**
Manuela Petti, Davide Mascolo, Caterina Alfano, Lorenzo Farina
Sapienza University of Rome, Italy
Poster Board: 164

ID: 118298
**Unveiling the Role of Green Tea Polyphenols in TNBC Therapeutics**
Prarthana Chatterjee, Satarupa Banerjee
Vellore Institute of Technology, India
Poster Board: 165
Technical Program – Thursday, July 18th

ID: 118335
**Functional Spiking Recurrent Neural Networks Under Biological Constraints of Neurotransmitter Receptors**
Bin Li, Tianyi Zheng, Kiyoshi Kotani, Kenta Shimba, Yasuhiko Jimbo
The University of Tokyo, Japan
Poster Board: 166

Thursday Poster Session - Neural and Rehabilitation Engineering 1.1
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 118009
**Gut-Derived Bacteria Enters the Brain Following Intracortical Microelectrode Implantation**
George Hoeferlin{1}, Sarah Grabinski{1}, Lindsey Druschel{1}, Jonathan Duncan{1}, Gwendolyn Weagraff{2}, Ana Hernandez-Reynos{3}, Joseph Pancrazio{3}, Hoda Amani Hamedani{1}, H von Recum{1}, Liang-Liang Zhang{1}, JR Capadona{1}
{1}Case Western Reserve University, United States; {2}University of Florida, United States; {3}University of Texas at Dallas, United States
Poster Board: 167

ID: 118016
**A 3D Printing Method for Diamond Neural Electrodes**
Nour Mani, Kate Fox
RMIT University, Australia
Poster Board: 168

ID: 118041
**A Computational Predictive Model of Bionic Array-Directed Gene Electrotransfer (BaDGE) for Neural Applications**
Keng-Yin Lai, Stephen Mow, Mathumathi Manoharan, Lily Pearson, Amr Al Abed, Georg Von Jonquieres, Gary Housley, Nigel Lovell
University of New South Wales, Australia
Poster Board: 169

ID: 118052
**Biomechanical Analysis of Walking Improvements in Incomplete Spinal Cord Injury with Wearable Exoskeleton Gait Training**
Sungwoo Park{2}, Kukhyun Ahn{2}, Anna Lee{1}, Juyoung Yoon{2}, Dong Jin Hyun{2}
{1}Asan Medical Center, Korea; {2}Hyundai Motor Company, Korea
Poster Board: 170

ID: 118060
**Trancranial Direct Current Stimulation in Alzheimer’s Disease**
Anu Aggarwal, Pranay Sen
University of Illinois Urbana Champaign, United States
Poster Board: 171
ID: 118072
**Quantifying Conventional Ankle-Foot Orthoses Fabrication Methods Using Digital Technology**
Connor Matton, Jan Andrysek
*University of Toronto, Canada*
Poster Board: 172

ID: 118079
**Investigating the Efficacy of Interventions to Improve Hand Function, and its Correlation with Corticospinal Tract Malorganization in CP Children**
Anjuman Nahar¹, Sudip Paul¹, Manob Jyoti Saikia²
¹North-Eastern Hill University, India; ²University of North Florida, United States
Poster Board: 173

ID: 118092
**Encoding of Directionality for Sensory Feedback in Neuroprosthetic**
Franklin Leong, Chloé Bernardoni, Solaiman Shokur, Silvestro Micera
*Ecole Polytechnique Fédérale de Lausanne, Switzerland*
Poster Board: 174

ID: 118095
**Measurement of Transcranial Magnetic Stimulation-Induced Electric Fields in Conductively Accurate Rat Head Phantoms**
Wesley Lohr, Mohannad Tashli, Ravi Hadimani
*Virginia Commonwealth University, United States*
Poster Board: 175

ID: 118097
**Opto-Myomatrix: μLED Integrated Microelectrode Arrays for Optogenetic Activation and Electrical Recording in Muscle Tissue**
Jiaao Lu², Jeong Jun Kim³, Muneeb Zia², Danish Baig², Kailash Nagapudi¹, Philip Anschutz², Daniel O'Connor³, Samuel Sober¹, Muhannad Bakir²
¹Emory University, United States; ²Georgia Institute of Technology, United States; ³Johns Hopkins School of Medicine, United States
Poster Board: 176

ID: 118100
**Advancing Transcranial Magnetic Stimulation Coils for Small Animal Research: Utilizing Multi-Magnetic Materials to Enhance Electric Field Focality**
Mohannad Tashli³, Aryan Mhaskar³, George Weistroffer¹, Mark Baron², Ravi Hadimani³
¹Richmond Institute for Veterans Research, United States; ²Richmond Veterans Affairs Medical Center, United States; ³Virginia Commonwealth University, United States
Poster Board: 177

ID: 118110
**Determining Muscle Activation Timing During Exoskeletal-Assisted Walking with an Electrical Stimulation Subsystem**
Sandra Hnat¹, Mac Camardo¹, Marshaun Fitzpatrick¹, Nathan Makowski², Ronald Triolo¹
¹Case Western Reserve University, United States; ²The MetroHealth System, United States
Poster Board: 178
ID: 118111
**The Impact on Gait Speed During Unilateral Hybrid Exoskeletal Assisted Walking for Stroke Survivors**
Sandra Hnat{1}, Marshaun Fitzpatrick{1}, Hailey Heidecker{1}, Hala Osman{1}, Lisa Lombardo{2}, Maura Malenchek{2}, Ronald Triolo{1}, Nathan Makowski{3}
{1}Case Western Reserve University, United States; {2}Louis Stokes Cleveland VA Medical Center, United States; {3}The MetroHealth System, United States
Poster Board: 179

ID: 118121
**Comparison of Flexible ECoG Electrodes on Different Polymer Substrates**
Nayeong Lee, Jae-Won Jang, Sohee Kim
Daegu Gyeongbuk Institute of Science & Technology, Korea
Poster Board: 180

ID: 118125
**Foreign Body Responses to Parylene-C Based Intraneural Mesh Interface**
Byungwook Park, Boil Kim, Han Kyoung Choe, Sohee Kim
Daegu Gyeongbuk Institute of Science, Korea
Poster Board: 181

ID: 118127
**Implementation of Mid-Air Lines Using Laser Plasma**
Konkuk University, Korea
Poster Board: 182

ID: 118131
**Visualization of Motor Unit Modulation Innervating Trunk Muscles in Postural Maintenance in Subacute Stroke Patients**
Hiroki Hanawa, Taku Miyazawa
University of Human Arts and Sciences, Japan
Poster Board: 183

ID: 118145
**Personalized Neurostimulation for Ischemic Lesion Recovery in Rats**
Marta Carè{2}, Mattia Di Florio{3}, Rosaria Greco{1}, Federico Barban{3}, David Guggenmos{4}, Cristina Tassorelli{1}, Michela Chiappalone{3}
{1}IRCCS Mondino Foundation, Italy; {2}IRCCS Ospedale Policlinico San Martino, Italy; {3}University of Genoa, Italy; {4}University of Kansas Medical Center, United States
Poster Board: 184
ID: 118182
*Exploring Intermuscular Coordination in Passive and Active Robot-Assisted Gait Through Intermuscular Coherence Analysis*
Valeria de Seta{1}, Stefania Dalise{2}, Valentina Azzollini{5}, Carmelo Chisari{5}, Silvestro Micera{3}, Fiorenzo Artoni{4}
{1}Ecole Polytechnique Fédérale de Lausanne, Switzerland; {2}Pisa University Hospital, Italy; {3}Scuola Superiore Sant'Anna, Switzerland; {4}University of Genève, Switzerland; {5}University of Pisa, Italy
Poster Board: 185

ID: 118183
*Investigation of Combined Thermal and Electrotactile Cutaneous Stimulation for Multimodal Sensory Feedback*
Jonathan Muheim, Franklin Leong, Bastien Romand, Silvestro Micera, Solaiman Shokur
Ecole Polytechnique Fédérale de Lausanne, Switzerland
Poster Board: 186

ID: 118206
*An LLM-Powered VR-BCI System for Motor Rehabilitation*
Chun-Shu Wei{2}, Yu-Te Wang{1}, Chi-Min Chang{2}, Chin Chang{2}, Yan-Han Chang{2}, Yu-Chiao Chen{2}, Yih-Ning Huang{2}, Jui-Bang Lu{1}, Bo-Shan Wang{2}
{1}Academia Sinica, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan
Poster Board: 187

ID: 118207
*Electric Stimulation Elicits Photoreceptor-Mediated Natural Responses in Only a Subset of OFF Retinal Ganglion Cells for Enhanced Artificial Vision*
Hyeonhee Roh, Minju Kim, Misung Kim, Maesoon Im
Korea Institute of Science and Technology, Korea
Poster Board: 188

ID: 118211
*Limits of Neural Stimulation for Prosthetic Control: Tactile Afferents Cannot Follow High Rates of Electrical Stimulation*
Tom Su, Alwin So, Felix Aplin, Richard Vickery, Ingvars Birznieks
University of New South Wales, Australia
Poster Board: 189

ID: 118212
*Hand Rehabilitation Using Virtual Reality for Degenerative Cervical Myelopathy: A Preliminary Study*
Viprav Bhaskar Raju{3}, Roxanne Deleon{1}, Brian Schmit{2}, Derek Kamper{5}, Mohammad Ghassemi{5}, Aditya Vedantam{4}
{1}Marquette University, United States; {2}Marquette University, United States; {3}Medical College of Wisconsin, United States; {4}Medical College Wisconsin, United States; {5}North Carolina State University, United States
Poster Board: 190
Virtual Wheelchair Control System Using SSVEP for Post-Stroke Rehabilitation
Hamilton Rivera-Flor\textsuperscript{2}, Cristian Guerrero-Mendez\textsuperscript{1}, Denis Delisle-Rodriguez\textsuperscript{3}, Teodiano Bastos\textsuperscript{1}
\textsuperscript{1}Federal University of Espírito Santo, Brazil; \textsuperscript{2}National Training Service (SENA), Colombia; \textsuperscript{3}Santos Dumont, Brazil
Poster Board: 191

Thursday Poster Session - Neural and Rehabilitation Engineering 1.2
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

The Effects of Binaural Beats on the Brain’s Functional Connectivity
Emily Fenton, McKinzie Tucker, Mary Habjanic, Kathryn Lindquist, Brian Sylcott, Chris Mizelle, Sunghan Kim
East Carolina University, United States
Poster Board: 192

Graph Theoretic Analysis of the Human Brain’s Functional Connectivity Alteration Due to Sleep Restriction: Pilot Study
Annabel Hayes, James Watkins, Marwa Antar, Chris Mizelle, Loren Limberis, Sunghan Kim
East Carolina University, U.A.E.; East Carolina University, United States
Poster Board: 193

Effects of Sensorimotor-Integrated (SMI) Wrist/Hand Rehabilitation on Pathway-Specific Corticomuscular Coherence Poststroke
Legeng Lin\textsuperscript{1}, Man-Ting Kuet\textsuperscript{1}, Wanyi Qing\textsuperscript{2}, Hengtian Zhao\textsuperscript{1}, Fuqiang Ye\textsuperscript{1}, Yanhuan Huang\textsuperscript{1}, Xiaoling Hu\textsuperscript{1}
\textsuperscript{1}The Hong Kong Polytechnic University, China; \textsuperscript{2}The Hong Kong Polytechnic University
Poster Board: 194

Safety and Quality Evaluation of Concurrent Transcranial Electrical Stimulation with fMRI
Beni Mulyana, Yuan Yang
University of Illinois at Urbana Champaign, United States
Poster Board: 195

Rest EEG for Bypassing Motor Imagery Model Re-Training
Mohammad Naser, Sarah Fernandes, Sylvia Bhattacharya
Kennesaw State University, United States
Poster Board: 196
Technical Program – Thursday, July 18th

ID: 118277
**Novel PET-Metal Fiber-Based Yarn Memristor as a Synaptic Device**
Wesley Lohr{4}, Sanaya Bothra{3}, Nandan Kumar{2}, Satish Singh{1}, Suraj Khanna{1}, Ravi Hadimani{4}
{1}CSIR-National Physical Laboratory, India; {2}High Performance Textiles Private Ltd, India; {3}Maggie Walker, United States; {4}Virginia Commonwealth University, United States
Poster Board: 197

ID: 118279
**Encoding of Sinusoidally Modulated Pulsatile Electric Stimuli into Demyelinated Auditory Nerve Fiber Models**
Yuta Tezuka, Hiroyuki Mino
Kanto Gakuin University, Japan
Poster Board: 198

ID: 118280
**Pulsatile Versus Sinusoidal Electric Stimuli: Regulating a Balance Between Dopaminergic Neuron Activities in Striatum Neural Network Models**
Takeru Suzuki{2}, Hiroyuki Mino{2}, Dominique Durand{1}
{1}Case Western Reserve University, United States; {2}Kanto Gakuin University, Japan
Poster Board: 199

ID: 118281
**Neurorehabilitation via Enhancing Cognitive Strength**
Aniruth Senthilkumar, Lauren Manusos, Waralyz Hernandez, Alice Yen, Vincent Chen
Loyola University Chicago, United States
Poster Board: 200

ID: 118288
**Direct Modulation Index for Evaluating Phase Amplitude Coupling Generated by Gating Reward-Related Spiking Activities in a Cortico-Nucleus Accumbens-Ventral Tegmental Area Neural Network Model**
Miku Tajima, Sumie Tomehata, Hiroyuki Mino
Kanto Gakuin University, Japan
Poster Board: 201

ID: 118293
**Neuroprosthesis for Rats: Active Signal Recording and Stimulation of Rat Sciatic Nerve**
Hiroaki Sugimoto, Ryuhei Miki, Takashi Ota, Norihisa Miki
Keio University, Japan
Poster Board: 202

ID: 118313
**Tumor Progression and Autonomic Nervous System Connectivity**
Grant McCallum{1}, Jay Shiralkar{1}, Taylor Moon{1}, Tiana Anthony{1}, Efstathios Karathanasis{1}, Jennifer Yu{2}, Dominique Durand{1}
{1}Case Western Reserve University, United States; {2}Cleveland Clinic, United States
Poster Board: 203
Technical Program – Thursday, July 18th

ID: 118331
Spatial Auditory Soundscapes for Developing Digital Neurobiomarkers or Cognitive Interventions in Early-Onset Dementia Based on EEG and fNIRS Machine-Learning Analysis
Simon Kojima{2}, Reiko Shiba{4}, Yota Morimoto{5}, Kiyoshi Furukawa{4}, Shin’ichiro Kanoh{3}, Tomasz Komendzinski{1}, Mihoko Otake-Matsuura{2}, Tomasz Rutkowski{2}
{1}Nicolaus Copernicus University, Poland; {2}RIKEN Center for Advanced Intelligence Project (AIP), Japan; {3}Shibaura Institute of Technology, Japan; {4}Tokyo University of The Arts, Japan; {5}Waseda University, Japan
Poster Board: 204

ID: 118332
Increased Activity of the Vestigial Auriculomotor System During Effortful Listening
Andreas Schroeer{1}, Farah Corona-Strauss{1}, Ronny Hannemann{3}, Steven Hackley{2}, Daniel Strauss{1}
{1}Saarland University, Germany; {2}University of Missouri, United States; {3}WSAudiology, Germany
Poster Board: 205

ID: 118333
Objective Correlates of Binaural Interaction in the Frequency Domain Using Constant Rate Click Trains
Andreas Schroeer, Simon Busch, Farah Corona-Strauss, Daniel Strauss
Saarland University, United States; Saarland University, Germany
Poster Board: 206

ID: 118337
Verification of Effects of Pseudo-Eccentric Contraction Training with Ankle Rehabilitation Device
Yusuke Imanishi, Akihito Ito, Nobutaka Tsujiuchi, Tomoya Mukai
Doshisha University, Japan
Poster Board: 207

ID: 118339
Detection of Compensatory Movements in Robot-Assisted Upper Limb Rehabilitation Through Pose Estimation and Machine Learning
{1}Barrett Technology, LLC., United States; {2}Harvard Medical School, Spaulding Rehabilitation Hospital, United States; {3}Politecnico di Torino, Italy
Poster Board: 208

ID: 118341
LSTM Neural Networks for Decoding Orofacial Behavioral States from Local Field Potential of Primary Motor Cortex During Feeding Behavior
Harpita Pandian{1}, Kazutaka Takahashi{2}
{1}CPS Global School, India; {2}University of Missouri, United States
Poster Board: 209
ID: 118346
**Predicting Stimulation-Evoked Changes in Rodent Bladder Function Using Machine Learning**
Ryan Koh, José Zariffa, Paul Yoo  
*University of Toronto, Canada*
Poster Board: 210

ID: 118360
**Single-Trial Plug-and-Play P300-Based BCI: Paving the Way for Real-World Use with Task-Relevant Stimuli**
Jongsu Kim, Sung-Phil Kim  
*Ulsan National Institute of Science and Technology, Korea*
Poster Board: 211

ID: 118370
**A Quadratic Programming Approach for the Exact Resolution of Superpositions of Action Potentials**
Roberto Zanotti, Francesco Negro  
*University of Brescia, Italy*
Poster Board: 212

ID: 118372
**Simulation Study on Safety of Magnets in Cochlear Implants for Magnetic Resonance Imaging**
Jaehyeong Lee{1}, Sowon Shin{2}, Gwangjin Choi{2}, Junewoo Hyun{2}, Sangwoo Kim{2}, Kyou Sik Min{2}, Joonsoo Jeong{1}  
{1}Pusan National University, Korea; {2}Todoc Corporation, Korea
Poster Board: 213

ID: 118384
**Designing Robust Myoelectric Control by Considering Two-Dimensional Arm Positions**
Trevor Overton, Zubaidah Al-Mashhadani, Raelyn Tobillo, Jason Whitson, Mohsen Rakhshan  
*University of Central Florida, United States*
Poster Board: 214

ID: 118388
**Respiratory Modulation of Surface Electromyographic Data from the Suprahyoid and Infrahyoid Muscles**
Afua Appiah, Emer Doheny  
*University College Dublin, Ireland*
Poster Board: 215
Thursday Poster Session - Technology for Women and Children’s Health/Equity and Access for Well-health 1.1
4:30:00 PM - 6:00:00 PM
Room: Veracruz Hall

ID: 118037
**Machine Learning-Based Prediction of Substance Use in Adolescents: Derivation and Validation in Multinational Datasets in South Korea, USA, and Norway**
Selin Woo, Dong Keon Yon
Kyung Hee University Medical Center, Korea
Poster Board: 216

ID: 118114
**Simple Transfer Learning for Community-Based Rare Disease Surveillance: A Case Study of Image-Based Acute Flaccid Paralyis Surveillance for Under 15 Children in Ethiopia**
Kokeb Dese[2], Se-Woon Choe[3], Filimona Bisrat[1], Tenager Tadesse[1], Jude Kong[4], Gelan Ayana[2]
{1}CGPP-Ethiopia, Ethiopia; {2}Jimma University, Ethiopia; {3}Kumoh National Institute of Technology, Korea; {4}University of Toronto, Canada
Poster Board: 217

ID: 118166
**An EEG-Based Musical “Superpower” for Reducing Social Isolation and Improving Emotional Well-Being in Children with Spike-Wave Seizures**
Alan Paris[1], Azadeh Vosoughi[2], Mikayla Peña[2], Ryan Baumgartner[2]
{1}NeuroLogic Lab, United States; {2}University of Central Florida, United States
Poster Board: 218

ID: 118181
**Selection Algorithms Identify Pre-Pregnancy Features Associated with Preeclampsia Onset and Birthweight Percentile**
Enerson Poon[1], Bryn Loftness[1], Nick Cheney[1], Carole McBride[2], Ira Bernstein[2]
{1}University of Vermont, United States; {2}University of Vermont Medical Center, United States
Poster Board: 219

ID: 118203
**Feature Selection to Mitigate Machine Learning Based Ethnic Disparities in Diagnosing Asymptomatic Bacterial Vaginosis**
Cameron Celeste, Ivana Parker
University of Florida, United States
Poster Board: 220

ID: 118286
**Boosting Gestational Diabetes Mellitus Prediction Performance by Imputation**
Leyao Ma[1], Lin Yang[1], Yaxin Wang[2], Jie Hao[1], Liangkun Ma[2], Ziyang Wang[1], Yin Sun[2], Jiao Li[1]
{1}Chinese Academy of Medical Science & Peking Union Medical College, China; {2}Peking Union Medical College Hospital, China
Poster Board: 221
One-Step Preparation of Immunoliposomes
Md. Mofizur Rahman, Yuan Wan
Binghamton University, United States
Poster Board: 222

Temporal Variability in Stride Kinematics During the Application of TENS: A Machine Learning Analysis
Sajjad Daneshgar{2}, Fabian Hoitz{1}, Roger Enoka{2}
{1}University of Calgary, Canada; {2}University of Colorado Boulder, United States
Poster Board: 223

Evaluation of Somatic Pain and Physiological Effects from the Time Compression Effect Induced by a Virtual Reality Environment
Ryosuke Kasai, Ryosuke Uchibayashi, Yuki Ando, Tetsuya Shimamine, Nae Hinata
Tokyo University of Technology, Japan
Poster Board: 224

Sampling the Gut Microbiota Using an Ingestible Device
Gafaru Moro{1}, Nikolaj Kofoed Mandsberg{1}, Sandra Andersen{2}, Mahdi Ghavami{1}, Anja Boisen{1}
{1}Technical University of Denmark, Denmark; {2}University of Copenhagen, Denmark
Poster Board: 225

Deep Learning-Combined SERS Biosensing with Spontaneous Uniformly Distributed MoS2-Assisted Multi-Stacked Gold Nanoparticles
Wansun Kim, Hyejin Lee, Jae-Ho Shin, Sang Woong Moon, Samjin Choi
Kyung Hee University, Korea
Poster Board: 226

Multistage Transfer Learning for Skin Cancer Squamous Cell Carcinoma Histopathology Image Classification
Gelan Ayana, Eonjin Lee, So-Yun Park, Se-Woon Choe
Kumoh National Institute of Technology, Korea
Poster Board: 227
ID: 118080
**Prediction Model of Ventilatory Difficulty in Pediatric Patients Undergoing General Anesthesia with a Supraglottic Airway Device**
Toshiyuki Nakanishi{1}, Koichi Fujiwara{2}, Yuji Kamimura{1}, Kazuya Sobue{1}
{1}Nagoya City University, Japan; {2}Nagoya University, Japan
Poster Board: 228

ID: 118083
**Establishing an Ingestible Ultralong Health Monitoring Platform**
James McRae, Eleanor Jaffe, Steven Herrera, Ziliang Kang, Adam Gierlach, Andrew Pettinari, Niora Fabian, Alison Hayward, Giovanni Traverso
Massachusetts Institute of Technology, United States
Poster Board: 229

ID: 118085
**Machine Learning-Based Automated Classification of Vestibular Disorders**
Cecilia Andrea Callejas Pastor{1}, Dongheon Lee{1}, Yunseo Ku{1}, Hyun Tae Ryu{2}, Jung Sook Joo{2}, Myung-Whan Suh{2}
{1}Chungnam National University, Korea; {2}Seoul National University Hospital, Korea
Poster Board: 230

ID: 118105
**Scoliosis Surgery: Surprising Impact on Squatting, Minimal Effect on Walking**
Prithwi Raj Das{1}, Scott Russo{2}, Yunju Lee{1}
{1}Grand Valley State University, United States; {2}Orthopaedic Associates of Michigan, United States
Poster Board: 231

ID: 118122
**A Highly-Tunable GelMA Based Tissue Phantom Using 3D Bio-Printing for Microwave Applications in Medicine**
Yuchen Gu, Daniel van der Weide
University of Wisconsin-Madison, United States
Poster Board: 232

ID: 118124
**Usability Evaluation of Improved Handle Shapes in a Forceps-Type Mini Positron-Emission-Tomography**
Hiroto Hayashi{1}, Kazuya Kawamura{1}, Shigeki Ito{2}, Miwako Takahashi{3}, Taiga Yamaya{3}
{1}Chiba University, Japan; {2}Mirai-Imaging Corporation, Japan; {3}National Institutes for Quantum Science and Technology, Japan
Poster Board: 233

ID: 118128
**A New Method for Monitoring Thermal Deformation During RFA**
Xinyi Wang{1}, Shiqing Zhao{1}, Cuixia Dai{2}, Aili Zhang{1}
{1}Shanghai Jiaotong University, China; {2}Shanghai Institute of Technology, China
Poster Board: 234
ID: 118139
**Effective Heating Mechanism of Magnetic Hyperthermia with Pulse Magnetic Fields for Cancer Treatment**
Akihiro Kuwahata{2}, Yuui Adachi{2}, Eiji Nakamura{1}, Shin Yabukami{2}
{1}High Energy Accelerator Research Organization (KEK), Japan; {2}Tohoku University, Japan
Poster Board: 235

ID: 118147
**Development of a Novel Micro-Differential Scanning Calorimetry System for Clinical Diagnostics**
Nichola Garbett, Alagammal Kaliappan, Gabriela Schneider, Thomas Roussel
University of Louisville, United States
Poster Board: 236

ID: 118151
**Electrical Conductivity Measurement of Conductive Gels for Radiofrequency Treatment in Cosmetic Dermatology**
Yonghyeon Yun{1}, Hangsik Shin{2}
{1}Daelim University College, Korea; {2}University of Ulsan College of Medicine, Korea
Poster Board: 237

ID: 118155
**Design of Ultrasound-Guided Automated Junctional Tourniquets**
James Collier, David Berard, Theodore Winter, Michael Lopez, Austin Ruiz, Jose Salinas, Eric Snider, Sofia Hernandez Torres
United States Army Institute of Surgical Research, United States
Poster Board: 238

ID: 118156
**Automated Hemorrhagic Shock Resuscitation by an Adaptive Resuscitation Controller in a Large Animal Model**
David Berard, Saul Vega, Sophia Salazar, Evan Ross, Eric Snider
United States Army Institute of Surgical Research, United States
Poster Board: 239

ID: 118170
**Survival Prediction Models Empowered by a Novel Drug Resistance-Associated MicroRNA Signature for Aiding Clinical Diagnosis and Treatment**
Fang-Yu Ko, Shinn-Ying Ho
National Yang Ming Chiao Tung University, Taiwan
Poster Board: 240

ID: 118174
**Efficacy of Photodynamic Therapy with a Novel LED System on Cervical Cancer Cells**
Eonjin Lee, So-Yun Park, Gelan Ayana, Se-Woon Choe
Kumoh National Institute of Technology, Korea
Poster Board: 241
ID: 118175

**Understanding of Lung Lymph Node Behavior and its Impact on EBUS-TBNA Diagnostic Yield**

Lyne Mkoh{2}, Steven Bicknell{1}, Robin Sayer{1}, Sandy Cochran{2}, Emma Henderson{3}

{1}NHS Greater Glasgow and Clyde, United Kingdom; {2}University of Glasgow, United Kingdom; {3}University of Strathclyde, United Kingdom

Poster Board: 242

ID: 118176

**Evaluation of Photothermal and Photodynamic Therapy Effects of Nanocomposites via Fluorescence Microscopy Imaging**

So-Yun Park, Eonjin Lee, Gelan Ayana, Se-Woon Choe

Kumoh National Institute of Technology, Korea

Poster Board: 243

ID: 118224

**Design and Characterization of a Clinical AMF System for Uniform Heating of Prosthetic Knee Implants**

Varun Sadaphal{3}, Bibin Prasad{3}, Jared Smothermon{1}, Kevin McCoy{1}, Jeff Garret{2}, John Tepper{3}, Rajiv Chopra{3}

{1}Aava Technologies, United States; {2}Cobalt Product Solutions, United States; {3}Solenic Medical, United States

Poster Board: 244

ID: 118241

**Customized 3D-Printed Prototype Mold for Potential HDR Brachytherapy in Facial Non-Melanoma Skin Cancer**

Héctor Quevedo-Linares, Lizeth Vega-Medina

Universidad El Bosque, Colombia

Poster Board: 245

ID: 118244

**Investigating the Genesis and Treatment of Decompression Sickness in Microscale Hyperbaric Systems**

Karine Baassiri, Dan Nicolau

McGill University, Canada

Poster Board: 246

**Thursday Poster Session - Wearable Biomedical Sensors and Systems 1.1**

4:30:00 PM - 6:00:00 PM

Room: Veracruz Hall

ID: 118035

**Improving Metabolic Workload Estimation Accuracy for Planning and Analyzing Exploration Traverses**

Kyoung Jae Kim{2}, Bradley Hoffman{2}, Patrick Estep{1}, Karina Marshall-Goebel{3}, Daniel Buckland{3}

{1}GeoControl Systems, United States; {2}KBR, United States; {3}NASA, United States

Poster Board: 247
Technical Program – Thursday, July 18th

ID: 118036
**A Non-Invasive AI-Supported System for Continuous Untethered Heart Rhythm Monitoring and Automated On-Chip Arrhythmia Detection**
Shanliang Deng{3}, Bram den Ouden{3}, Tim De Coster{2}, CI Bart{2}, WH Bax{2}, René Poelma{1}, Antoine de Vries{2}, Guo Qi Zhang{1}, Vincent Portero{2}, Daniël Pijnappels{2}
{1}Delft University of Technology, Netherlands; {2}Leiden University Medical Center, Netherlands; {3}Leiden University Medical Center & Delft University of Technology, Netherlands
Poster Board: 248

ID: 118042
**The Novel Bioinformatic Sensor and Algorithm Based on Individual Heart Sounds and Rhythm**
Dong-Bum Kim, Jong-Ha Lee
Keimyung University, Korea
Poster Board: 249

ID: 118053
**Micro-Suction Cup Array for Improved Attachment in Electrocochleography Electrode**
Gakuto Kagawa, Hidetoshi Takahashi
Keio University, Japan
Poster Board: 250

ID: 118055
**Sleep Mask Type Pulse and Respiratory Wave Sensor Using a Highly Sensitive Differential Pressure Sensor Element**
Taisei Kato{1}, Thanh-Vinh Nguyen{2}, Hidetoshi Takahashi{1}
{1}Keio University, Japan; {2}National Institute of Advanced Industrial Science and Technology (AIST), Japan
Poster Board: 251

ID: 118068
**Assessing the Reliability of the Apple Watch for Monitoring Mental Fatigue in Students During Gaming Activities**
Hamin Park{2}, Aerin Park{1}
{1}Human in Motion Robotics, Canada; {2}Pacific Academy, Canada
Poster Board: 252

ID: 118069
**Development and Pilot Testing of a Wearable to Monitor Tripping in Children with Orthopedic Disabilities**
Warren Smith{1}, Anita Bagley{2}, Douglas Thomas{1}, Zahra Najafi{1}
{1}Sacramento State University at Sacramento, United States; {2}Shriners Children’s North California, United States
Poster Board: 253

ID: 118073
**Flexible Interconnects for Wearable Biomedical Systems**
Prateeti Ugale, Amanda Mills
North Carolina State University, United States
Poster Board: 254
ID: 118075
**A Low-Cost Wearable Monitor for Panic Attack Avoidance**
Laura Frederick, Reese Johnston, Shekinah Ellis, Hailey Levan, Ryan Farris
Messiah University, United States
Poster Board: 255

ID: 118076
**WASP: Wearable Analytical Skin Probe**
Anjali Devi Sivakumar, Ruchi Sharma, Chandrakalavathi Thota, Xudong Fan
University of Michigan, United States
Poster Board: 256

ID: 118078
**Miniaturized Full Hand Kinematic Measurement System for Hand Movement Restoration in Hemiparetic Patients**
Pakhil Singh, Varadhan SKM
Indian Institute of Technology Madras, India
Poster Board: 257

ID: 118093
**Assessment of Fitbit Sense Accuracy in Heart Rate Estimation**
Pierluigi Reali{1}, Marta Carrara{1}, Matteo De Tommaso{2}, Rossana Actis Grosso{2}, Anna Maria Bianchi{1}, Stefania Coelli{1}
{1}Politecnico di Milano, Italy; {2}Università degli Studi di Milano-Bicocca, Italy
Poster Board: 258

ID: 118102
**Wearable DnaNudge-Based Nutrition Product Recommendation System Based on Hypertension Risk**
Dharani Jade{2}, Yun Qin{1}, Tsz-Kin Hon{1}, Maria Karvela{1}, Christofer Toumazou{2}
{1}DnaNudge Ltd, United Kingdom; {2}Imperial College London, United Kingdom
Poster Board: 259

ID: 118104
**Assessing the Ocular Impact of Mixed Reality (MR) Glasses on Visual Fatigue in Teenagers**
Marc Montolio Gil{6}, Cristina Rodriguez-Vidal{5}, Ivan Domenech Juan{1}, Estela Liado Carbo{4}, Amanda Perez{5}, Alex Martinez{3}, Xavier Marimon{2}
{1}AMIQ, Spain; {2}Bioengineering Institute of Technology, Universitat Internacional de Catalunya, Spain; {3}Lucatia, Spain; {4}Neurotoc, Spain; {5}PRESBIT. Ophthalmological Institute of Presbyopia, Spain; {6}World Tech Balance, Spain
Poster Board: 260

ID: 118149
**Hardware-Aware Neural Architecture Search for Optimizing EEG Seizure Detection in Closed-Loop Neurostimulator**
Jonathan Larochelle{2}, Peter Woias{2}, Laura Comella{1}
{1}Karlsruhe University of Applied Sciences, Germany; {2}University of Freiburg, Germany
Poster Board: 261
Technical Program – Thursday, July 18th

ID: 118160  
**Miniature Smart Ring for Real-Time, Continuous Blood Pressure Monitoring**  
Junyeong Lee, Hyejun Kim, Seongu Kim, Minjoo Lee, Jeonghyun Kim  
Kwangwoon University, Korea  
Poster Board: 262

ID: 118169  
**Cough Detection Using an Accelerometer and a Double Layer Capacitance Type Bending Angle Sensor**  
Tatsuya Kobayashi, Daisuke Goto, Yusuke Sakaue, Shima Okada, Naruhiro Shiozawa  
Ritsumeikan University, Japan  
Poster Board: 263

ID: 118180  
**First Results on Feasibility Tests of an Electrical Impedance Spectroscopy Device for Cardiac Contractility Assessment**  
Max Haberbusch{1}, Philipp Aigner{1}, Bettina Kronsteiner{1}, Dai Jiang{2}, Attila Kiss{1}, Bruno Podesser{1}, Andreas Demosthenous{2}, F Moscato{1}  
{1}Medical University of Vienna, Austria; {2}University College London, United Kingdom  
Poster Board: 264

ID: 118193  
**Pilot Study to Compare the Subjective Assessment of Sleep Using a Questionnaire with an Objective Approach Based on a Smartwatch**  
Maksym Gaiduk{1}, Natividad Martínez Madrid{2}, Juan Antonio Ortega Ramírez{3}, Ralf Seepold{1}  
{1}Konstanz University of Applied Sciences, Germany; {2}Reutlingen University, Germany;  
{3}University of Seville, Spain  
Poster Board: 265

ID: 118198  
**Continuously Monitoring Lung Recruitment Under PEEP Titration with Near-Field Radio Sensors**  
Aakash Kapoor, Thomas Conroy, Joaquin Araos, Edwin Kan  
Cornell University, United States  
Poster Board: 266

ID: 118199  
**Mapping of Individual Muscle Actuation by Forearm Radio Sensors**  
Upekha Delay, Zijing Zhang, Edwin Kan  
Cornell University, United States  
Poster Board: 267

ID: 118220  
**Evaluation of Proportional Position Control Using a Wearable Ultrasound System**  
Zahra Taghizadeh, Ahmed Bashatah, Afsana Hossein Rima, Abhishek Sanjay Aher, Samuel Acuña, Siddhartha Sikdar  
George Mason University, United States  
Poster Board: 268
Technical Program – Thursday, July 18th

ID: 118222
**IoT Mobile Application for Alzheimer’s Disease Caregivers**
Logan Pasternak{2}, Ameek Chadha{2}, Monica Rubens{2}, Christian Yanez{2}, John Canevari{1}, Sasan Haghani{2}
{1}Novo Nordisk, United States; {2}Rutgers University, United States
Poster Board: 269

ID: 118251
**Forward Reach-to-Grasp Movement Performance with a Powered Elbow Exoskeleton**
Pei-Chun Kao, Yi-Ning Wu, Hannah Allgood, Lian Orifice, Cooper Ferrari, Holly Yanco
University of Massachusetts Lowell, United States
Poster Board: 270

ID: 118264
**Enhancing Gait in Older Adults with a Haptic Feedback System**
Ehsan Sharafian M.{2}, Colby Ellis{2}, Ben Sidaway{1}, Babak Hejrati{2}
{1}Husson University, United States; {2}University of Maine, United States
Poster Board: 271

**Thursday Poster Session - Biomedical and Health Informatics 1.2**
4:30:00 PM - 6:00:00 PM
Room: Verancruz Hall

ID: 118568
**Tube-Load Model as a Digital Twin for Abdominal Aortic Aneurysm Patients**
Donghyeon Kim{4}, Divyesh Narayanan{5}, Shih-Hsien Sung{3}, Hao-Min Cheng{2}, Chen-Huan Chen{2}, Chang-Sei Kim{1}, Ramakrishna Mukkamala{5}, Jin-Oh Hahn{4}
{1}Chonnam National University, Korea; {2}National Yang Ming Chiao Tung University, Taiwan; {3}National Yang-Ming University, Taiwan; {4}University of Maryland, United States; {5}University of Pittsburgh, United States
Poster Board: 272

**Appreciation Dinner (Invitaiton ONLY)**
6:30:00 PM - 8:30:00 PM
Room: Lantana Hall
Innovations in Healthcare Access: a Multidisciplinary Exploration of Chronic Health Challenges Through Biomedical and Health Informatics
8:30:00 AM - 10:00:00 AM
Room: Baja

Chronic health conditions, ranging from neurodegenerative disorders to the complex sequelae of cancer survivorship, impose a significant burden on individuals and healthcare systems worldwide. These persistent health issues require innovative strategies for sustained management, particularly in healthcare access and quality improvement. Our mini-symposium aims to explore into these challenges from the perspective of Biomedical and Health Informatics (BHI). The discussions will be focused in the exploration of how digital health technologies, such as electronic health records, telehealth platforms, and patient data analytics, can be exploited to revolutionize chronic disease management. We will explore how artificial intelligence (AI) and big data analytics can identify patterns in large datasets of patient information, leading to more personalized and efficient healthcare strategies. Our mini-symposium will focus on the intersection of informatics, digital tools, and patient care, to enhance healthcare delivery through remote monitoring, patient engagement, and improved communication between providers and patients. We'll highlight the role of global BHI initiatives in health equity, examining case studies and successful models to discuss universal health coverage and reducing healthcare access disparities. Interdisciplinary experts like data scientists, researchers, healthcare IT professionals, and policy advocates will collaborate on strategies for integrating informatics into chronic healthcare management. By focusing on the democratization of health informatics and its application in chronic health challenges, this mini-symposium aligns with the growing need for innovative, data-driven approaches in healthcare supported by the EMBC across the years. Our agenda: Opening Remarks (5') Short talks (50') -Harnessing AI and Big Data for personalized chronic disease management. Eugenio Gaeta, senior developer of AI solutions at Life Supporting Technologies. -Early detection of mental health disorders in chronic disease patients. Sergio Guillén, director of the Active Aging Association. -Data models and standardization for cross-domain integration. Giuseppe Fico, president elect of the EAMBES. -Enhancing treatment adherence through the co-creation of tailored solutions. María E. Beltrán, representative of PharmaLedger Association. Speakers Panel Discussion. Chair: María T. Arredondo, Universidad Politécnica de Madrid (20’) Q&A (15’)

Organizer: Estefanía Estévez-Priego
Universidad Politécnica de Madrid, Life Supporting Technologies Group, ETSIT, Spain

Engineering Models and Systems for Health Disparities Research
8:30:00 AM - 10:00:00 AM
Room: Cancun
Coordinated and rhythmic electrical events are critical for normal mechanical function of organs such as the heart, gastrointestinal tract and the uterus. Abnormalities in electrical conduction underpin a variety of debilitating disorders. Approximately 6% of the population suffer from abnormal cardiac rhythm, while disordered electrical events in the gastrointestinal tract have also been associated with gastroparesis and chronic nausea and vomiting. Functional disorders of the uterus (such as endometriosis) have recently been associated with disordered electrical conduction patterns. Novel therapies intended to improve an organ’s mechanical function may induce or exacerbate electrical dysfunction. In the heart, there are well established techniques to diagnose and treat electrical arrhythmias including ablation, and implantable pacemakers. However, in comparison, therapies for the gut and the uterus are less established. This mini-symposium will present novel invasive and non-invasive techniques for in-vivo quantification of the electrical activity in the heart, uterus and the gastrointestinal tract. Novel techniques for modulating the activity and function of these organs will also be discussed. It is anticipated that these novel techniques will eventually lead to new therapies.

Organizers: Leo Cheng\(^3\), Matthew Kay\(^1\), Jack Rogers\(^2\), Recep Avci\(^3\), Yong Wang\(^4\)
\(^1\)George Washington University, United States; \(^2\)University of Alabama at Birmingham, United States; \(^3\)University of Auckland, New Zealand; \(^4\)Washington University in St Louis, United States

Intracortical microstimulation (ICMS) can be used to restore lost sensory function for patients suffering from neurological disease or injury. It is also a valuable experimental tool for the interrogation of neural circuitry. Several factors can influence the spatial and temporal effects of ICMS on surrounding neurons, including the stimulation parameters selected, the tissue response to the implant, and the design of the stimulating electrode. In this mini-symposium, we explore cutting-edge techniques to both understand and control the spatial and temporal effects of ICMS. Speakers will cover a variety of approaches, including computational modeling, spatial transcriptomics, in vivo imaging, and next-generation electrode design. The results presented extend on our current understanding of the effects of electrical stimulation in the brain, with impacts to both the basic science and clinical applications of ICMS.

Organizers: Erin Purcell\(^2\), Takashi Kozai\(^6\), Lan Luan\(^3\), James Weiland\(^5\), Karthik Kumaravelu\(^1\), Kevin Otto\(^4\)
\(^1\)Duke University, United States; \(^2\)Michigan State University, United States; \(^3\)Rice University, United States; \(^4\)University of Florida, United States; \(^5\)University of Michigan, United States; \(^6\)University of Pittsburgh, United States
## AI & Biological Data

**8:30:00 AM - 10:00:00 AM**

*Room: Durango 1*

**Session Chair: Venkata Chaitanya Chirumamilla and Arianna Dagliati**

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<tr>
<th>ID</th>
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<th>Authors</th>
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<tr>
<td>6670</td>
<td>Geno-GCN: A Genome-Specific Graph Convolutional Network for Diabetes Prediction</td>
<td>Kairui Guo{2}, Hua Lin{1}, Mark Grosser{1}, Guangquan Zhang{2}, Jie Lu{2} {1}23 Strands, Australia; {2}University of Technology Sydney, Australia</td>
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<tr>
<td>7870</td>
<td>Drug-Target Interaction Prediction via Deep Multimodal Graph and Structural Learning</td>
<td>Haorun Li{1}, Zhihang Hu{2} {1}Horace Mann School, United States; {2}Shanghai AI Laboratory, China</td>
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<td>7878</td>
<td>Detection of Pre-mRNA Involved in Abnormal Splicing Using Graph Neural Network and Nearest Correlation Method</td>
<td>Yuna Tahashi{2}, Rikumo Ode{2}, Koichi Fujiwara{2}, Jun-Ichi Takeda{1}, Kinji Ohno{2} {1}Gifu University, Japan; {2}Nagoya University, Japan</td>
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<td>7845</td>
<td>Integrated Multi-Omics and Whole Slide Images for Survival Prediction in Glioblastoma Using Multiple Instance Learning and Co-Attention</td>
<td>Jie Hao{2}, Yangrui Liu{3}, Zhiqiang Mo{3}, Xing Liu{1}, Haixia Sun{2}, Jiao Li{2} {1}Beijing Tiantan Hospital, Capital Medical University, China; {2}Institute of Medical Information, Chinese Academy of Medical Sciences &amp; Peking Union Medical College, China; {3}University of Science and Technology of China, China</td>
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<tr>
<td>6326</td>
<td>Automated Immunophenotyping Assessment for Diagnosing Childhood Acute Leukemia Using Set-Transformers</td>
<td>Elpiniki Maria Lygizou{2}, Michael Reiter{2}, Margarita Maurer-Granofszky{1}, Michael Dworzak{1}, Radu Grosu{2} {1}St. Anna Children's Cancer Research Institute, Austria; {2}Technische Universität Wien, Austria</td>
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<td>6235</td>
<td>Integrating Transformers and AutoML for Protein Function Prediction</td>
<td>Gabriel Bianchin de Oliveira, Helio Pedrini, Zanoni Dias Universidade Estadual de Campinas, Brazil</td>
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ID: 7610
**Data-Driven Modeling of Neural Dynamics from EEG to Track Physiological Changes**
Addison Schwamb, Matthew Singh, Rejean Guerriero, Shinung Ching
Washington University in St. Louis, United States

ID: 7689
**Effects of Topology on the Controllability of Brain Connectomes Through Sparsity Promoting Control**
Jethro Lim{1}, Ilias Mitrai{4}, Prodromos Daoutidis{3}, Catherine Stamoulis{2}
{1}Boston Children's Hospital, Harvard University, United States; {2}Harvard Medical School, United States; {3}University of Minnesota Twin Cities, United States; {4}University of Texas at Austin, United States

ID: 6678
**Msdac: A Multi-Source Domain Adversarial Framework for Motion Prediction in Intracortical Brain-Computer Interfaces**
Haozhou Liu{4}, Banghua Yang{4}, Shouliang Guan{2}, Fenqi Rong{4}, Mengao Guo{4}, Ying Fang{3}, Bingyu Liu{1}, Yan Gao{1}, Yong Gu{1}
{1}Institute of Neurosciences, Chinese Academy of Sciences, China; {2}Lingang Laboratory, Institute of Neurosciences, Chinese Academy of Sciences, China; {3}National Center for Nanoscience and Technology, China; {4}Shanghai University, China

ID: 7657
**A Vision Transformer Architecture for Overt Speech Decoding from ECoG Data**
Mohamed Baha Ben Ticha{3}, Xingchen Ran{3}, Philémon Roussel{3}, Florent Bocquelet{3}, Gaël Le Godais{3}, Marc Aubert{3}, Thomas Costecalde{1}, Lucas Struber{1}, Shaomin Zhang{4}, Guillaume Charvet{1}, Philippe Kahane{2}, Stéphan Chabardès{2}, Blaise Yver
{1}CEA-Leti, Grenoble-Alpes University Medical Center, Clinatec, France; {2}Centre Hospitalier Universitaire Grenoble Alpes, France; {3}Université Grenoble Alpes, Inserm, France; {4}Zhejiang University, China

ID: 7796
**Detecting and Eliminating Cardiac Artifact from Endovascular EEG Signals**
Shreya Sreekantham, Nikole Chetty, Douglas Weber
Carnegie Mellon University, United States

ID: 7995
**Toward the TCN-Based Real-Time BCI System for Target Detection**
Eunji Won, Seongyeon Lim, Yeomin Kim, Suh-Yeon Dong
Sookmyung Women's University, Korea
ID: 7198
Investigating the Effects of Gender and Age on the Strength and Focality of Induced Electric Field in Transcranial Magnetic Stimulation
Xiaojing Zhong{2}, Hanjun Jiang{2}, Zhihua Wang{2}, David Jiles{1}
{1}Iowa State University, United States; {2}Tsinghua University, China

ID: 7250
Ground Reaction Forces and Moments in Stroke Survivors: Experimental Versus Anybody Model Predictions
Abdul Aziz Hulleck, Muhammed Abdullah, Farah Hamed, Rateb Katmah, Kinda Khalaf, Marwan El Rich
Khalifa University, U.A.E.

ID: 7367
In Silico Scenario of Bare Metal Stent and Drug-Eluting Stent Performance Modeling in Patient-Specific Arteries: A Comparative Analysis
{1}Rontis Corporation S.A., Switzerland; {2}University of Ioannina, Greece; {3}University of Ioannina, FORTH, Greece; {4}University of Ioannina, FORTH-BRI, Greece; {5}University of Liège, Katholieke Universiteit Leuven, Belgium; {6}University of Patras, University of Ioannina, FORTH-BRI, Greece

ID: 7881
Haptic-Enhanced Mixed Reality for Upper Limb Rehabilitation in Parkinson’s Disease
Nafees Mahmood, Anna Anello, Jin Woo Kim, Kwangtaek Kim, Brittany Smith, Angela Ridgel
Kent State University, United States

ID: 7130
Fusion and Validation Method for Laser Interstitial Thermal Therapy Simulation Model and MRI
Daiyao Xu{1}, Guangzhi Wang{2}
{1}Concordia University, Canada; {2}Tsinghua University, China

ID: 7922
Bayesian Variational Autoencoders for Out-of-Distribution Detection in Physiological Modeling: A Case Study in Fluid Therapy
Elham Estiri, Hossein Mirinejad
Kent State University, United States
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<td>6339</td>
<td>Development of Mobile Application Based on AI for Predicting the Suitable Height of High Heels</td>
<td>Min-Shiuan Lee{1}, Bor-Shyh Lin{2}, Hsin-Lung Wu{1}, Bor-Shing Lin{1}, Si-Huei Lee{3}</td>
<td>{1}National Taipei University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan; {3}Taipei Veterans General Hospital, Taiwan</td>
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<td>Enhancing Health Equity Through Virtual Reality: Mobile Diagnostic Technologies</td>
<td>Chris McCrowe{2}, Azadeh Mirabedini{2}, Toh Yen Pang{2}, Kern Cowell{2}, Francesca Langenberg{3}, Cameron Williams{3}, Stephen Davis{3}, Geoffrey Donnan{3}, Anna Balabanski{3}, Angela Dos Santos{3}, Henry De Aizpurua{1}, Kate Fox{2}</td>
<td>{1}Australian Stroke Alliance, Australia; {2}RMIT University, Australia; {3}Royal Melbourne Hospital, Australia</td>
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<td>6572</td>
<td>Impact of mHealth-Enhanced Prenatal Education and Diet Recording on Gestational Diabetes Mellitus Prevention</td>
<td>Jie Hao{1}, Jiayang Wang{2}, Yin Sun{3}, Jiao Li{1}, Liangkun Ma{3}, Lin Yang{1}</td>
<td>{1}Institute of Medical Information, Chinese Academy of Medical Sciences &amp; Peking Union Medical College, China; {2}National Population Health Data Center, Chinese Academy of Medical Sciences, China; {3}Peking Union Medical College Hospital, China</td>
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<td>6586</td>
<td>Towards Predicting Menstrual Cycle Phases Exploiting Paralinguistic Features</td>
<td>Anika Spiesberger, Adria Mallol-Ragolta, Andreas Triantafyllopoulos, Björn Schuller</td>
<td>Technische Universität München, Germany</td>
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<td>7667</td>
<td>Building Bridges: Strategies for Achieving Gender Inclusivity in Science, Technology, and Innovation</td>
<td>Cristina Lopez Nebreda{3}, M. Fernanda Cabrera-Umpierrez{3}, Paolo Martinez{1}, Yolanda Ursa{2}</td>
<td>{1}FUTOUR, Italy; {2}Inmark, Spain; {3}Universidad Politécnica de Madrid, Spain</td>
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<td>7674</td>
<td>Exploring Random Forest Machine Learning for Fetal Movement Detection Using Abdominal Acceleration and Angular Rate Data</td>
<td>Lucy Spicher{2}, Carrie Bell{1}, Xun Huan{2}, Kathleen Sienko{2}</td>
<td>{1}Michigan Medicine, United States; {2}University of Michigan, United States</td>
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<td>7716</td>
<td>Impact of Multidirectional Vibratory Feedback on Posture Control During Standing and Weight Lifting: A Pilot Study</td>
<td>Hugo M Martins, Matheus G Nogueira, Pedro Parik-Americano, Rafael T Moura, Cristina Pires Camargo, Arturo Forner-Cordero</td>
<td>Universidade de São Paulo, Brazil</td>
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<td>6465</td>
<td>Reducing Visual Dependence of Postural Control in Older Adults with a Vibration Belt Indicating Shifts in Center of Gravity</td>
<td>Chihiro Tsuruta, Jing-Chen Hong, Kazuhiro Yasuda, Qiutung Xu, Hiroyasu Iwata</td>
<td>Waseda University, Japan</td>
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<td>7109</td>
<td>One-Leg Standing: Right and Left Balance COP and EMG Analyses</td>
<td>Leia Bernardi Bagesteiro{1}, Liana Brown{2}</td>
<td>{1}San Francisco State University, United States; {2}Trent University, Canada</td>
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<td>6408</td>
<td>Changes in Pressure of Strap While Walking in a Robotic Gait Training System</td>
<td>Junho Choi, Choonghyun Son</td>
<td>Korea Institute of Science and Technology, Korea</td>
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<td>Exploring the Impact of Continuous Mediolateral Torque Application by Hip Exoskeleton on the Gait Balance of Non-Disabled Individuals</td>
<td>Abbas Alili{1}, Varun Nalam{1}, Joshua Tacca{1}, He Huang{2}</td>
<td>{1}North Carolina State University, United States; {2}North Carolina State University, University of North Carolina at Chapel Hill, United States</td>
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<td>7682</td>
<td>Gait Kinematic Dependent Plantar Stimulation</td>
<td>Christopher Engsberg, Nathaniel Hunt, Mukul Mukherjee</td>
<td>University of Nebraska Omaha, United States</td>
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# Technical Program – Friday, July 19th

## Image Segmentation from Micro to Macro
8:30:00 AM - 10:00:00 AM  
*Room: Yucatan 1*  
Session Chair: Marek Wodzinski and Chiara Coletti

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<td>6145</td>
<td><strong>Towards Cross-Scale Attention and Surface Supervision for Fractured Bone Segmentation in CT</strong></td>
<td>Yu Zhou, Xiahao Zou, Yi Wang</td>
<td>Shenzhen University, China</td>
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<td>6044</td>
<td><strong>Cellular-Resolution Image-Guided Localization in the Primate Brain</strong></td>
<td>Jacob Stefanowicz{3}, John Choi{2}, Katie Wingel{3}, Jarl Haggerty{3}, Adam Charles{1}, Bijan Pesaran{3}</td>
<td>{1}Johns Hopkins University, United States; {2}New York University, United States; {3}University of Pennsylvania, United States</td>
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<td>6329</td>
<td><strong>A Multimodal Transfer Learning Approach for Histopathology and SR-microCT Low-Data Regimes Image Segmentation</strong></td>
<td>Isabella Poles, Eleonora D'Arnese, Mirko Coggi, Federica Buccino, Laura Maria Vergani, Marco Domenico Santambrogio</td>
<td>Politecnico di Milano, Italy</td>
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<td><strong>Small Lesions, Big Impact: An Automated Segmentation Framework for Brain Metastases</strong></td>
<td>Nauman Bashir Bhatti, Ali Sadeghi-Naini</td>
<td>York University, Canada</td>
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<td>6779</td>
<td><strong>Lesion Segmentation in Skin Cancer Images Using Fusion Model via Deep Learning Networks</strong></td>
<td>Ranpreet Kaur{3}, Hamid GholamHosseini{1}, Nada Hegazy{2}, Radwa Taha{2}, Shereen Moataz Afifi{2}</td>
<td>{1}Auckland University of Technology, New Zealand; {2}German University, Egypt; {3}Media Design School, New Zealand</td>
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<td>7541</td>
<td><strong>Bacteria Detection in Optical Endomicroscopy Images Using Synthetic Images</strong></td>
<td>Mehmet Demirel, Bethany Mills, Erin Gaughan, Kevin Dhaliwal, James R. Hopgood</td>
<td>University of Edinburgh, United Kingdom</td>
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Machine Learning for Brain Electrical Signals
8:30:00 AM - 10:00:00 AM
Room: Coronado P&Q
Session Chair: Lei Ding and Luciano Minuzzi

ID: 6063
**Diagnosing Suicidal Ideation from Resting State EEG Data Using a Machine Learning Algorithm**
Mary Sanchez{2}, Maryam Ravan{2}, Gary Hasey{1}, James Reilly{1}, Luciano Minuzzi{1}
{1}McMaster University, Canada; {2}New York Institute of Technology, United States

ID: 6156
**TAU-DI Net: A Multi-Scale Convolutional Network Combining Prob-Sparse Attention for EEG-Based Depression Identification**
Jingdong Zhou{3}, Chongyuan Lian{1}, Xiaoyong Lan{1}, Xue Shi{4}, Lan Wang{3}, Nan Yan{3}, Yi Guo{2}
{1}Shenzhen Bay Laboratory, China; {2}Shenzhen Bay Laboratory, Shenzhen People’s Hospital, China; {3}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {4}Shenzhen People’s Hospital, China

ID: 6347
**Self-Supervised Transformer Model Training for a Sleep-EEG Foundation Model**
Mattson Ogg, William Coon
Johns Hopkins University, Applied Physics Lab, United States

ID: 6437
**Knowledge-Guided EEG Representation Learning**
Aditya Kommineni, Kleanthis Avramidis, Richard Leahy, Shrikanth Narayanan
University of Southern California, United States

ID: 6943
**EEG Emotion Recognition Based on 3D-CTransNet**
Hongtao Luo{2}, Xi Zhao{2}, Ting Zhou{3}, Zhenyu Wang{1}, Tianheng Xu{1}, Honglin Hu{1}
{1}Shanghai Advanced Research Institute, Chinese Academy of Sciences, China; {2}Shanghai University, China; {3}Shanghai University, Shanghai Frontier Innovation Research, China

ID: 6982
**EEG-GMACN: Interpretable EEG Graph Mutual Attention Convolutional Network**
Haili Ye, Stephan Goerttler, Fei He
Coventry University, United Kingdom
Movement Disorders & Rehabilitation  
8:30:00 AM - 10:00:00 AM  
Room: Monterrey 1  
Session Chair: Paolo Bonato and Na Jin Seo

ID: 6267  
**3-Dimensional Vibrotactile Feedback Training Promotes Positive User Experience and Improvement in Reach-to-Grasp Kinematics**  
Rachel Mazorow, Kimberly Bassindale, Robert Scheidt  
Marquette University and the Medical College of Wisconsin, United States

ID: 6395  
**Monitoring and Visualizing Stroke Rehabilitation Progress Using Wearable Sensors**  
Lin Zhou{2}, Torsten Rackoll{1}, Lennard Ekrod{2}, Mircea-Gheorghe Balc{1}, Fabian Klostermann{1}, Bert Amrlich{2}, Alexander Heinrich Nave{1}  
{1}Charité – Universitätsmedizin Berlin, Germany; {2}Hasso Plattner Institute, Universität Potsdam, Germany

ID: 6884  
**Remote Rehabilitation System Capable of Sharing Somatosensory Sensations**  
Kunihiro Ogata{1}, Takuto Nakamura{2}, Shunsuke Kanazawa{1}, Taiki Nobeshima{1}, Hideaki Kuzuoka{2}, Takeshi Kurata{1}  
{1}National Institute of Advanced Industrial Science and Technology, Japan; {2}University of Tokyo, Japan

ID: 7155  
**Wearable Body Sensors Integrated Into a Virtual Reality Environment - A Modality for Automating the Rehabilitation of the Motor Control System**  
Seungmin Jung, Mianzhi Zhou, Ji Ma, Ryan Yang, Steven Cramer, Bruce Dobkin, Lin Yang, Jacob Rosen  
University of California, Los Angeles, United States

ID: 7445  
**Wearable Sensor Configurations for Effective Tremor Assessment in Parkinson’s Disease**  
Shay Reardon{1}, Mustafa Shuqair{1}, Joohi Jimenez-Shahed{2}, Behnaz Ghoraani{1}  
{1}Florida Atlantic University, United States; {2}Icahn School of Medicine at Mount Sinai, United States

ID: 7830  
**Finger Roll-Up Prevention Mechanism for Control of Flexion Rate in a Cable-Driven Grasping Exoskeleton**  
Bryan Blaise, Seth Harson, Maria Paulina Morales, Frank L. Hammond III  
Georgia Institute of Technology, United States
Technical Program – Friday, July 19th

MRI Acquisition
8:30:00 AM - 10:00:00 AM
Room: Yucatan 2
Session Chair: Wilson Silva and Seowung Leem

ID: 7535
**Dual Birdcage Coils to Control Radiation from MRI Systems Operated Without a Faraday Cage**
Ehsan Kazemivalipour, Bastien Guerin, Lawrence Wald
Massachusetts General Hospital, Harvard Medical School, United States

ID: 8101
**A Simulation Study of a Novel Patient-Adjustable MRI Coil for Safe Pediatric Imaging in Children with Cardiac Implantable Electronic Devices (CIEDs)**
Fuchang Jiang{1}, Pia Sanpitak{1}, Bhumi Bhusal{1}, Jasmine Vu{1}, Boris Keil{2}, Laleh Golestanirad{1}
{1}Northwestern University, United States; {2}TH Mittelhessen University of Applied Sciences, Germany

ID: 8103
**Comparative Analysis of RF Heating of Cardiac Implantable Electronic Devices (CIEDs) in Conventional Closed-Bore vs. Vertical Open-Bore MRI Systems**
Jasmine Vu, Bhumi Bhusal, Fuchang Jiang, Laleh Golestanirad
Northwestern University, United States

ID: 8104
**A Resistive Tapered Cylindrical Conductor Can Substantially Reduce RF Heating of Implanted Leads During MRI: A Simulation Study of Helical Wire Structures**
Tayeb Zaidi{3}, Francesca Marturano{2}, Giorgio Bonmassar{1}, Laleh Golestanirad{3}
{1}Harvard Medical School, Massachusetts General Hospital, United States; {2}Massachusetts General Hospital, United States; {3}Northwestern University, United States

ID: 6464
**A Dedicated RF Coil Design for Phosphorus MRS in the Occipital Lobe**
Yufu Zhou{2}, Qingyun Liu{1}, Qing Zhang{1}, Xiaoxiao Wang{1}, Kecheng Yuan{1}, Xueyan Song{1}, Yong Zhang{1}, Bensheng Qiu{1}
{1}University of Science and Technology of China, China; {2}University of Science and Technology of China, Fuqing Medical Co., Ltd., China

ID: 7652
**Numerical Investigation of Different RF Arrays for Magnetic Resonance Guided Focused Ultrasound in Human Head**
Hao Liang, Ming Lu, John Gore, Xinqiang Yan
Vanderbilt University Medical Center, United States
Technical Program – Friday, July 19th

Neural Engineering & Diagnostic Systems
8:30:00 AM - 10:00:00 AM
Room: Fiesta 3&4
Session Chair: Abasalo Daniel and Abbas James

ID: 7148
**A Simplified Method for Long-Term Maintenance of Human Induced Pluripotent Stem-Cell Derived Neural Networks**
Shravan Thaploo, Derrick Lin, Yongcheng Li, Michael Vu, Gregory Brewer, Zoran Nenadic, An Do
University of California, Irvine, United States

ID: 7914
**Pruning Functional Connections in Human Induced Pluripotent Stem Cell Derived Neural Networks**
Shravan Thaploo, Derrick Lin, Gregory Brewer, An Do, Zoran Nenadic
University of California, Irvine, United States

ID: 6164
**Mitigating Nanoparticles-Induced Neuronal Damage Through a Dual Coating Strategy**
Hongyong Zhang, Lingrui Zhao, Sumin Bian, Tian Xu, Mohamad Sawan
Westlake University, China

ID: 6539
**High Performance Single-Particle Tracking Enabled by On-Chip Light-Scattering Enhancement**
Pengcheng Zhang, Tingting Zhan, Guoqiang Gu, Changle Li, Yi Zhang, Hui Yang
Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

ID: 7108
**Quantifying Collaboration Among Nanoparticles for Autonomous Tumor Homing**
Muhammad Ali{2}, Zheng Gong{1}, Yifan Chen{1}
{1}University of Electronic Science and Technology of China, China; {2}University of Waikato, New Zealand

ID: 7117
**Integrating Microfluidics and Deep Learning to Investigate Entomopathogenic Nematode Responses to Host Cues**
Gianluca Manduca{1}, Valeria Zeni{2}, Anita Casadei{2}, Giovanni Benelli{2}, Cesare Stefanini{1}, Donato Romano{1}
{1}Scuola Superiore Sant’Anna, Italy; {2}Università di Pisa, Italy
Neural Signal Processing 3
8:30:00 AM - 10:00:00 AM
Room: Coronado B&C
Session Chair: Paolo Bonato and Mohsen Rakhshan

ID: 7056
Exploring Brain Activity During Awe-Inducing Virtual Reality Experiences: A Multi-Metric EEG Frequency Analysis
Flavia Carbone{2}, Elena Bondi{2}, Yara Massalha{4}, Andrea Anastasi{4}, Adele Ferro{1}, Marta Pizzolante{3}, Giandomenico Schiena{1}, Anna Maria Maddalena Bianchi{2}, Andrea Gaggioli{3}, Maddalena Mazzocut-Mis{4}, Alice Chirico{3}, Paolo Brambilla{4}, El
{1}Fondazione IRCCS Ca’ Granda-Ospedale Maggiore Policlinico, Italy; {2}Politecnico di Milano, Italy; {3}Università Cattolica del Sacro Cuore, Italy; {4}Università degli Studi di Milano, Italy

ID: 7119
Respiratory Signal Extraction from ECG Using a Phase-Amplitude Cross-Frequency Coupling Index
Cesar Augusto Suarez Garcia, Adam Gravitis, Berj Bardakjian
University of Toronto, Canada

ID: 7133
A Generic Technique to Remove a Variety of Electrical Stimulation Artifacts and Detect Stimulus-Embedded Neural Activity
Michael Italiano{2}, Jae-Ik Lee{1}, Tianruo Guo{2}, David Tsai{2}, Shelley Fried{1}, Nigel Lovell{2}, Mohit Naresh Shivdasani{2}
{1}Massachusetts General Hospital, United States; {2}University of New South Wales, Australia

ID: 7231
Using EEG to Measure MMN During Hypnosis: A Preliminary Study
Hélène Devillez{1}, Stephane Bonnet{1}, Hafid Sid-Ahmed{1}, Lilia Langar{2}, Anne Planat-Chrétien{1}, Daniel Anglade{2}, Vincent Auboiroux{1}
{1}CEA-Leti, University of Grenoble Alpes, France; {2}Centre Hospitalier Universitaire Grenoble Alpes, France

ID: 7357
Aligning Transregional Neural Dynamics with Transformer-Based Variational Autoencoders
Shenghui Wu{1}, Xiang Zhang{1}, Yifan Huang{2}, Yiwen Wang{1}
{1}Hong Kong University of Science and Technology, Hong Kong; {2}University of Hong Kong, Hong Kong

ID: 7377
Calibration of a Biophysical Model to Replicate Evoked Compound Action Potentials in the Swine Vagus Nerve
Claudio Verardo{2}, Ciro Zinno{2}, Simone Romeni{1}, Filippo Agnesi{2}, Fabio Bernini{2}, Anar Dushpanova{2}, Valentina Casieri{2}, Vincenzo Lionetti{2}, Silvestro Micera{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Scuola Superiore Sant’Anna, Italy
ID: 7028
**Modelling and Preliminary Clinical Validation of Home-Based Menstrual Neuromodulation Therapy**
Emile Radytė{3}, Laura Stankevičiūtė{3}, Ervinas Bernatavičius{3}, Alexander Anthony Cook{2}, Yvinna Tamiris Rodrigues{1}, Tatiana Camila Lima de Alves Silva{1}, Maria Thereza Micussi{1}, Rodrigo Pegado{1}
{1}Federal University of Rio Grande do Norte, United Kingdom; {2}Samphire Neuroscience, United Kingdom; {3}Samphire Neuroscience Ltd, United Kingdom

ID: 7033
**Astrocytic TRPA1 as a Target in Reversing Social Avoidance by Low-Intensity Focused Ultrasound Stimulation in Mice**
Ganjiang Wei, Ling Wang, Jingnan Zhu, Xiao Wang, Yuran Zang, Jiajia Yang, Chenguang Zheng
Tianjin University, China

ID: 7401
**Modulation of Ultrasonic Stimulation Parameters Towards Evoking Fine Tactile Sensations**
Liuni Qin, Mingyang Dou, Xinpeng Deng, Laixin Huang, Fei Li, Lili Niu, Guanglin Li, Yanjuan Geng
Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

ID: 7413
**Decoding Asymmetric Neural Dynamics in Visual Processing via TMS-Induced Cortical Effective Connectivity**
Edoardo Paolini, Ilaria Siviero, Davide Bonfanti, Gloria Menegaz, Silvia Savazzi, Chiara Mazzi, Silvia Francesca Storti
Università degli Studi di Verona, Italy

ID: 7529
**Enhanced Transient Response of Ultrasound Neuromodulation Mediated by Large Conductance Mechanosensitive Ion Channel**
Xin Li, Guoying Zhang, Chenguang Zheng, Yutao Tian
Tianjin University, China

ID: 7683
**Shape Analysis of Evoked Action Potentials Recorded on the Splenic Nerve**
Juliette Barret{1}, Olivier Meste{1}, Clara Panzolini{2}, Célia Di Martino{2}, Philippe Blancou{2}, Aline Cabasson{1}
{1}Université Côte d'Azur, CNRS, I3S Laboratory, France; {2}Université Côte d'Azur, CNRS, IPMC, France
**Technical Program – Friday, July 19th**

### Signal Processing & Classification Methods for Sleep Studies
8:30:00 AM - 10:00:00 AM  
**Room: Coronado M&N**  
Session Chair: Maksym Gaiduk and Filipe Barata

- **ID: 6348**  
  **Laying the Foundation: Modern Transformers for Gold-Standard Sleep Analysis and Beyond**  
  William Coon, Mattson Ogg  
  Johns Hopkins University, Applied Physics Lab, United States

- **ID: 6553**  
  **Attention on Sleep Stage Specific Characteristics**  
  Iris Huijben, Sebastiaan Overeem, Merel van Gilst, Ruud van Sloun  
  Eindhoven University of Technology, Netherlands

- **ID: 6614**  
  **UMAP for Dimensionality Reduction in Sleep Stage Classification Using EEG Data**  
  Yangfan Deng, Hamad Albidah, Haoliang Cheng, Ahmed Dallal, Jijun Yin, Zhi-Hong Mao  
  University of Pittsburgh, United States

- **ID: 6941**  
  **Sleep Apnea Detection Using Oxygen Saturation During Nocturnal Sleep**  
  Nobuhiro Taniguchi, Hiroshi Kawaguchi, Tatsuya Nagano, Shintaro Izumi  
  Kobe University, Japan

### Soft, Flexible, & Implantable Sensing
8:30:00 AM - 10:00:00 AM  
**Room: Fiesta 7&8**  
Session Chair: Ulkuhan Guler and Foram Madiyar

- **ID: 6692**  
  **Soft Variable Resistance Material for Pressure Sensing Platform**  
  Sooyoung Kim{1}, Tushar Sakorikar{1}, He Huang{2}, Michael Dickey{1}, Ming Liu{2}  
  {1}North Carolina State University, United States; {2}North Carolina State University, University of North Carolina at Chapel Hill, United States
ID: 7034
Sensorizing Objects with Soft and Flexible Sensors Based on Laser-Induced Graphene
Giovanna De Luca, Anna Chiara Bressi, Martina Maselli, Francesco Greco, Matteo Cianchetti
Scuola Superiore Sant’Anna, Italy

ID: 7046
Benchmarking Open-Source Algorithms for QRS Detection and RRI Editing in Textile Electrocardiography
Kana Eguchi{1}, Asmus Barth{2}, Nikolai Spicher{2}
{1}Kyoto University, Japan; {2}University Medical Center Göttingen, Germany

ID: 7153
Novel Systematic Design of Asymmetric Flexible Transceiver Coils with Optimal Wireless Power Transfer for Biomedical Implants
Asif Iftekhar Omi, Anyu Jiang, Baibhab Chatterjee
University of Florida, United States

ID: 7636
Feasibility of Using Knitted Textile Coils to Monitor Oedema
Claudine Gehin{1}, Matthieu Mesnage{1}, Amalric Montalibet{1}, Bertrand Massot{1}, Natacha Bayram{2}, Cyril Chaigneau{2}
{1}INSA Lyon, France; {2}Sigvaris, France

ID: 7837
An Implantable Ciliary Muscle LFP Recording and Transmitting System
Sebastian Kaltenstadler{2}, Bishesh Sigdel{1}, Sven Schumayer{1}, Raphael Steinhoff{2}, Torsten Straßer{1}, Albrecht Rothermel{2}
{1}Eberhard Karls Universität Tübingen, Germany; {2}Universität Ulm, Germany

Friday AM Coffee Break
10:00:00 AM - 10:30:00 AM
Room: Veracruz Hall

Exhibit Hall Open (Friday)
10:00:00 AM - 3:30:00 PM
Room: Veracruz Hall

Engineering Models and Systems for Health Disparities Research - Part 2
10:30:00 AM - 12:00:00 PM
Room: Cancun
Concept to Clinical Trials: Translating Technology from Benchtop to Bedside
10:30:00 AM - 12:00:00 PM
Room: Coronado D&E

The goal for many engineers in medicine and biology is to translate their innovative development into a clinical trial to demonstrate impact in patient care. This requires many steps from finding the right clinician partner, applying for appropriate regulation approval and exemption status, designing a clinical trial with the appropriate endpoints and statistical power, and supporting the technology development during the duration of the clinical trial. The goal of this session is to hear from 3 clinician-scientist pairs who have developed and tested technology in clinical trials in the areas of interventional radiology, surgery, and radiation oncology. The speakers will discuss how they navigated the steps described above, things that they learned during the process, and their advice to others embarking on these important endeavors. The examples will highlight technologies and clinical trials in image guided interventions and therapies, but the overall concepts will be broadly applicable to technology development and clinical translation.

Organizer: Kristy Brock
The University of Texas MD Anderson Cancer Center, United States

10:30:00 AM - 12:00:00 PM
Room: Fiesta 5&6

The objective of the mini-symposium is to explore the complexities involved in the co-creation of policy recommendations for promoting equity in the field of Science, Technology, and Innovation (STI). The session will gather experts sharing insights and lessons learned in the collaborative process, diving into discussions surrounding the intersection of gender, STI, and policy formulation. The discussion will involve diverse perspectives: Maria Fernanda Cabrera, expert in leading international projects for social inclusion; María Teresa Arredondo, founder of a leading European Research Center in ehealth; Yolanda Ursa, expert in incorporating gender equality aspects in international dialogues and agreements; Marlien Herselman, with broad expertise in open innovation applied to Diversity, Inclusion and Equity (DIE); Bárbara di Camilo, expert in AI applied to healthcare; Arianna Dagliati, expert in deep learning models for healthcare; May Wang, advocate for the DIE cause in scientific research; and Cristina López, young researcher on co-creation of accessible and inclusive ehealth solutions. This diverse panel will dissect the challenges and triumphs of fostering inclusivity, offering a methodology and practical tools for those committed to advancing equity in the STI landscape. It is a unique opportunity to absorb successful case studies, navigate obstacles, and harness the power of co-creation. The session is tailored for individuals and organizations passionate about shaping a more equitable future through innovative approaches to policy development, gaining a deeper understanding of the dynamics driving change in the realm of policies in STI.

Organizers: María Fernanda Cabrera{4}, María Teresa Arredondo{4}, Yolanda Ursa{3}, Marlien Herselman{1}, Bárbara Di Camilo{5}, Arianna Dagliati{6}, May Wang{2}, Cristina López{4}
{1}Council of Scientific & Industrial Research, South Africa; {2}Georgia Institute of Technology, United States; {3}Inmark Europa, Spain; {4}Universidad Politécnica de Madrid, Spain; {5}University of Padova, Italy; {6}University of Pavia, Italy
Technical Program – Friday, July 19th

Theme 2 Keynote - Machine Learning Technologies for Accessible Point of Care Ultrasound
10:30:00 AM - 11:30:00 AM
Room: Coronado H-J

Purang Abolmaesumi received his BSc (1995) and MSc (1997) from Sharif University of Technology, Iran, and his PhD (2002) from UBC, all in Electrical Engineering. From 2002 to 2009, he was a faculty member with the School of Computing, Queen’s University. He then joined the Department of Electrical and Computer Engineering at UBC, where he is a Professor, with Associate Memberships to Department of Urologic Sciences and School of Biomedical Engineering.

Dr. Abolmaesumi’s internationally recognized research program investigates advanced topics in medical imaging, machine learning on data at scale, and image-guided diagnosis and interventions.

Dr. Abolmaesumi is a Distinguished University Scholar, and the recipient of the Killam Faculty Research Prize, the Killam Award for Excellence in Mentoring and the Killam Faculty Research Fellowship at UBC. He currently serves as an Associate Editor of the IEEE Transactions on Medical Imaging and has served as an Associate Editor of the IEEE TBME between 2008 and 2012. He is a Board Member of the International Society for Computer Aided Surgery, and has served on the Program Committees of the Medical Image Computing and Computing and Computer-Assisted Intervention (MICCAI), International Society for Optics and Photonics (SPIE) Medical Imaging, and the International Conference on Information Processing in Computer-Assisted Interventions (IPCAI).

Dr. Abolmaesumi served as the General Chair of IPCAI 2014 and 2015, and has served as Program Chair of IPCAI 2012 in Pisa and Workshop and Tutorial Chair of MICCAI 2011 and 2015. He also served as the Program Chair for MICCAI 2020, and local Chair for MICCAI 2023. Dr. Abolmaesumi is a member of the Royal Society of Canada, a Fellow of MICCAI, and a Fellow of the Canadian Academy of Engineering.

Cardiovascular monitoring: Invasive and Noninvasive Tools for Critically Ill Patients
10:30:00 AM - 12:00:00 PM
Room: Fiesta 9&10

In intensive care unit (ICU) or during surgery, anesthesiologists dedicate their efforts to ensure the hemodynamic stability of patients and to prevent potentially catastrophic episodes, such as hypotension, which might jeopardize a correct perfusion of vital organs. Despite the relative abundance of measurements in the operating room (OR) and ICU, an in-depth analysis of the pathophysiological alterations in cardiovascular control that may arise in such critical conditions is still limited. The use of mathematical approaches based on cardiovascular signal processing and modelling for the prediction and prevention of such problems represent a great potential. The purpose of this session is to provide an overview of the state-of-the-art cardiovascular signal processing and modelling techniques to quantitatively estimate cardiac and circulatory dysfunctions, and to provide indices or predictive models with the final goal to support the clinicians in preventing the insurgence of hemodynamic instability and life-threatening events.

Presenters: Manuela Ferrario{1}, Marta Carrara{2}
{1}Politecnico di Milano, Italy; {2}Politecnico di Milano, Italy
The proposed workshop will present the discovery process and the latest findings in neurophysiology leading to development of novel therapeutic interventions and systems for restoration of neuromotor function after spinal cord injury (SCI). • Dr. James Guest will discuss design considerations of electrical neuromodulation approaches to address SCI induced changes in muscles resulting from loss of motor neurons, aberrant circuit formation leading to abnormal tone, and loss of ability to control movements discretely. • Dr. Milos Popovic will demonstrate that a combination of a newly invented pulse shape and dry electrodes can generate a more comfortable user experience during stimulation compared to conventional balanced biphasic stimulation pulses delivered using conventional electrodes. • Dr. Matija Milosevic will show how a non-invasive brain-spine interface neuromodulation approach can efficiently elicit neuroplasticity and discuss the importance of stimulation parameters to adequately activate the spinal networks to excite corticospinal circuits. • Dr. Atsushi Sasaki will show a neuromodulation approach for inducing corticospinal plasticity using a brain-controlled electrical stimulation approach and discuss the key role of timing between motor intention and electrical stimulation for effective neuroplasticity. • Dr. Dimitry Sayenko will show how “artificial” afferent inputs induced by epidural or transcutaneous electrical spinal cord stimulation have the potential to enhance the excitability of spinal networks to amplify and restore voluntary movement function. The symposium will conclude with a panel discussion about future trends in neuromodulation to provide take home messages for electrical stimulation approaches after SCI.

Organizers: Matija Milosevic{2}, Atsushi Sasaki{2}, James Guest{2}, Milos Popovic{3}, Dimitry Sayenko{1}
{1}Houston Methodist Research Institute, United States; {2}University of Miami, United States; {3}University of Toronto, Canada

Theme 12 Keynote - Improving Maternal and Fetal Health Outcomes by Engineering Digital Twins of Pregnancy
2:30:00 PM - 3:30:00 PM
Room: Coronado H-J

Michelle L. Oyen is the inaugural Director of the new Center for Women's Health Engineering, based in the McKelvey School of Engineering, Washington University in St. Louis. Michelle has degrees in Materials Science and Engineering (BS), Engineering Mechanics (MS), and a PhD in Biophysical Sciences. She has worked on many problems in tissue biomechanics and biomimetic materials; she has researched engineering approaches to pregnancy and women's health for over twenty years. Her focus is on maternal and fetal health, and in methods to prevent, diagnose, and intervene in preterm birth. Current research projects include multi-scale modeling of placenta function, microstructural fracture models for amniotic sac rupture, and physical properties of the healthy and pathological uterus.
Biomedical Imaging & Microfluidics
10:30:00 AM - 12:00:00 PM
Room: Fiesta 3&4
Session Chair: Bai Jun and Manuel Hernandez

ID: 7611
Alternating Magnetic Field Generation and Interaction with Magnetic Polyelectrolyte Microcapsules
Robert Powell, Neda Habibi
University of North Texas, United States

ID: 7744
Modelling and Optimization of Fluid Dynamics, Microparticles and Cell Loading in Microfluidics
Ellen Slay{1}, Elena Mancinelli{1}, Mahetab Amer{2}, Virginia Pensabene{1}
{1} University of Leeds, United Kingdom; {2} University of Manchester, United Kingdom

ID: 7990
Bovine Embryo Development Monitoring Using Differential Electrical Impedance Spectroscopy
Mohammad Aftab Uzzaman{2}, M Arifur Rahman{1}, Aaron Ohta{3}
{1} Hawaii Pacific University, Hawaii Innovation Laboratory, Inc, United States; {2} University of Hawaii at Mānoa, United States; {3} University of Hawaii at Manoa, United States

ID: 7877
Design and Development of a Modular Perfusion Bioreactor Prototype Using 3D Printing
Rodrigo A. Gonzales Cabrera, María A. Rejas Núñez, Rosa M. Silva Salas, Estefany Macedo, Joaquin E. Martinez-Flores, Lizardo K. Torres-Ayala, Paulo Vela, Denis Castillo
Universidad Peruana Cayetano Heredia, Peru

Biosignals & Classifiers
10:30:00 AM - 12:00:00 PM
Room: Baja
Session Chair: Sirat Samyoun and Rita Huan-Ting Peng

ID: 7552
Measuring Changes in Cortical Processes During VR-Aided Physical Exercise - an EEG-Based Approach
Rory O’Keeffe, Neha Mehta, Yair Shahar, Sarmad Mehrdad, Anat Lubetzky, S. Farokh Atashzar
New York University, United States

ID: 7533
Predicting Amyotrophic Lateral Sclerosis Progression: An EMG-Based Survival Analysis
Irene Rechichi{1}, Gianluca Amprimo{1}, Alessandro Cicolin{2}, Gabriella Olmo{1}
{1} Politecnico di Torino, Italy; {2} Università di Torino, Italy
Technical Program – Friday, July 19th

ID: 7819
**Characterizing sEMG Changes with Muscle Fatigue for Lower-Extremity Prostheses and Exoskeletons Control**
Wenze Shang{3}, Ruisen Huang{3}, Yongji Lin{3}, Fengyan Liang{1}, Ming Yin{1}, Xiao-Ping Lu{2}, Xinyu Wu{3}, Fei Gao{3}
{1}Hainan University, China; {2}Macau University of Science and Technology, China; {3}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

ID: 7690
**ECG Abnormality Detection Using MIMIC-IV-ECG Data via Supervised Contrastive Learning**
Zhale Nowroozilarki{1}, Sicong Huang{1}, Rohan Khera{2}, Bobak Mortazavi{1}
{1}Texas A&M University, United States; {2}Yale University, United States

ID: 7259
**Advancing Cuffless Arterial Blood Pressure Waveform Estimation: Time-Series Deep Neural Network Approach**
Bo Cheng{1}, Hongda Huang{1}, Zhengbi Song{1}, Shenghao Wu{1}, Qing Liu{2}, Yali Zheng{1}
{1}Shenzhen Technology University, China; {2}Xi’an Jiaotong-Liverpool University, China

ID: 6897
**EEG-Based Estimation of Cognitive Workload Across Multiple Tasks**
Anita Susan Mathew{2}, Niraj Hirachan{2}, Calvin Joseph{2}, Maryam Ghahramani{2}, Jehu Lopez-Aparicio{1}, Raul Fernandez Rojas{2}
{1}National Autonomous University of Mexico, Mexico; {2}University of Canberra, Australia

### Learning, Detecting, & Classifying Alzheimer’s Disease
10:30:00 AM - 12:00:00 PM
**Room: Coronado P&Q**
Session Chair: Han Yuan and Srinivas Kota

ID: 6611
**Alzheimer’s Disease Classification from Speech Pause Distributions with Context Information**
Geet Khatri{1}, Reza Soleimani{1}, Katarina Haley{2}, Adam Jacks{2}, Edgar Lobaton{1}
{1}North Carolina State University, United States; {2}University of North Carolina at Chapel Hill, United States

ID: 7984
**Revealing Alzheimer’s Disease Dementia Patterns in [18F]Florbetapir PET with Independent Component Analysis**
Nigar Khasayeva{2}, Cyrus Eierud{3}, Kyle M. Jensen{2}, Enrico Premi{1}, Barbara Borroni{4}, Vince D. Calhoun{3}, Armin Iraji{3}
{1}Stroke Unit, ASST Spedali Civili, Spedali Civili Hospital, United States; {2}TReNDS Center, Georgia State University, United States; {3}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States; {4}University of Brescia, United States
ID: 7288
**Balancing Spectral, Temporal and Spatial Information for EEG-Based Alzheimer’s Disease Classification**
Stephan Goerttler{2}, Fei He{2}, Min Wu{1}
{1}Agency for Science, Technology and Research, Singapore; {2}Coventry University, United Kingdom

ID: 7641
**Ranking the Importance of Spatiotemporal Windows of EEG Signals Results in a Better Alzheimer’s Disease Prediction**
Ronen Taub, Yonatan Savir
Technion - Israel Institute of Technology, Israel

ID: 7694
**A Deep Spatio-Temporal Attention Model of Dynamic Functional Network Connectivity Shows Sensitivity to Alzheimer’s in Asymptomatic Individuals**
Yuxiang Wei{2}, Anees Abrol{2}, James Lah{1}, Deqiang Qiu{1}, Vince D. Calhoun{2}
{1}Emory University, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States

ID: 7161
**Cross-Modality Translation with Generative Adversarial Networks to Unveil Alzheimer’s Disease Biomarkers**
Reihaneh Hassanzadeh{1}, Anees Abrol{2}, Hamid Reza Hassanzadeh{3}, Vince D. Calhoun{2}
{1}Georgia Institute of Technology, United States; {2}TReNDS Center, Georgia State University, Georgia Institute of Technology, Emory University, United States; {3}University of Florida, United States

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**Lower limb Rehabilitation & Assistance Robots**
10:30:00 AM - 12:00:00 PM
*Room: Durango 2*
*Session Chair: Ghaith Androwis and Yuan Yang*

ID: 6036
**Design of an Electromechanical Ankle-Foot Orthosis with Controlled Locking and Dorsiflexion Assist**
Rachel Huang, Justin Wood, Ryan Farris
*Messiah University, United States*

ID: 7496
**Biosignal-Based Control of a Robotic Gait Training Lifter**
Xiaoxi Zhang{1}, Hideki Kadone{3}, Tomohiro Konishi{1}, Yang Chen{1}, Modar Hassan{2}, Kenji Suzuki{2}
{1}Artificial Intelligence Laboratory, University of Tsukuba, Japan; {2}University of Tsukuba, Japan; {3}University of Tsukuba, University of Tsukuba Hospital, Japan
Technical Program – Friday, July 19th

ID: 7399
A Resistance-Free Sit-to-Stand Rehabilitative System Incorporated with Multi-Sensory Feedback
Nitheezkant R, Madhav Rao
International Institute of Information Technology Bangalore, India

ID: 7386
Single Joint Orthosis with a Compact Magnetorheological Damper Module for Resistance Training
Pakorn Wangsuekul, Modar Hassan, Kenji Suzuki
University of Tsukuba, Japan

ID: 7447
Synergy-Based Knee Angle Estimation on Stairs and Slopes for a Powered Transfemoral Prosthesis
Lifen Mo{3}, Fei Gao{4}, Yiou Sun{3}, Zhipeng Tang{3}, Jing Jie{3}, Zhenhua Song{1}, Wei-Hsin Liao{2}, Fengyan Liang{3}, Ming Yin{3}
{1}Affiliated Haikou Hospital of Xiangya Medical College, China; {2}Chinese University of Hong Kong, Hong Kong; {3}Hainan University, China; {4}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

ID: 8107
The Effects of Robotic Exoskeleton Gait Training on Improving Walking Adaptability in Persons with MS
Ghaith J. Androwis, Alfonse Gaite, Amanda Engler, Guang H. Yue, John DeLuca
Kessler Foundation, United States

Neural Signal Processing 4
10:30:00 AM - 12:00:00 PM
Room: Coronado B&C
Session Chair: Yiwen Wang and Jack Judy

ID: 7471
Speech Sensitivity Analysis of Spatially Distributed Brain Areas Using Stereotactic EEG
Darius Ivucic{4}, Michael Dexheimer{5}, Pedram Soroush{5}, Stephanie Ries{2}, Jerry Shih{3}, Dean Krusienski{5}, Tanja Schultz{1}
{1}Cognitive Systems Lab, Universität Bremen, Germany; {2}San Diego State University, United States; {3}UC San Diego Health, United States; {4}Universität Bremen, Germany; {5}Virginia Commonwealth University, United States

ID: 7756
Unipolar and Bipolar Signal Acquisition to Distinguish Artifacts from Nervous Activity
Juliette Barret{1}, Olivier Meste{1}, Clara Panzolini{2}, Célia Di Martino{2}, Philippe Blancou{2}, Aline Cabasson{1}
{1}Université Côte d’Azur, CNRS, I3S Laboratory, France; {2}Université Côte d’Azur, CNRS, IPMC, France
Technical Program – Friday, July 19th

ID: 7772
**Seizure Onset Zone Localization in Focal Epilepsy Using Stereo-EEG: SCSA and Visibility Graph Complementary Features**
Maria Sara Nour Sadoun, Taous Meriem Laleg-Kirati
National Institute for Research in Digital Science and Technology, France

ID: 7888
**Investigating Feasibility of Blind Optimization of a Nonlinear Neural Spike Enhancement Filter**
Noah Marosok, Hakan Töreyin
San Diego State University, United States

ID: 7969
**Tracking Dynamic Conditional Neural Correlation During Task Learning**
Zixu Wang, Shuhang Chen, Mingdong Li, Yiwen Wang
Hong Kong University of Science and Technology, China

ID: 8003
**Investigating Internal Dynamics in Monkey’s Primary Motor Cortex During Reaching**
Shicheng Qiu{1}, Hongwei Mao{2}, Shenghui Wu{1}, Yiwen Wang{1}
{1}Hong Kong University of Science and Technology, Hong Kong; {2}University of Pittsburgh, United States

**Neural Stimulation, Human Performance**
10:30:00 AM - 12:00:00 PM
Room: Coronado A
Session Chair: Jie Luo and James Weiland

ID: 7778
**Analyzing Voltage Transients Under Different Stimulation Configurations and Rates in Rat Cortex**
Christopher Nguyen{2}, Brandon Sturgill{2}, Sandeep Negi{1}, Stuart F. Cogan{2}
{1}Blackrock Neurotech, University of Utah, United States; {2}University of Texas at Dallas, United States

ID: 7835
**Ex Vivo Studies of Efficacy of DeepFocus: A Technique for Minimally-Invasive Deep-Brain Stimulation**
Yuhyun Lee, Vishal Jain, Maysam Chamanzar, Pulkit Grover, Mats Forssell
Carnegie Mellon University, United States

ID: 7930
**Modulation of Cerebellar Nuclear Activity by Transcranial AC Stimulation in Awake Rats**
Nuran Kavakli, Sofyan Hammad, Mesut Sahin
New Jersey Institute of Technology, United States
ID: 6840
**Long Short-Term Memory-Based Gait Phase Prediction Using Heel Acceleration in People with Gait Disorders**
Yuta Totoki{2}, Tetsuya Hasegawa{2}, Shouhei Shirafuji{1}, Jun Ota{2}, Arito Yozu{2}
{1}Kansai University, Japan; {2}University of Tokyo, Japan

ID: 6935
**Workload Assessment in Remote Mixed Reality Medical Procedural Training Through Physiological Signals**
Weronika Celnik{1}, Manuel Rebol{3}, Bo Lee{3}, Krzysztof Pietroszek{2}, Claudia Ranniger{3}, Colton Hood{3}, Adam Rutenberg{3}, Piotr Augustyniak{1}, Neal Sikka{3}
{1}AGH University of Krakow, Poland; {2}American University, United States; {3}George Washington University, United States

ID: 7030
**Classifying Wheelchair Propulsion Strategies: A New Bottom-Up Approach Based on Kinematic Data Analysis**
Hyunji Kim, San Hong, Woojin Park, Jooeun Ahn
Seoul National University, Korea

**Novel Sensing & Applications 1**
10:30:00 AM - 12:00:00 PM
*Room: Monterrey 1*
Session Chair: Changqing Jiang and Christopher Pulliam

ID: 6134
**Utilizing Microwave Radiation for the Eradication of Bacteria and Fungi**
Fred Mohamadi, Mohsen Zolghadri
Virinx LLC, United States

ID: 6477
**Preliminary Study of a Capacitive Diaper Sensor System for Urine Absorption Estimation**
Keisuke Shichitani, Kazuki Nakajima
University of Toyama, Japan

ID: 6809
**Wrist Measurement for Millimeter-Wave Non-Invasive Glucose Monitoring: Numerical Analysis of an Anatomically Realistic Tissue Model**
Lena Azuma, Ryo Natsuaki, Akira Hirose
University of Tokyo, Japan

ID: 6957
**Flexible Chip-Based Wearable Sensors Enhanced by Gold Nanoparticles for IFN-γ Detection**
Laicong Qiao, Tianruo Guo, Ruier Xue, Rui Sang, Danting Yang, Fei Deng
University of New South Wales, Australia
ID: 7416
**Advancing Towards a Wearable Ultrasound Sensor for Real-Time Bladder Volume Monitoring to Reduce Catheterization in Surgical Settings**
Rouzbeh Molaei Imenabadi{2}, Mojtaba Hasanpour Avanji{1}, Dinesh Bhatia{2}, Katherine Brown{2}
{1}Sahand University of Technology, Iran; {2}University of Texas at Dallas, United States

ID: 7977
**METAVEST: Liquid Metal Biomimetic Personal Cooling System for Industry Workers**
M Arifur Rahman{2}, Mohammad Aftab Uzzaman{4}, Radwa Elshenawy{1}, Wedyan Babatain{3}
{1}Hawai‘i Innovation Inc., United States; {2}Hawaii Pacific University, Hawaii Innovation Laboratory, Inc, United States; {3}Massachusetts Institute of Technology, United States; {4}University of Hawai‘i at Mānoa, United States

**Physiology Modeling & ML**
10:30:00 AM - 12:00:00 PM
Room: Durango 1
Session Chair: Elizabeth Healey and Kelvin Summoogum

ID: 7008
**HyperCell: Advancing Cell Type Classification with Hyperdimensional Computing**
Hossein Mohammadi{2}, Maziyar Baranpouyan{1}, Krishnaprasad Thirunarayan{2}, Lingwei Chen{2}
{1}Accenture Technology Labs, United States; {2}Wright State University, United States

ID: 6311
**Bayesian-Guided Generation of Synthetic Microbiomes with Minimized Pathogenicity**
Nisha Pillai{1}, Bindu Nanduri{1}, Michael J. Rothrock Jr.{2}, Zhiqian Chen{1}, Mahalingam Ramkumar{1}
{1}Mississippi State University, United States; {2}United States Department of Agriculture-Agricultural Research Service, United States

ID: 8102
**Model-Based Insulin Sensitivity and Beta-Cell Function Estimation from Daily Continuous Glucose Monitoring**
Elizabeth Healey{2}, Isaac Kohane{1}
{1}Harvard Medical School, United States; {2}Massachusetts Institute of Technology, United States

ID: 7724
**Learning Enabled Control for Optimal EPO Dosage in Virtual CKD Patients: Case of Bleeding and Missing Dosage**
Affan Affan, Tamer Inanc
University of Louisville, United States
ID: 7078
**Leveraging Observational and Prospective Data to Develop an Opioid Exposure Detection Model**
{1}Augusta University, United States; {2}Banner Health, United States; {3}Massachusetts Institute of Technology, United States; {4}Philips, United States

ID: 6568
**Deciphering Heartbeat Signatures: A Vision Transformer Approach to Explainable Atrial Fibrillation Detection from ECG Signals**
Aruna Mohan{3}, Danne Elbers{3}, Or Zilbershot{3}, Fatemeh Afghah{1}, David Vorachheimer{2}
{1}Clemson University, United States; {2}Northwell Health Physician Partners, United States; {3}Walkky, United States

**Sensing for Sleep, Stress, & Emotion**
10:30:00 AM - 12:00:00 PM
*Room: Fiesta 7&8*
Session Chair: Koichi Fujiwara and Tiantian Feng

ID: 6251
**Understanding Stress, Burnout, and Behavioral Patterns in Medical Residents Using Large-Scale Longitudinal Wearable Recordings**
Tiantian Feng, Shrikanth Narayanan
University of Southern California, United States

ID: 6340
**How Acute Stress Affects Sleep: Large-Scale Observations from Continuous Smart Ring Measurements in Free-Living Conditions**
Emmi Antikainen, Anna Iashina, Iman Alikhani, Mari Karsikas
Oura Health Oy, Finland

ID: 6854
**Measuring Skin Temperature as an Indicator for Cognitive Flow Using a Wrist-Worn Wearable**
William Romine, Tanvi Banerjee, Noah Schroeder
Wright State University, United States

ID: 7291
**STConvSleepNet: A Spatiotemporal Convolutional Network for Sleep Posture Detection**
Dikun Hu{2}, Weidong Gao{2}, Kai Keng Ang{1}, Mengjiao Hu{1}, Gang Chuai{2}
{1}Agency for Science, Technology and Research, Singapore; {2}Beijing University of Posts and Telecommunications, China

ID: 7436
**SLEEPWISE: A Continuous Sleep Monitoring and Cognitive Evaluation Platform in Ambient Residential Environment**
Shuwen Jin{3}, Danqiong Wang{1}, Xiao Ma{3}, Tao Li{1}, Feng Lin{3}, Lei Yu{2}, Qing Zhang{3}
{1}Shanxi Bethune Hospital, China; {2}Shanxi University, China; {3}Zhejiang Lab, China
Technical Program – Friday, July 19th

ID: 7505
**Beyond the Game: Multimodal Emotion Recognition Before, During, and After Gameplay**
Efstratia Ganiti-Roumeliotou{1}, Ioannis Ziogas{1}, Sofia Balula Dias{2}, Ghada Alhussein{1}, Herbert Franz Jelinek{1}, Leontios Hadjileontiadis{1}
{1}Khalifa University, U.A.E.; {2}Universidade de Lisboa, Portugal

**Signal Processing & Classification Methods for Wearable Sensors**
10:30:00 AM - 12:00:00 PM
Room: Coronado M&N
Session Chair: Ukash Nakarmi and Prachi Agarwal

ID: 6238
**A Robust Heart Rate Detection Pipeline of Wearable ECG Signals in Motion**
Carol Sadek{2}, Yilu Zhou{1}, Amanda Mills{1}, Bongmook Lee{3}, Veena Misra{1}, Yuwei Liao{2}, Arin Chaudhuri{2}
{1}North Carolina State University, United States; {2}SAS Institute Inc, United States; {3}SUNY Polytechnic Institute, United States

ID: 6286
**Heart Rate Imputation Using Accelerometers for Wearable Devices**
Byeongjin Choe, Hong Yoon Kim, Jaehun Uhm
Samsung Research, Korea

ID: 7065
**Clinical Assessment of a Lightweight CNN Model for Real-Time Atrial Fibrillation Prediction in Continuous Wearable Monitoring**
Quenaz Bezerra Soares{2}, Douglas de Andrade de Almeida{1}, Estela Ribeiro{1}, Renata Gomes Sanches Verardino{1}, Talita Costa Reis{1}, Nelson Samesima{1}, Rosangela Monteiro{1}, Fabio Biscegli Jatene{1}, Marco Antonio Gutierrez{3}
{1}Heart Institute, Clinics Hospital, University of Sao Paulo Medical School, Brazil; {2}Universidade de Sao Paulo, Brazil; {3}Universidade de São Paulo, Clinics Hospital, Brazil

ID: 7429
**Detection of Pharyngolaryngeal Activities in Real-World Settings Using Wearable Sensors**
Lila Gravellier{2}, Maxime Le Coz{3}, Jérôme Farinas{1}, Julien Pinquier{1}
{1}IRIT, Université de Toulouse, CNRS, Toulouse INP, UT3, France; {2}IRIT, Université de Toulouse, CNRS, Toulouse INP, UT3 and Swallis Medical, France; {3}Swallis Medical, France

ID: 7124
**Robust Multimodal Cough and Speech Detection Using Wearables: A Preliminary Analysis**
Yuhan Chen{2}, Jeffrey Barahona{2}, Iype Eldho{2}, Yanbing Yu{1}, Riyaz Muhammad{1}, Bill Kutsche{1}, Michelle L. Hernandez{3}, Delesha Carpenter{3}, Alper Bozkurt{2}, Edgar Lobaton{2}
{1}Murata Electronics North America, Inc., United States; {2}North Carolina State University, United States; {3}University of North Carolina at Chapel Hill, United States
ID: 7863  

Wrist EMG-Based Gestures Recognition for Finger and Wrist Motions  
Tingting Fu{1}, Ning Jiang{2}, Chaoming He{1}, Jiayuan He{2}  
{1}Southwest Jiaotong University, China; {2}West China Hospital of Sichuan University, China

Engineering Models and Systems for Health Disparities Research - Part 3  
2:00:00 PM - 3:30:00 PM  
Room: Cancun

Biomedical engineering and the underlying biomedical sciences hold great promise to deliver molecular to population-scale tools and therapies to advance human health. This session will explore how these advances can be harnessed to tackle disparities in health care, health access and increase biomedical technologies that can shrink the health gap. We bring together engineers, computational and biomedical scientists to showcase diverse approaches to addressing this challenge. Talks will focus on engineering methods and bioengineered platforms used to address comorbidities, chronic and cardiovascular diseases, and infection and immune compromising conditions that disproportionately affect underserved populations. Examples of how technology can advance minority health, as well as opportunities and threats that can widen disparities will be highlighted.

Presenters: Elebeoba May{2}, Renita Horton{1}  
{1}University of Houston, United States; {2}University of Wisconsin-Madison, United States

Investigating Sex-Based Differences in Cardiopulmonary Structure and Control  
2:00:00 PM - 3:30:00 PM  
Room: Fiesta 9&10

Across the globe there is almost a parity in the population among women and men; however, outside of clinical trials it is uncommon to find sex-balanced samples of subjects in most research studies and even less likely to find a targeted analysis of sex-based differences in the experimental outcomes. The objective of this mini-symposium is to provide a series of research presentations that provide examples of sex-based differences in the structure and/or control of the cardiopulmonary system. Although each talk will be delivered as an independent presentation, there will be a clear thematic connection across the mini-symposium. The first topic area will focus on the identification of sex-based differences in the central integration of peripheral respiratory sensor feedback through the analysis of breathing variability during steady-state resting and low levels of exercise. The second topic area will focus on sex-based differences in the heart, including anatomical structural, cardiac blood flow and blood energy. The third presentation will present a description of the sex-based differences in cardiopulmonary outcomes during sleep that result from acute and chronic opioid therapy. The final presentation will describe a stochastic modeling technique that can replicate and predict subtle differences in cardiopulmonary control, as demonstrated through the variability of breathing and heart-rate patterns. At the completion of this mini-symposium, attendees should expect to have gained an increased understanding and appreciation of sex-based differences in cardiopulmonary structure and control, and if applicable, include sex-based analyses in the design and implementation of their future research.

Organizers: Brett Busha{2}, Martha Stella{2}, Liang Zhong{1}, Azadeh Yadollahi{3}  
{1}Duke-NUS Medical School Singapore, Singapore; {2}The College of New Jersey, United States; {3}Toronto Rehabilitation Institute, Canada
ID: 6369
**Study on Thorax Attenuation Tomography Using Low-Frequency Ultrasound Differential Imaging**
Tong Zhang, Haokang Shi, Rui Guo, Maokun Li, Fan Yang, Shenheng Xu
Tsinghua University, China

ID: 6052
**Semantic Segmentation Refiner for Ultrasound Applications with Zero-Shot Foundation Models**
Hedda Cohen Indelman, Elay Dahan, Angeles Perez-Agosto, Carmit Shiran, Doron Shaked, Nati Daniel
GE Healthcare, Israel; GE Healthcare, United States

ID: 7440
**The Influence of Ignoring the Acoustic Attenuation Parameter During Full Waveform Inversion of Transcranial Ultrasound Data - Preliminary Study**
Tushar R, Sumit Kumar Yadav, Arun Kumar Thittai
Indian Institute of Technology Madras, India

ID: 7826
**Monitoring of Lung Ultrasound Acquisition Using Infrared Sensors and Artificial Intelligence**
Victor Mauricio Castillo Tello{2}, Sebastian Elias Rodriguez Rios{2}, Esteban Rolando Avilés Lino{2}, Benjamin Castañeda Aphan{3}, Stefano Enrique Romero Gutierrez{1}
{1}Laboratorio de Imágenes Médicas, Pontificia Universidad Católica del Perú, Peru; {2}Pontificia Universidad Católica del Perú, Peru; {3}Pontificia Universidad Católica del Perú, University of Rochester, Peru

ID: 7913
**3D Probe Localization from 2D Ultrasound Images Using an RFF-Enhanced Deep Neural Network**
Wilfor Andrés Cárdenas-Bedoya{2}, Sebastián Gil-González{2}, David Augusto Cárdenas-Peña{2}, Julián Gil-González{2}, Óscar David Aguirre-Ospina{1}, Álvaro Ángel Orozco-Gutiérrez{2}
{1}Servicios Especiales de Salud, Colombia; {2}Universidad Tecnológica de Pereira, Colombia

ID: 7210
**Deep Learning Classification of Prostate Cancer on Confidently Labeled Micro-Ultrasound Images**
Jake Pensa{2}, Wayne Brisbane{2}, Adam Kinnaird{1}, David Kuppermann{2}, Griffith Hughes{2}, Derrick Ushko{1}, Anthony Sisk{2}, Leonard Marks{2}, Rory Geoghegan{2}
{1}University of Alberta, Canada; {2}University of California, Los Angeles, United States
### Biomedical Signal Processing by Deep Learning

- **Time:** 2:00:00 PM - 3:30:00 PM
- **Room:** Coronado M&N
- **Session Chair:** Srinivas Kota and Yue Hu

#### ID: 6255
**Transformer-Based Model Captures Neural Representation Differences Between Nouns and Verbs in Spoken Narratives**
Yaoyao Wang{1}, Jiaying Zhang{2}, Siyi Tu{2}, Cheng Luo{1}
{1}Zhejiang Lab, China; {2}Zhejiang University, China

#### ID: 6642
**Biologically Interpretable Model for Precise Recurrence Prediction of Non-Small Cell Lung Cancer**
Yang Ai{1}, Xiuju Du{2}, Jing Liu{2}, Yinhao Li{1}, Lanfen Lin{3}, Jingsong Li{2}, Yen-Wei Chen{1}
{1}Ritsumeikan University, Japan; {2}Zhejiang Lab, China; {3}Zhejiang University, China

#### ID: 6839
**Cross-Speaker Training and Adaptation for Electromyography-to-Speech Conversion**
Kevin Scheck{1}, Zhao Ren{1}, Tom Dombeck{3}, Jenny Sonnert{3}, Stefano van Gogh{2}, Qinhan Hou{2}, Michael Wand{2}, Tanja Schultz{1}
{1}Cognitive Systems Lab, Universität Bremen, Germany; {2}Istituto Dalle Molle di studi sull’Intelligenza Artificiale, Switzerland; {3}Universität Bremen, Germany

#### ID: 6944
**Robust Sequence-to-Sequence Voice Conversion for Electrolaryngeal Speech Enhancement in Noisy and Reverberant Conditions**
Ding Ma{2}, Yeonjong Choi{2}, Fengji Li{1}, Chao Xie{2}, Kazuhiro Kobayashi{2}, Tomoki Toda{2}
{1}Beihang University, China; {2}Nagoya University, Japan

#### ID: 7539
**Semantic AutoSAM: Self-Prompting Segment Anything Model for Semantic Segmentation of Medical Images**
Assefa Wahd, Jessica Küpper, Jacob L Jaremko, Abhilash R. Hareendranathan
University of Alberta, Canada

#### ID: 6313
**The Pseudo-Siamese Framework Combines Transformer and CNN for Medical Image Generation**
Chao Fan{2}, Zechen Zheng{2}, Miao Wang{2}, Congqian Wang{2}, Chao An{3}, Yanwei Chen{1}, Xuelei He{2}, Xiaowei He{2}
{1}First Affiliated Hospital of Guangzhou Medical University, China; {2}Northwest University, China; {3}Sun Yat-sen University Cancer Center, China
Image Segmentation Using Deep Learning
2:00:00 PM - 3:30:00 PM
Room: Yucatan 1
Session Chair: Ehsan Kazemivalipour and Wei Shao

ID: 7096
Efficient Lung Segmentation from Chest Radiographs Using Transfer Learning and Lightweight Deep Architecture
Juan Camilo Rendón-Atehortúa{2}, David Augusto Cárdenas-Peña{2}, Genaro Daza-Santacoloma{2}, Álvaro Ángel Orozco-Gutiérrez{2}, Óscar Jaramillo-Robledo{1}
{1}Servicios Especiales de Salud, Colombia; {2}Universidad Tecnológica de Pereira, Colombia

ID: 7903
A Comparison Between Deep Learning Architectures for the Assessment of Breast Tumor Segmentation Using VSI Ultrasound Protocol
Emilio José Ochoa Alva{1}, Stefano Enrique Romero Gutierrez{1}, Thomas Marini{3}, Avici O’Connell{3}, Galen Brennan{3}, Jonah Kan{3}, Steven Meng{3}, Yu Zhao{3}, Tim Baran{3}, Benjamin Castañeda{2}
{1}Laboratorio de Imágenes Médicas, Pontificia Universidad Católica del Perú, Peru; {2}Pontificia Universidad Católica del Perú, University of Rochester, United States; {3}University of Rochester Medical Center, United States

ID: 7773
Integrating Vision Transformer with UNet++ for Hippocampus Segmentation in Alzheimer’s Disease
Thony Yan Liang, Christian Freytes, Xueting Cui, Bipul Simkhada, Marcos Bosques-Perez, Mercedes Cabrерizo, Armando Barreto, Malek Adjouadi
Florida International University, United States

ID: 7551
Transfer Learning with Interpretability: Liver Segmentation in CT and MR Using Limited Dataset
Pravda Jith Ray Prasad{3}, Ásmund Avdem Fretland{1}, Fritz Albregtsen{2}, Ole Jakob Elle{2}, Rahul Prasanna Kumar{1}
{1}Intervention Centre, Oslo University Hospital, Norway; {2}University of Oslo, Norway; {3}University of Oslo, Oslo University Hospital, Norway

ID: 7493
Robust and Generable Vertebrae Instance Segmentation with Domain Adaptation
Xiang Gao{1}, Liyun Tu{1}, Yongzhi Huang{1}, Longjie Wang{2}, Yong Liu{1}
{1}Beijing University of Posts and Telecommunications, China; {2}Peking University Third Hospital, China

ID: 8105
Via Multi-Attention Guided UNet for Thyroid Nodule Segmentation of Ultrasound Images
Xupeng Wang{2}, Zhuo Xiang{3}, Xiaoyu Tian{3}, Cheng Zhao{3}, Chuan-Ming Liu{1}, Tianfu Wang{3}, Chong-Ke Zhao{4}, Baiying Lei{3}
{1}National Taipei University of Technology, Taiwan; {2}Ping An Technology, Shenzhen University, China; {3}Shenzhen University, China; {4}Zhongshan Hospital, Fudan University, China
### Imaging: Ionizing Methods

**2:00:00 PM - 3:30:00 PM**  
**Room: Yucatan 2**  
**Session Chair: Benjamin Castaneda and Abdulrahman Alfuraih**

<table>
<thead>
<tr>
<th>ID</th>
<th>Title</th>
<th>Authors / Affiliations</th>
</tr>
</thead>
</table>
{1}Central Chest Institute of Thailand, Thailand; {2}Choate Rosemary Hall, United States; {3}Rajavithi Hospital, Thailand; {4}Thammasat University, Thailand; {5}Udon Thani Cancer Hospital, Thailand |
| 7687   | Optimization of Data Acquisition in Tomography Using Kalman Estimation Filter | Ramin Pashaie  
Florida Atlantic University, United States |
| 7692   | A Comparative Study of Texture Analysis Methods on the Classification Problem of DPLDs in HRCT Scans | Álvaro Albuquerque{2}, Eliana Almeida{1}, Fabiane Queiroz{1}  
{1}Federal University of Alagoa, Brazil; {2}Federal University of Alagoas, Brazil |
| 7841   | Vision Transformer Based Detection of Chronic Pulmonary Aspergillosis Lung Infections in Chest X-Ray Images | Tzu-Jung Fu{1}, Shu Lin{1}, Tsaipei Wang{2}, Kun-Ta Chou{3}, Shiang-Fen Huang{3}  
{1}National Chiao Tung University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan; {3}Taipei Veterans General Hospital, Taiwan |
| 7612   | Sensitivity Analysis of Gamma Index Calculations for Dosimetry Audits in Advanced Radiotherapy | Padmini Krishnadas{1}, Jessica Goldring{1}, Mohammed Hussein{1}, Nadia A Smith{2}, Spencer A. Thomas{1}  
{1}National Physical Laboratory, United Kingdom; {2}TÜV SÜD, United Kingdom |
| 7926   | Vertebrae Segmentation with Generative Adversarial Networks for Automatic Cobb Angle Measurement | Ying Zhen Tan{2}, Kian Wei Ng{1}, Johnathan Tan{1}, James Hallinan{1}, Xi Zhen Low{1}, Andrew Makmur{1}, Kee Yuan Ngiam{2}, Mohammed Shaheryar Furqan{2}  
{1}National University Health System, Singapore; {2}National University of Singapore, Singapore |
## Technical Program – Friday, July 19th

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<thead>
<tr>
<th>ID: 8033</th>
<th>Adaptive Impedance Matching with Fault Ride Through in Wireless Power Transfer for Implanted Medical Devices</th>
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<tr>
<td></td>
<td>Han Wu, Yufei Cai, Haolun Wu, Sultan Mahmud, Ali Nezaratizadeh, Adam Khalifa</td>
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<td>University of Florida, United States</td>
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<tr>
<th>ID: 8077</th>
<th>Reliability of a Cranial Window for Chronic Epidural Recordings from the Pig Primary Somatosensory Cortex</th>
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<td></td>
<td>Suzan Meijs, Felipe Rettore Andreis, Taha Janjua, Winnie Jensen</td>
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<td></td>
<td>Aalborg University, Denmark</td>
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<tr>
<th>ID: 7269</th>
<th>Interplay Between Cerebral and Muscular Activations During Motor Tasks: An fNIRS-sEMG Study</th>
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<tr>
<td></td>
<td>Ruisen Huang{3}, Wenze Shang{3}, Yongji Lin{3}, Fengyan Liang{1}, Ming Yin{1}, Xiao-Ping Lu{2}, Xinyu Wu{3}, Fei Gao{3}</td>
</tr>
<tr>
<td></td>
<td>{1}Hainan University, China; {2}Macau University of Science and Technology, China; {3}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China</td>
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<tr>
<th>ID: 7409</th>
<th>Sensitivity of Iterative Learning Control to Varying Initial Conditions for Gait Assistance</th>
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<td></td>
<td>Justin Golabek{1}, Musa Audu{1}, Ronald Triolo{1}, Nathaniel Makowski{2}</td>
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<td></td>
<td>{1}Case Western Reserve University, United States; {2}MetroHealth System, United States</td>
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<tr>
<th>ID: 6365</th>
<th>Estimating User-Specific Current Spread and Neural Health Parameters in a Model of Hearing with Cochlear Implants</th>
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<td>Xiaowei Xia{2}, Xiao Gao{2}, Tim Brochier{1}, David Grayden{2}</td>
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<td></td>
<td>{1}Cochlear Limited, Australia; {2}University of Melbourne, Australia</td>
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<th>ID: 7359</th>
<th>Optimizing Phosphenic Focality with Multi-Electrode Stimuli Using Design of Experiments</th>
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<tr>
<td></td>
<td>Kathleen Kish, James Weiland</td>
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<td>University of Michigan, United States</td>
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<td>8015</td>
<td>Decoding Continuous Forelimb Kinematics in Mice Using Single-Photon Calcium Imaging</td>
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<td>8016</td>
<td>Relationships Among Motor Unit Discharge Parameters Used to Estimate Synaptic Inputs to Motoneurons</td>
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<td>7292</td>
<td>An Inertial-Based Gait Normalcy Index for Motor Fluctuation Measurement Under an Unconstrained Walking Scenario</td>
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<td>7626</td>
<td>Improving Impaired Intermuscular Coordination After Stroke Through Synergy-Guided Human-Machine Interaction: A Pilot Study</td>
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<tr>
<td>8030</td>
<td>Assisting Sit-to-Stand Through Event-Based Electrical Stimulation of Trunk Control: A Preliminary Study</td>
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<tr>
<td>8068</td>
<td>Classification of Insomnia Using Cyclic Alternating Patterns in Sleep Microstructure</td>
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</tbody>
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## Technical Program – Friday, July 19th

### Myoelectric Control
2:00:00 PM - 3:30:00 PM  
**Room: Durango 2**  
Session Chair: Jerzy Sawicki and Feng Lin

ID: 6492  
**Modern Myoelectric Control – Is It Time to Change the Algorithmic Focus?**  
Rami Khushaba{4}, Oluwarotimi Williams Samuel{3}, Ali Al-Timemy{2}, Guanglin Li{1}  
{1}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {2}University of Baghdad, Iraq; {3}University of Derby, United Kingdom; {4}University of Sydney, Transport for NSW, Australia

ID: 6312  
**An EMG-Modulated Asymmetric Arm Bike for Stroke Rehabilitation**  
Elia Francesco Pedrazzini{1}, Santiago Price Torrendell{1}, Hideki Kadone{2}, Modar Hassan{1}, Kenji Suzuki{1}  
{1}University of Tsukuba, Japan; {2}University of Tsukuba, University of Tsukuba Hospital, Japan

ID: 7038  
**Development of an Electrical Current Stimulator for Activating Muscle Tissues in Biohybrid Machines**  
Riccardo Collu{2}, Judith Fuentes{1}, Samuel Sánchez{1}, Stefano Lai{2}, Massimo Barbaro{2}  
{1}Institute for Bioengineering of Catalonia, Italy; {2}Università degli Studi di Cagliari, Italy

ID: 7071  
**Therapy for Abnormal Muscle Synergies in Stroke Using the ULIX Low-Impedance Robot**  
Shawn Dirocco{2}, Seraphina Culp{1}, Rafael Casas{1}, Peter Lum{1}  
{1}Catholic University of America, United States; {2}Catholic University of America, Virginia Commonwealth University, United States

### Novel Sensing & Applications 2
2:00:00 PM - 3:30:00 PM  
**Room: Monterrey 1**  
Session Chair: Michael Mcshane and Shengjie Zhai

ID: 6439  
**Postable Spirometry: User-Assembled Vortex Whistle Spirometer**  
Ava Fascetti, Aatash Pestonjamasp, Colin Barry, Edward Wang  
University of California, San Diego, United States

ID: 6958  
**Design and Evaluate Semi-Dry Watermill-Like EEG Electrodes**  
Jui-Bang Lu{1}, Yu Tsao{2}, Yu-Te Wang{3}  
{1}Academia Sinica, Taiwan; {2}CITI, Academia Sinica, Taiwan; {3}CITI, Academia Sinica, Microsoft Research, Taiwan
ID: 7219
**The MRDust: Wireless Data Uplink & Localization via Magnetic Resonance Image Modulation**
Biqi Rebekah Zhao, Alexander Chou, Robert Peltekov, Elad Alon, Chunlei Liu, Rikky Muller, Michael Lustig
University of California, Berkeley, United States

ID: 7265
**Pilot Evaluation of Sevo Systems for Epilepsy: Equitable EEG for Coarse, Dense, and Curly Hair**
Jasmine Kwasa{1}, Evangeline Mensah-Agyekum{1}, Arnelle Etienne{1}, Russell Phillips{2}, Christina Patterson{2}, Pulkit Grover{1}
{1}Carnegie Mellon University, United States; {2}University of Pittsburgh, United States

ID: 7728
**Phosphorescence Lifetime Imaging for Monitoring an Insertable Hydrogel Multianalyte Sensor**
Brian Ko, Ridhi Pradhan, Michael McShane
Texas A&M University, United States

ID: 8090
**A Polymer Thick Film on an Organic Substrate Grid Electrode for UHF MRI**
Iris Yin-Ching Chen, Ilknur Ay, Hernan Millan, Giorgio Bonmassar
Harvard Medical School, Massachusetts General Hospital, United States

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### Sensors, Wearables & IoT
2:00:00 PM - 3:30:00 PM  
*Room: Durango 1*
Session Chair: Ramana Vinjamuri and Zhao Ren

ID: 6821
**XGBAge: Prediction and Identification of Factors Influencing Biological Age Using Wearable Accelerometer Data**
Jinjoo Shim{1}, Elgar Fleisch{2}, Filipe Barata{1}
{1}ETH Zürich, Switzerland; {2}ETH Zürich & University of St. Gallen, Switzerland

ID: 7157
**An Algorithmic Approach for Detecting Neuromotor Developmental Disabilities in Infants from Wearable Sensor Data**
Maria Despoina Siampou{3}, Luciano Nocera{3}, Jinseok Oh{2}, Beth A. Smith{1}, Cyrus Shahabi{3}
{1}Children’s Hospital Los Angeles, University of Southern California, United States; {2}Children’s Hospital Los Angeles, United States; {3}University of Southern California, United States

ID: 7788
**Leveraging 3D LiDAR Sensors to Enable Enhanced Urban Safety and Public Health: Pedestrian Monitoring and Abnormal Activity Detection**
Nawfal Guerfrachi{2}, Jian Shi{1}, Hakim Ghazzai{1}, Ahmad Alsharooa{2}
{1}King Abdullah University of Science and Technology, Saudi Arabia; {2}Missouri University of Science and Technology, United States
ID: 6862
**Integrating Wearable Sensor Technology and Machine Learning for Objective m-CTSIB Balance Score Estimation**
Marjan Nassajpour{1}, Mustafa Shuqair{1}, Amie Rosenfeld{2}, Magdalena Ioana Tolea{2}, James E Galvin{2}, Behnaz Ghoraani{1}
{1}Florida Atlantic University, United States; {2}University of Miami, United States

ID: 7246
**Dynamic Exposure Controlling and Suppression for Highly Robust Remote-PPG in Fitness**
Chang Xiao, Shuhan Yi, Dongfang Yu, Wenjin Wang
Southern University of Science and Technology, China

ID: 6266
**Computer Vision-Inspired Contrastive Learning for Self-Supervised Anomaly Detection in Sensor-Based Remote Healthcare Monitoring**
Nivedita Bijlani{2}, Maowen Yin{1}, Gustavo Carneiro{2}, Payam Barnaghi{1}, Samaneh Kouchaki{2}
{1}Imperial College London, United Kingdom; {2}University of Surrey, United Kingdom

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**Signal Processing in Brain Computer Interface**
2:00:00 PM - 3:30:00 PM
*Room: Coronado P&Q*
**Session Chair: Paolo Bonato and Fan Lam**

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ID: 6523
**Proxy–Based Masking Module for Revealing Relevance of Characteristics in Motor Imagery**
Hyeon-Taek Han, Sung-Jin Kim, Dae-Hyeok Lee, Seong-Whan Lee
Korea University, Korea

ID: 6790
**Bi-Stream Adaptation Network for Motor Imagery Decoding**
Zikai Wang{1}, Ang Li{1}, Zhenyu Wang{1}, Ting Zhou{2}, Tianheng Xu{1}, Honglin Hu{1}
{1}Shanghai Advanced Research Institute, Chinese Academy of Sciences, China; {2}Shanghai University, Shanghai Frontier Innovation Research, China

ID: 6822
**Profiling a Raspberry Pi-Based Motor Imagery Classification to Facilitate At-Home BCI for Children with Disabilities**
Oluwagbenga Paul Idowu{2}, Eli Kinney-Lang{2}, Adam Gulamhusein{1}, Brian Irvine{1}, Adam Kirton{2}, Hatem Abou-Zeid{1}
{1}University of Calgary, Canada; {2}University of Calgary, Alberta Children’s Hospital, Canada

ID: 6613
**Functional Connectivity Methods for Multi-Class Mental Workload Classification**
Arya Teymourlouei, Minsi Hu, Rodolphe Gentili, James Reggia
University of Maryland, College Park, United States
ID: 6659
Advancing Brain-Computer Interface Systems: Asynchronous Classification of Error Potentials
Andrea Farabbi, Luca Mainardi
Politecnico di Milano, Italy

ID: 6812
Enhanced BCI Performance Using Diffusion Model for EEG Generation
Yucun Zhong{2}, Lin Yao{1}, Yueming Wang{3}
{1}Affiliated Mental Health Center & Hangzhou Seventh People’s Hospital, Zhejiang University, China; {2}MOE Frontiers Science Center for Brain and Brain-Machine Integration, Zhejiang University, China; {3}Zhejiang University, Qiushi Academy for Advanced Studies, China

### Wireless Communication for Sensing
2:00:00 PM - 3:30:00 PM
Room: Fiesta 7&8
Session Chair: Edwin Kan and Amir Javan-Khoshkholgh

ID: 6152
Enhanced PTE and Throughput in Wireless Capacitive Power and Data Transfer via Biocompatible Dielectric Shielding
A N M Shahriyar Hossain, Pedram Mohseni, Hossein Miri Lavasani
Case Western Reserve University, United States

ID: 6155
A Batteryless Implantable System with Adaptive Near-Field Communication to Study Neurogastroenterological Disorders
Neha Gour, Anis Ehsani, Amir Javan-Khoshkholgh
California State University, Sacramento, United States

ID: 6478
Design of a Fully Integrated Hysteretic Controlled Reconfigurable Transmitter for Bioimplants
Sayan Sarkar, Yuan Yao, Wing-Hung Ki, Chi-Ying Tsui
Hong Kong University of Science and Technology, Hong Kong

ID: 6921
A Robust BLE-Compatible Wake-Up Receiver for Ingestible Device with In-Vivo Evaluation
Saebyeok Shin{1}, Yeseul Jeon{2}, Ian Ballinger{1}, Muhammad I. W. Khan{3}, Andrew Pettinari{1}, Alison M. Hayward{1}, Giovanni Traverso{1}, Anantha P. Chandrakasan{1}
{1}Massachusetts Institute of Technology, United States; {2}Massachusetts Institute of Technology, Qualcomm, United States; {3}MediaTek, United States

ID: 7135
Body-Coupled Communication and Energy Harvesting Smart Textile System for Next-Generation Wearables
Ali Nezaratizadeh, Asif Iftekhar Omi, Baibhab Chatterjee, Adam Khalifa
University of Florida, United States
Technical Program – Friday, July 19th

ID: 7931
Energy-Efficient Synchronous CDMA for Multiple Channel Access in Internet of Bodies
Anyu Jiang, Zihao Yang, Xueying Wang, Christopher Kim, Baibhab Chatterjee
University of Florida, United States

Friday Refreshments
2:00:00 PM - 4:00:00 PM
Room: Veracruz Hall

Friday Poster Session - Biomedical and Health Informatics 1.2
2:00:00 PM - 4:00:00 PM
Room: Veracruz Hall

ID: 118338
A Graph-Based Model for Predicting Post-Adrenalectomy Clinical Outcomes with Preoperative Data
Pei-Yan Li{1}, Tai-Lien Wu{1}, Yu-Wen Huang{1}, Vin-Cent Wu{2}, Jeff Chueh{2}, Chi-Shin Tseng{2}, Chung-Ming Chen{1}
{1}National Taiwan University, Taiwan; {2}National Taiwan University Hospital, Taiwan
Poster Board: 1

ID: 118367
Deep Learning for Surgical Phase Recognition in Endoscopic Pituitary Surgery: Insights from Real-World Data
Ángela González-Cebrián{2}, Igor Paredes{1}, Alfonso Lagares{1}, Paula de Toledo{2}
{1}Hospital Universitario 12 de Octubre, Spain; {2}Universidad Carlos III de Madrid, Spain
Poster Board: 2

ID: 118378
Agnostic, Multimodal Feature Selection in the Long-Term Prediction of Mild Cognitive Impairment
Pablo Bonilla-Escribano{1}, Linda Zhang{1}, Teodoro del Ser{1}, Pascual Sánchez-Juan{1}, Jussi Tohka{3}, Bryan Strange{2}
{1}Fundación Centro de Investigación en Enfermedades Neurológicas, Canada; {1}Fundación Centro de Investigación en Enfermedades Neurológicas, Spain; {2}Polytechnic University of Madrid, United Kingdom; {3}University of Eastern Finland, Finland
Poster Board: 3

ID: 118418
Autism Spectrum Disorder (ASD) Behavior Patterns Identification Using Summarization and BERTopic from Clinical Notes
Sookyung Bae{2}, Hangnyoung Choi{2}, Hwiyoung Kim{1}, Chaewon Lee{2}, Keun-Ah Cheon{2}
{1}Yonseiu University College of Medicine, Korea; {2}Younsei University College of Medicine, Korea
Poster Board: 4
ID: 118450
**Machine Learning Estimation of a Suitable Level of Physical Activity to Reduce Sleep Disorders**
Kenta Oshima{2}, Jerome Foo{3}, David Marcusson-Clavertz{1}, Jinhyuk Kim{2}
{1}Linnaeus University, Sweden; {2}Shizuoka University, Japan; {3}University of Alberta, Canada
Poster Board: 5

ID: 118455
**Identification of Pre-Frailty Stage of Elderly Using Demographic, Physical Function, and Gait Data**
Changwon Wang{1}, Hangsik Shin{2}
{1}Asan Medical Center, Korea; {2}University of Ulsan College of Medicine, Korea
Poster Board: 6

ID: 118460
**Action Unit Based CNN-RNN Model for Continuous Emotion Assessment**
Jaesuk Kim, Sun Yoo, JunHwan Kwon, KyeongTaek Oh
Yonsei University College of Medicine, Korea
Poster Board: 7

ID: 118470
**Smartwatch-Assessed Sleep and Quality of Life in Healthy Individuals**
Fan Wu, Elgar Fleisch, Filipe Barata
Centre for Digital Health Interventions, Switzerland
Poster Board: 8

ID: 118471
**Neuropsychiatric Outcomes in Long COVID in South Korea and Japan: Binational Population-Based Discovery and Validation Cohort Study**
Hayeon Lee{1}, Jinseok Lee{1}, Dong Keon Yon{2}
{1}Kyung Hee University, Korea; {2}Kyung Hee University Medical Center, Korea
Poster Board: 9

ID: 118474
**Co-Variability of Psychological Flow Intensity and Heart Rate During Startup Weekend, an Entrepreneurial Educational Program**
Masahiro Suzuki{2}, Hisashi Yoshida{2}, Kazuo Yana{1}, Noriko Taji{1}, Kiyoshi Asakawa{1}, Yeongjoo Lim{3}, Futoshi Akiba{4}
{1}Hosei University, Japan; {2}Kindai University, Japan; {3}Ritsumeikan University, Japan; {4}Ryukoku University, Japan
Poster Board: 10

ID: 118480
**Label Distribution Learning for Memory Decline: A Deep Learning Approach Using EEG Analysis**
Wei Chen{1}, Aldrin Domer{1}, Kapeleshh KS{1}, Hong Ji{2}
{1}MACNICA, Inc., Japan; {2}Xi’an Polytechnic University, China
Poster Board: 11
Technical Program – Friday, July 19th

ID: 118493
**Predicting Adverse Neonatal Outcomes Using Machine Learning and Electronic Health Records**
Farah Francis{2}, Saturnino Luz{2}, Honghan Wu{1}, Sarah Stock{2}, Rosemary Townsend{2}
{1}University College London, United Kingdom; {2}University of Edinburgh, United Kingdom
Poster Board: 12

ID: 118497
**Bridging the Language Gap in FND Care: A Comparative Analysis of Neurologists and Psychologists**
Shumit Saha{3}, Yang Lu{6}, Md Shadab Mashuk{4}, Daniela Di Basilio{1}, Matthew Shardlow{2}, Lana Yh Lai{5}, Ashley Williams{2}, Rajiv Mohanraj{5}
{1}Lancaster University, United Kingdom; {2}Manchester Metropolitan University, United Kingdom; {3}Meharry Medical College, United States; {4}Salford University, United Kingdom; {5}University of Manchester, United Kingdom; {6}York St. John University, United Kingdom
Poster Board: 13

ID: 118505
**Identifying Factors that May Cause Lower Sleep Efficiency for Cardiovascular Patients Taking β-Blockers**
Shaghayegh Chavoshian{2}, Shumit Saha{1}
{1}Meharry School of Applied Computational Sciences, United States; {2}University of Toronto-University Health Network, Canada
Poster Board: 14

ID: 118513
**Estimated Effect of the Device Placement Error in IMU Kinematics Acquisition in Outpatients Through Musculoskeletal Models**
Sergio Galindo-Leon, Aline Bolliger, Diego Paez-Granados
ETH Zurich, Switzerland
Poster Board: 15

ID: 118546
**XAI Prediction of Functional Connectivity in HS Football Athletes**
Ruihong Lyu{2}, Sumra Bari{2}, Bradley Fitzgerald{1}, Thomas Talavage{2}
{1}Purdue University, United States; {2}University of Cincinnati, United States
Poster Board: 16

ID: 118565
**Development of Deep Learning Models for the Detection of Sleep Disorders on Portable Monitors by Using an Engineering Approach**
Ángel Serrano Alarcón{2}, Maksym Gaiduk{1}, Natividad Martinez Madrid{2}, Ralf Seepold{1}
{1}Konstanz University of Applied Sciences, Germany; {2}Reutlingen University, Germany
Poster Board: 17
Technical Program – Friday, July 19th

ID: 118573
Sleep Regularity and Duration are Associated with Daily Self-Reported Wellbeing
Shelley Choi{1}, Szymon Fedor{1}, Robert Stickgold{1}, Akane Sano{2}, Viswam Nathan{3}, Michael Freedman{3}, Rosalind Picard{1}
{1}Massachusetts Institute of Technology, United States; {2}Rice University, United States; {3}Samsung Research America, United States
Poster Board: 19

ID: 118575
Predicting Self-Reported Wellbeing from Sleep with Mixed Effects Random Forest
Shelley Choi{1}, Szymon Fedor{1}, Robert Stickgold{1}, Viswam Nathan{2}, Michael Freedman{2}, Rosalind Picard{1}
{1}Massachusetts Institute of Technology, United States; {2}Samsung Research America, United States
Poster Board: 20

ID: 118578
Tailoring Pain Management Strategies: Insights from Wearable Technology and Biometric Data Analysis
Aditya Behal{1}, Aditya Srinivasan{1}, Prasad Shirvalkar{2}
{1}Albany Medical College, United States; {2}University of California San Francisco, United States
Poster Board: 21

ID: 118586
Designing a Conversational Voice Companion for Older Adults Living Alone Based on Large Language Models
Kwangsub So{1}, Bo-Ram Lee{1}, Ho-Jung Kim{1}, Jin-Ah Sim{1}, Dong-Soo Shin{1}, David Duong{2}, Kirsten Meisinger{2}, Dong-Ok Won{1}
{1}Hallym University, Korea; {2}Harvard Medical School, United States
Poster Board: 22

ID: 118595
PresQA: An LLM-Based Interactive Health Recommender System for Prescribed Medications and Exercises
Sirat Samyoun, Tanzeem Choudhury
Cornell University, United States
Poster Board: 23

Friday Poster Session - Biomedical Engineering Education and Society 1.2
2:00:00 PM - 4:00:00 PM
Room: Veracruz Hall

ID: 118397
Comparative Design and Analysis of Multimodal VR Simulations for IV Needle Insertion Training
Jarrett Woo, Jin Woo Kim, Jeremy Jarzembak, Ann James, Jennifer Biggs, Robert Clements, John Dunlosky, Kwangtaek Kim
Kent State University, United States
Poster Board: 24
Technical Program – Friday, July 19th

ID: 118611
Assessing Training Effectiveness and User Experience: A Pilot Study of 3D Printed and Augmented Reality-Based Pediatric Lumbar Puncture Simulators
Jose Caceres-Alban{1}, Jose Girard{1}, Alyssa Maguina{2}
{1}Instituto Nacional de Salud del Niño San Borja, Peru; {2}Pontificia Universidad Catolica del Peru, Peru
Poster Board: 25

ID: 118626
Immersive Neurosurgical Training: A Novel Approach Integrating Virtual Reality and 3D Printing
Jose Rosales-Juarez{2}, Jose Caceres-Alban{1}
{1}Instituto Nacional de Salud del Niño San Borja, Peru; {2}Pontificia Universidad Catolica del Peru, Peru
Poster Board: 26

Friday Poster Session - Biomedical Imaging and Image Processing 1.3
2:00:00 PM - 4:00:00 PM
Room: Veracruz Hall

ID: 118353
Easy-to-Use and High-Quality EEG Measurement Using Conductive Polymer-Coated Microneedle Electrodes as Assessed by Somatosensory Evoked Potentials
Tomoya Yamaguchi{1}, Yuta Kurashina{1}, Naotsugu Kaneko{2}, Kimitaka Nakazawa{2}, Hikaru Yokoyama{1}
{1}Tokyo University of Agriculture and Technology, Japan; {2}University of Tokyo, Japan
Poster Board: 27

ID: 118358
Speech Emotion Style Transfer on Spectrogram Using CycleGAN
John Lorenzo Bautista, Chanki Park, Seungyoon Nam, Hyunsoon Shin
Electronics and Telecommunications Research Institute, Korea
Poster Board: 28

ID: 118368
Microscopy Imaging Methods for Cell Membrane Extraction in H&E Stained Histopathological Sections
Yuichi Sugawara{1}, Lizhi Hu{1}, Masanobu Takahashi{1}, Masayuki Nakano{2}
{1}Shibaura Institute of Technology, Japan; {2}Tokyo Central Pathology Laboratory, Japan
Poster Board: 29

ID: 118369
Diagnosis Support System for Cervical Cancer Using Image Processing
Taisei Tanaka{1}, Shingo Sakashita{2}, Genichiro Ishii{2}, Toshiyuki Tanaka{1}
{1}Keio University, Japan; {2}National Cancer Center, Japan
Poster Board: 30
AI Analysis of Ultrasound Images for the Computation of Congenital Anomalies of the Kidney and Urinary Tract

Andrea Quinto{2}, Fabio Scarpa{2}, Davide Meneghesso{1}
{1}Hospital San Bassiano, AULSS 7, Italy; {2}University of Padua, Italy
Poster Board: 31

High-Speed Image-Based Measurement Method of Tracheal Cardiac-Induced Pulse Transit Time

Tomohiro Sueishi{2}, Makoto Komura{1}, Masatoshi Ishikawa{2}
{1}The University of Tokyo, Japan; {2}Tokyo University of Science, Japan
Poster Board: 32

High-Speed Tip Position Estimation of Tracheal Endoscope Probe with Ring-Shaped Optical Markers

Tomohiro Sueishi{2}, Makoto Komura{1}, Masatoshi Ishikawa{2}
{1}The University of Tokyo, Japan; {2}Tokyo University of Science, Japan
Poster Board: 33

Brain Image Analysis of ASD Using Large-Scale Deep Learning Models

Amane Okuno{1}, Ryoichi Yokoyama{1}, Takehiro Jimbo{2}, Hidetoshi Matsuo{2}, Makoto Nishimori{2}, Toshikaze Chiba{3}, Keiya Goto{3}, Toshiyuki Tanaka{1}
{1}Keio University, Japan; {2}Kobe University, Japan; {3}Tohoku University, Japan
Poster Board: 34

Development of a New Semi-Automatic Image Processing Workflow Intended to Quantify Double-Strand Breaks on Cell Co-Cultures

Myriam Oger{1}, Maëva Cherrière{2}, Suzanne De Araujo{1}, Justine Fredoc-Louison{1}, Xavier Butigieg{1}, Farah Nasser{1}, Thomas Loret{2}, Anne-Laure Favier{1}, Marco Valente{1}, Ghislaine Lacroix{2}, Sabine François{1}, Samir Dekali{1}
{1}French Armed Forces Biomedical Research Institute (IRBA), France; {2}French National Institute for Industrial Environment and Risks (INERIS), France
Poster Board: 35

Magnetization Transfer Ratio Reflects White Matter Tract Damage and Motor Inhibition in Degenerative Cervical Myelopathy

Grace Haynes, Fauziyya Muhammad, Lei Ding, Zachary Smith
University of Oklahoma, United States
Poster Board: 36
Introducing the STIMscope: An Open-Source Platform for Large Field-of-View Spatiotemporal Imaging and Patterned Illumination
Hamid Chorsi, Saray Soldado-Magraner, Federico Sangiuliano Jimka, Dean Buonomano, Dejan Markovic, Daniel Aharoni
University of California, Los Angeles, United States
Poster Board: 37

An EEG-Based Study on Time-Delayed Effective Connectivity of Normal Cognition and MCI Under Motion Detection Tasks
Boxin Sun{1}, Jinxian Deng{1}, Voyko Kavcic{3}, Bruno Giordani{2}, Tongtong Li{1}
{1}Michigan State University, United States; {2}University of Michigan, United States; {3}Wayne State University, United States
Poster Board: 38

Predicting Myocardial Perfusion Improvement After Coronary Revascularization: A Dual-Pathway Feature-Interaction Deep Learning Model
{1}Far Eastern Memorial Hospital, Taiwan; {2}National Taiwan University, Taiwan
Poster Board: 39

Pre-Trained Vision Transformer with Mixed Formula-Driven Supervised Learning for Cystoscopy Diagnosis
Wonjik Kim{1}, Atsushi Ikeda{3}, Yuu Nakajima{2}, Hirokazu Nosato{1}
{1}National Institute of Advanced Industrial Science and Technology, Japan; {2}Toho University, Japan; {3}University of Tsukuba, Japan
Poster Board: 40

A 3D Hole Filling Framework for Mesh Repairing of Intra-Oral Scan Models with Learning Geometric Point Offset
SuJeong Kim{2}, Su Yang{2}, Jiyong Han{2}, Sang-Heon Lim{2}, Jiyong Yoo{2}, Dahyun Song{2}, Goeun Kim{2}, Tae-Hoon Yong{1}, Sunjung Kim{1}, Won-Jin Yi{2}
{1}Osstem Implant, Co., Ltd., Korea; {2}Seoul National University, Korea
Poster Board: 41

Deep Learning Reconstruction-Based Ranking for Co-Localization Analysis in Highly Multiplexed Imaging
Oankar Patil, Benoit Marteau, Felipe Giuste, May Wang
Georgia Institute of Technology, United States
Poster Board: 42
Technical Program – Friday, July 19th

ID: 118442
**PFA-Net: A Point Feature Attention Network for 3D Object Detection from LiDAR Point Clouds in a Hospital Environment**
{1}Hansung University, Korea; {2}Osstem Implant, Co., Ltd., Korea; {3}Seoul National University, Korea
Poster Board: 43

ID: 118443
**Assessment of Tongue Colour Chart and Consideration of Image Compression Method for Tongue Image Analyzing System**
Monika Suzuki{1}, Yuki Watanabe{2}, Akira Morita{2}, Aya Murakami{4}, Takao Namiki{3}, Yoichi Miyake{1}, Yukihiro Nomura{1}, Toshiya Nakaguchi{1}
{1}Chiba University, Japan; {2}Chiba University Hospital, Japan; {3}Narita Hospital, International University of Health and Welfare, Japan; {4}Yokohama College of Pharmacy, Japan
Poster Board: 44

ID: 118447
**Enhancing CCTA Coronary Artery Reconstruction with Deep Learning and Localized Enhanced Vesselness Filtering**
Hsiang-Chin Chien{2}, Ching-Ping Wang{2}, Jung-Chih Chen{2}, Chia-Yen Lee{1}
{1}National United University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan
Poster Board: 45

ID: 118448
**MitoHiViT: A Hierarchical Vision Transformer Based Model for Mitotic Cell Detection Across Diseases and Species**
Ching-Ping Wang{2}, Hsiang-Chin Chien{2}, Yi-Chen Yeh{3}, Jung-Chih Chen{2}, Chia-Yen Lee{1}
{1}National United University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan; {3}Taipei Veterans General Hospital, Taiwan
Poster Board: 46

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**Friday Poster Session - Biomedical Imaging and Image Processing 1.4**
2:00:00 PM - 4:00:00 PM
*Room: Veracruz Hall*

ID: 118454
**BE-Swin UNETR: Boundary-Enhanced Swin UNETR for Paranasal Sinuses Segmentation in CT Images**
Dahyun Song, Su Yang, Jiyong Han, Sang-Heon Lim, Jiyong Yoo, Sujeong Kim, Goeun Kim, Tae-Hoon Yong, Sunjung Kim, Won-Jin Yi
seoul national university, Korea
Poster Board: 47
Technical Program – Friday, July 19th

ID: 118458
**Identifying Biomarkers for Overweight Through Multimodal Neuroimaging and Genetic Analysis**
Jiwon Chung, Hyunjin Park
Sungkyunkwan University, Korea
Poster Board: 48

ID: 118476
**Boundary-Enhanced U-Net: Redefining Accuracy in Breast Tumor MRI Analysis**
Naveed Urr Rehman, Arslan Akbar, Junfeng Wang, Suya Han
Zhengzhou University, China
Poster Board: 49

ID: 118479
**Electrode Position Extraction Method for Arbitrary Site Stimulation Focusing on Feature Quantities**
Tatsuya Onishi, Manami Kanamaru, Keita Tanaka
Tokyo Denki University, Japan
Poster Board: 50

ID: 118486
**OptiRes-DDPM for Portable OCT Image Quality Enhancement Toward Downstream AI-Based Ophthalmic Disease Diagnosis**
Ye Tian, Kaveri Thakoor
Columbia University, United States
Poster Board: 51

ID: 118492
**Validation and Reliability of Markerless Motion Capture System in Baseball Pitching Motions**
Ryusei Sassa{1}, Hiroki Shimizu{1}, Shinichi Kawamoto{1}, Daishiro Kobayashi{2}, Yuya Takaku{2}, Momoko Nagai-Tanima{1}, Tomoki Aoyama{1}
{1}Kyoto University, Japan; {2}Sportip Inc, Japan
Poster Board: 52

ID: 118514
**SAM for Weakly Supervised Nuclei Instance Segmentation**
Siwoo Nam, Hyun Namgung, Jaehoon Jeong, Sang Hyun Park
DGIST, Korea
Poster Board: 53

ID: 118526
**Shortwave Infrared Speckle Contrast Optical Spectroscopy for Noninvasive Monitoring of Cerebral Blood Flow**
Seoeun Cho, Seung Yup Lee
Kennesaw State University, United States
Poster Board: 54
ID: 118539
**Effect of Emotional Music on Function Connectivity in Major Depressive Disorder: A Machine Learning Approach**  
*Mingwei Huang, Lei Ding, Han Yuan*  
*University of Oklahoma, United States*  
*Poster Board: 55*

ID: 118549
**A Feasibility Study: Assessing the Use of a Pre-Trained Detection-Free Model on Cytologic Whole Slide Images for Efficient Prediction of Breast Cancer Recurrence Risk**  
*Hyun Do Jung{3}, Jun Suk Lee{1}, Seho Park{2}, Hwiyoung Kim{4}  
{1}Catholic Kwandong University International St. Mary's Hospital, Korea; {2}Severance Hospital, Korea; {3}Yonsei University, Korea; {4}Yonsei University College of Medicine, Korea*  
*Poster Board: 56*

ID: 118562
**Development of On-Block H&E Staining Technique for Improved Detection of Collagen in Fresh-Frozen Breast Tissue Samples**  
*Erin Snoddy, Tien Tang, Natalie Fowlkes, Thomas Huynh, Kari Brewer Savannah, Alejandro Contreras, Gregory Reece, Kristy Brock*  
*MD Anderson Cancer Center, United States*  
*Poster Board: 57*

ID: 118579
**Detection of Acute Myeloid Leukemia Without Labeling Individual Blood Cells**  
*Kunio Kashino{1}, Akisato Kimura{1}, Shoji Matsuya{2}  
{1}NTT Corporation, Japan; {2}NTT Medical Center Tokyo, Japan*  
*Poster Board: 58*

ID: 118601
**Advanced Techniques for High Frame-Rate Biomedical Ultrasound Imaging**  
*Chang-Lin Hu{1}, Meng-Lin Li{2}  
{1}Industrial Technology Research Institute, Taiwan; {2}National Tsing Hua University, Taiwan*  
*Poster Board: 59*

ID: 118606
**Coupled Multimodal Fusion to Capture Spatial Scale Sensitive Manifolds**  
*Sunitha Basodi, Vince Calhoun*  
*Georgia State University, United States*  
*Poster Board: 60*
### Friday Poster Session - Biomedical Signal Processing 1.3

2:00:00 PM - 4:00:00 PM  
**Room: Veracruz Hall**

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<td>118566</td>
<td>Exploring the Correlation Between Spatial Dynamic fMRI Networks and EEG Power-Spectrum</td>
<td>Souvik Phadikar, Vince Calhoun</td>
<td>Georgia State University, United States</td>
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<td>118567</td>
<td>Facial Expression Recognition with Wearable Radio Sensors</td>
<td>Aakash Kapoor, Upekha Delay, Edwin Kan</td>
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<td>118570</td>
<td>Temporal and Transitional Behaviors of Co-Activation Patterns in Resting-State Infant EEG</td>
<td>KC Nkurumeh, Lei Ding</td>
<td>University of Oklahoma, United States</td>
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<td>Short-Time Motion-Frequency-Sequence Feature Extraction Methods for Wi-Fi-Based Parkinson's Subtle Motion Clustering</td>
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<td>The University of Tokyo, Japan</td>
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<td>118613</td>
<td>A Method for Identifying and Tracking Changing Hippocampal Place Fields</td>
<td>Kathrine Clarke{2}, Anthony Burkitt{2}, Yanbo Lian{2}, Mary Ann Go{1}, Simon Schultz{1}, Catherine Davey{2}</td>
<td>{1}Imperial College, United Kingdom; {2}University of Melbourne, Australia</td>
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<td>118615</td>
<td>Critical Factors of Non-Linear Mutual Information and Time-Variant Granger Causality in Brain-Muscle Interaction Analysis</td>
<td>Nyi Nyi Tun, Fumiya Sanuki, Keiji Iramina</td>
<td>Kyushu University, Japan</td>
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<td>Positioning of the Cochlear Implant Correlates with Tissue Response and Hair Cell Survival</td>
<td>Tayla Razmovski, Kate Brody, Dimitra Stathopoulos, Dongcheng Zhang, Ellie Cho, Stephen O'Leary</td>
<td>University of Melbourne, Australia</td>
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ID: 118379
**Microfluidic Device for Investigating Sprouting Angiogenesis of Endothelial Cells Under Cytokine and Oxygen Gradients**
Hsiu-Chen Shih, Wei-Hao Liao, Yi-Chung Tung
Academia Sinica, Taiwan
Poster Board: 68

ID: 118386
**2D and 3D Scaffolds Based on Fmoc-Peptides to Culture Mesenchymal Stem Cell and Promote Differentiation**
Farzaneh Fouladgar, Robert Powell, Neda Habibi
University of North Texas, United States
Poster Board: 69

ID: 118434
**Closed-Loop Control System for Autonomous Type 1 Diabetes Management Device**
Marek Belgiorno, Rajani Muraleedharan
Saginaw Valley State University, United States
Poster Board: 70

ID: 118467
**Autonomous Exploration System of Electrical Stimuli Condition for In Vitro Skeletal Muscle Tissue Maturation with Bayesian Optimization**
Daiki Miyata{1}, Keitaro Kasahara{1}, Yujin Taguchi{1}, Yuta Tokuoka{1}, Takahiro Yamada{1}, Yuta Kurashina{2}, Akira Funahashi{1}, Hiroaki Onoe{1}
{1}Keio University, Japan; {2}Tokyo University of Agriculture and Technology, Japan
Poster Board: 71

ID: 118472
**Highly Transparent Neural Electrode Arrays Based on Cyclic Olefin Copolymer**
Yoon Seo, Hannah Noh, Negin Yeganeh Ghooshji, Seong-Geon Kim, Daeun Lim, Joonsoo Jeong
Pusan National University, Korea
Poster Board: 72

ID: 118502
**Silica Nanoparticles as Nanocarriers for Controlled Iron Release: In Vitro and In Vivo Models**
Rodrigo Isaac Rojas-Jiménez{2}, Moisés Rubio-Osornio{1}, Alejandro Muñoz-Diosdado{2}
{1}Instituto Nacional de Neurología y Neurocirugía, Mexico; {2}Instituto Politécnico Nacional, Mexico
Poster Board: 73

ID: 118516
**Optoelectronic Nano-Scaffolds for Neural Tissue Engineering**
Vini Gautam
Indian Institute of Science, India
Poster Board: 74
Friday Poster Session - Biorobotics and Biomechanics 1.2
2:00:00 PM - 4:00:00 PM
Room: Veracruz Hall

ID: 118399
Analysis of Gait Factors Relevant to Daily Living in Patients with Parkinson’s Disease
{1}Asahikawa Medical University, Japan; {2}Dokkyo Medical University, Japan; {3}Shiobara Hot Spring Hospital, Japan; {4}The University of Tokyo, Japan
Poster Board: 75

ID: 118405
Users Change Biomechanical Strategy When Told That Exoskeleton Assistance Will Turn On and Off at Random
Nicole Donahue, Courtney Haynes, Jessica Bradford
US Army DEVCOM Army Research Laboratory, United States
Poster Board: 76

ID: 118413
Development of a Multidimensional Pseudorandom Balance Perturbation Assessment
Manami Fujii{2}, Sophia Chirumbole{2}, Andrew Wagner{1}, Jaclyn Cacesse{2}, Ajit Chaudhari{2}, Daniel Merfeld{2}
{1}Creighton University, United States; {2}Ohio State University, United States
Poster Board: 77

ID: 118415
A Study on Performance Evaluation (MFDS) Standard of Modular Wheelchairs with Lightweight Frame
In Ho Hwang, SB Jung, HJ Oh, WC Jung, SW Yuk, JS Shim
Korea Orthopedics and Rehabilitation Engineering Center, Korea
Poster Board: 78

ID: 118416
Detection of Thoracic Aortic Aneurysm Utilizing Arterial Pulse Waveform Analysis Enhanced by Deep Learning
Joohyeon Im{1}, Jin-Oh Hahn{2}, Byeng Dong Youn{1}
{1}Seoul National University, Korea; {2}University of Maryland, United States
Poster Board: 79

ID: 118453
UWB-IMU Based Localization Method for the Evaluation of Indoor Autonomous Vehicles
Woo Chang Jung, IH Hwang, SB Jung, HJ Oh, SW Yuk
Korea Orthopedics and Rehabilitation Engineering Center, Korea
Poster Board: 80
Technical Program – Friday, July 19th

ID: 118500
Makita Hapiy 1.5: Low-Cost Myoelectric Prosthetic Prototype for Upper Limb Amputations
Sergio Felipe Serrano{3}, Manuel Felipe Fernandez{1}, Luis Alberto Huaman{2}
{1}UNI, Peru; {2}Universidad Continental, Peru; {3}UNMSM, Peru
Poster Board: 81

ID: 118535
Thermo-Sensitive Hydrogel Based Automatic Manipulator for Rapid Transport and Fabrication of Multi-Layered Cell Sheets
Sehong Kang, Hyunjoon Kong
University of Illinois at Urbana-Champaign, United States
Poster Board: 82

ID: 118553
Prospective Analysis of Postural Control Dynamics: Advanced Statistical Techniques and Demographic Stratification Through Foot Size Analysis
Arion Dey, Ritu Meda, Arya Shah, Genavieve Braden, Joerg Heintz, Manuel Hernandez
University of Illinois Urbana-Champaign, United States
Poster Board: 83

ID: 118569
Impact of Assumed Scattering Properties on Wearable Cerebral Oximeter
Zahra Rostampour Fathi, Seung Yup Lee
Kennesaw State University, United States
Poster Board: 84

ID: 118576
Robot-Assisted Surgery to Enable Brain-Wide Recording in Rodents
Alexandra Cheng, Yotaro Sueoka, Austin Graves, James Knierim, Timothy Harris
Johns Hopkins University, United States
Poster Board: 85

ID: 118592
Design of a Robotic Exoskeleton for Ankle Flexion Resistance
Kaushal Patel{2}, Gwendolyn Bryan{1}, Alexandra Voloshina{2}
{1}Florida Institute for Human and Machine Cognition, United States; {2}University of California, Irvine, United States
Poster Board: 86

ID: 118593
Towards a Deep Learning Model for Tissue Classification During Robotic Surgery via Tissue Mechanical Property Assessment
Songping Sun, Alisha Bhat, Aaron Li, Peyman Benharash, Erik Dutson, Rory Geoghegan
University of California, Los Angeles, United States
Poster Board: 87
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ID: 118596
Inhibition System of Cancer Using a Small-Scale Tumor Treating Fields Patch Robot
Hyein Kim, Minkook Lee, Jin Hyup Lee, Sungwoo Chun
Korea University, Korea
Poster Board: 88

ID: 118623
Knee Joint Torque Estimation with pMMG and sEMG for Human Limb-Exoskeleton Interaction
Jirou Feng{2}, Seulki Kyeong{1}, Jung Kim{2}
{1}Hannam University, Korea; {2}Korea Advanced Institute of Science and Technology, Korea
Poster Board: 89

ID: 118499
A Cardiovascular Platform to Reproduce PPG Signals for Parametric Studies
Bomi Lee, Adelle Ria Persad, Junki Hong, Jae-Hak Jeong, Yong-Hwa Park
Korea Advanced Institute of Science and Technology, Korea
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ID: 118501
Parametric Studies on Oscillometric Signal with Upper Arm Parameters
Bomi Lee, Jae-Hak Jeong, Junki Hong, Yong-Hwa Park
Korea Advanced Institute of Science and Technology, Korea
Poster Board: 91

ID: 118512
Utilizing PPG Signals for Early Screening of Pediatric Sleep Disordered Breathing: A Deep Learning Model
Anna Nai-Yun Tung{2}, Emily Gillett{1}, Michael Khoo{2}
{1}Children's Hospital Los Angeles, United States; {2}University of Southern California, United States
Poster Board: 92

ID: 118520
Peripheral Artery Disease Alters Ballistocardiogram Morphology
Sina Masoumi Shahrbabak{2}, Byeng Dong Youn{1}, Ramakrishna Mukkamala{3}, Jin-Oh Hahn{2}
{1}ONEPREDICT Inc., Korea; {2}University of Maryland, College Park, United States; {3}University of Pittsburgh, United States
Poster Board: 93

ID: 118521
Cardiovascular Responses to Cold Water Immersion and Rewarming
Sina Masoumi Shahrbabak{2}, Omer Inan{1}, Jin-Oh Hahn{2}
{1}Georgia Institute of Technology, United States; {2}University of Maryland, College Park, United States
Poster Board: 94
ID: 118528
**Oscillometric Blood Pressure Measurement: Mathematical Modeling of Area and Height Oscillograms**
Vishaal Dhamotharan{4}, Cederick Landry{4}, Mark Freithaler{4}, Jin-Oh Hahn{3}, Sanjeev Shroff{4}, Aman Mahajan{4}, Hao-Min Cheng{2}, Chen-Huan Chen{1}, Shih-Hsien Sung{1}, Ramakrishna Mukkamala{4}
{1}National Yang-Ming University, Taiwan; {2}Taipei Veterans General Hospital, Taiwan; {3}University of Maryland, United States; {4}University of Pittsburgh, United States
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ID: 118531
**The Cuff Inflation Pattern is an Important Input to Oscillometric Blood Pressure Computation Algorithms**
Ravinder Kumar{2}, Vishaal Dhamotharan{2}, Mahdi Jazini{2}, Hadi Daher{2}, Sanjeev Shroff{2}, Aman Mahajan{2}, Jin-Oh Hahn{1}, Ramakrishna Mukkamala{2}
{1}University of Maryland, United States; {2}University of Pittsburgh, United States
Poster Board: 96

ID: 118537
**A Smartphone-Based Device to Measure Venous Pressure**
Shipeng Wang{1}, Mark Freithaler{1}, Sanjeev Shroff{1}, Alisse Hauspurg{2}, Ramakrishna Mukkamala{1}
{1}University of Pittsburgh, United States; {2}UPMC, United States
Poster Board: 97

ID: 118550
**Early Diagnosis of Impulse Control Disorders in Children and Adolescents Based on Natural Language Processing and Sleep Patterns**
Wilhelm Daniel Scherz{1}, Jorge Avila-Campos{2}, Julian Echeverry Correa{2}, Paula Herrera{2}, Daniel Velez Gutierrez{1}, Ralf Seepold{1}
{1}Konstanz University of Applied Sciences, Germany; {2}Universidad Tecnologica de Pereira, Colombia
Poster Board: 98

ID: 118589
**Deep Learning and Support Vector Machine-Based Model for Estimating Progression of Myocardial Fibrosis Using ECG Images**
Rin Taniguchi{2}, Tetsuma Kawaji{1}, Koichi Fujiwara{2}
{1}Mitsubishi Kyoto Hospital, Japan; {2}Nagoya University, Japan
Poster Board: 99

ID: 118621
**Smartphone-Based Blood Pressure Monitoring via the Oscillometric Finger Pressing Method: Artery Location by Incremental Pressing**
Mark Freithaler, Shipeng Wang, Jesse Zhang, Vishaal Dhamotharan, Ramakrishna Mukkamala
University of Pittsburgh, United States
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### Technical Program – Friday, July 19th

#### Friday Poster Session - Computational and Synthetic Biology 1.2

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<td>Aligning Biomechanics and Neuroimages in Pig Brain Injury Models</td>
<td>Room: Veracruz Hall</td>
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<td>Integration of Scalp EEG and Intracranial EEG for Whole Brain Network Modeling</td>
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<td>Source Extents Estimation with Spatial Graph Fourier Filters</td>
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<td>Simulation Platform of Temporal Interference Stimulation for Theoretical Validation and Parameter Optimization in Silico</td>
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<td>Development of an Ultra-High-Definition and High-Fidelity Computational Eye Model</td>
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<td>Multiscale Model of Smooth Muscle-Mediated Perfusion in Cardiopulmonary Diseases</td>
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#### ID: 118423
**Aligning Biomechanics and Neuroimages in Pig Brain Injury Models**
Yuan Huang[2], Ishfaque Ahmed[1], Morgan LaBalle[1], William Reeves[1], Qun Zhao[1], Moira Taber[1], Erin Kaiser[1], Franklin West[1], Kevin Browne[3], Kacy Cullen[3], David Meaney[3], Taotao Wu[1]
{1} University of Georgia, United States; {2} University of Michigan, United States; {3} University of Pennsylvania, United States
Poster Board: 101

#### ID: 118506
**Integration of Scalp EEG and Intracranial EEG for Whole Brain Network Modeling**
Shihao Yang, Feng Liu
Stevens Institute of Technology, United States
Poster Board: 102

#### ID: 118510
**Source Extents Estimation with Spatial Graph Fourier Filters**
Shihao Yang[3], Meng Jiao[3], Jing Xiang[1], Neel Fotedar[4], Hai Sun[2], Feng Liu[3]
{1} Cincinnati Children’s Hospital Medical Center, United States; {2} Rutgers University, United States; {3} Stevens Institute of Technology, United States; {4} University Hospitals Cleveland Medical Center, United States
Poster Board: 103

#### ID: 118524
**Simulation Platform of Temporal Interference Stimulation for Theoretical Validation and Parameter Optimization in Silico**
Jeongju Moon, Younghoon Park, Kyungsik Eom
Pusan National University, Korea
Poster Board: 104

#### ID: 118529
**Development of an Ultra-High-Definition and High-Fidelity Computational Eye Model**
Tomoaki Nagaoka
National Institute of Information and Communications Technology, Japan
Poster Board: 105

#### ID: 118530
**Multiscale Model of Smooth Muscle-Mediated Perfusion in Cardiopulmonary Diseases**
Narasimha Rao Pillalamari, Zachary Cummins, Andrew Stine, Haoran Ma, Joseph Bender
United Therapeutics Corporation, United States
Poster Board: 106
Technical Program – Friday, July 19th

ID: 118548
**Subsets of Single Neurons Predict Ensemble Activity and Memory Choices**
Aditya Behal, Aditya Srinivasan, Matthew Shapiro
Albany Medical College, United States
Poster Board: 107

ID: 118602
**Multicomponent Molecular Dynamics Simulation Reveals the Effect of PTEN Breast Cancer Mutant R130Q on the Cell Membrane Association**
Rohit Karn, Arnold Emerson
Vellore Institute of Technology, India
Poster Board: 108

ID: 118607
**Identifying Underlying Phenotypic Characteristics of Seal DNA Methylation Data Using Machine Learning**
Noushin Ghaffari{1}, Prosenjit Roy{1}, Swaathi Suguna Venkatesh{1}, Stephen Gaughran{2}, Bridgett vonHoldt{2}
{1}Prairie View A&M University, United States; {2}Princeton University, United States
Poster Board: 109

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Friday Poster Session - Neural and Rehabilitation Engineering 1.3
2:00:00 PM - 4:00:00 PM
Room: Veracruz Hall

ID: 118400
**Development and Preliminary Validation of a Wearable Sensor-Based Device for Monitoring Hand Function**
Madison Bates, Makenna Pelfrey, Amanda Glueck, Sridhar Sunderam
University of Kentucky, United States
Poster Board: 110

ID: 118403
**Effects of Transducer Placements on Hearing and Vibration Propagation of Cartilage Conduction**
Seiji Nakagawa, Yusei Sugawara, Sho Otsuka
Chiba University, Japan
Poster Board: 111

ID: 118406
**Improving Balance in Elderly Individuals Using a Myoelectric-Controlled Lower Limb Exoskeleton**
Amandine Gesta{3}, Ramez Iskandar{1}, Giulia Corniani{2}, Abolfazl Mohebbi{3}, Paolo Bonato{2}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Harvard Medical School, United States; {3}Polytechnique Montréal, Canada
Poster Board: 112
ID: 118410
**Optical Imaging of the Mouse Cortical Neural Activities Driven by the Microstimulation Pulse Trains Based on Retinal and Neuromorphic Spike-Timing Sequences**  
Keisuke Yamada, Santa Fukuda, Yuki Hayashida  
*Mie University, Japan*
Poster Board: 113

ID: 118414
**Lesions Prediction in Post-Stroke Patients Using Delta-to-Alpha Ratios Strategy from EEG Signals**  
Hyeong-Yeong Park{1}, Seoyeon Kim{2}, Minji Lee{2}, Ji-Hoon Jeong{1}  
{1}Chungbuk National University, Korea; {2}The Catholic University of Korea, Korea
Poster Board: 114

ID: 118421
**Observation of Neuromuscular Dynamics Can be Improved Using a Dominant Muscle CCI Modification**  
Julian Martinez, Albert Titus, Sue Ann Sisto, Ghazala Saleem, Filip Stefanovic  
*University at Buffalo, United States*
Poster Board: 115

ID: 118440
**The Influence of Muscle Coactivation on the Gait of People with Parkinson’s Disease When Walking with Visual Cues**  
Mirabel Ewura Esi Acquah{1}, He Wang{1}, Xiaoli Guo{1}, Wei Chen{2}, Dongyun Gu{2}  
{1}Shanghai Jiao Tong University, China; {2}Shanghai Ninth People's Hospital, Shanghai Jiao Tong University, China
Poster Board: 116

ID: 118444
**PCA for Hand Function Assessment via High-Dimensional Biosignals**  
Alexandra Portnova-Fahreeva, Adria Robert-Gonzalez, Fatma Inanici, Chet Moritz, Heather Feldner, Katherine Steele  
*University of Washington, United States*
Poster Board: 117

ID: 118445
**Retinal Degeneration Increases Variabilities of Light-Evoked Spiking Activities in Ganglion Cells Depending on Stimulus Contrast**  
Da Eun Kim{1}, Sein Kim{1}, Byoung-Kyong Min{2}, Maesoon Im{1}  
{1}Korea Institute of Science and Technology, Korea; {2}Korea University, Korea
Poster Board: 118

ID: 118451
**Velocity Control Using Interaction Forces in Walkers During Walking on a Load-Controlled Treadmill**  
Eiki Nakada{1}, Akihito Ito{1}, Nobutaka Tsujiuchi{1}, Keisuke Kitano{2}  
{1}Doshisha University, Japan; {2}Tokyo Rika University, Japan
Poster Board: 119
Evaluation of Parallel Stimulation Characteristics Using CMOS Chips for Retinal Prosthesis
Yuki Nakanishi{3}, Takaya Hattori{3}, Wisaroot Sriitsaranusorn{3}, Kuang-Chih Tso{3}, Kenzo Shodo{4}, Yoshinori Sunaga{3}, Makito Haruta{1}, Hiroyuki Tashiro{2}, Yasuo Terasawa{4}, Jun Ohta{3}, Kiyotaka Sasagawa{3}
{1}Chitose Institute of Science and Technology, Japan; {2}Kyushu University, Japan; {3}Nara Institute of Science and Technology, Japan; {4}Nidek Co. LTD., Japan
Poster Board: 120

Enhancing SSVEP Responses Using Dual-Frequency tACS
Jeonghui Kim, Do-Won Kim
Chonnam National University, Korea
Poster Board: 121

Design of Vibration Spectrum that Realizes Fifth Formant Close to Natural Speech for Electrolarynx Using Machine Learning
Masaki Takeuchi, Boyu Wang, Shinichi Chikaki, Motofumi Fushimi, Masaki Sekino
The University of Tokyo, Japan
Poster Board: 122

Orthosis Stiffness Selection Method for Stroke Patients Using Single RGB Camera
Masataka Yamamoto{4}, Koji Shimatani{3}, Daisuke Matsuura{2}, Yusuke Murakami{1}, Naoya Oeda{1}, Hiroshi Takemura{4}
{1}Brain Attack Center Ota Memorial Hospital, Japan; {2}Fujita Health University, Japan; {3}Prefectural University of Hiroshima, Japan; {4}Tokyo University of Science, Japan
Poster Board: 123

Precise FES Control of Human Index Finger MP Joint
Hua Chen{1}, Yasutaka Nakashima{1}, Koki Honda{2}, Motoji Yamamoto{1}
{1}Kyushu University, Japan; {2}Tokyo University, Japan
Poster Board: 124

Development of a Multimodal Measurement and Stimulation System to Investigate the Effects of Transcutaneous Electrical Stimulation of the Phrenic Nerve
Tim Kalla, Laureen Wegert, Irene Lange, Jens Haueisen, Alexander Hunold
Technical University Ilmenau, Germany
Poster Board: 125

Generating Electric Field Along the Human Optic Nerve to Promote Axonal Regeneration
Pooyan Pahlavan, Connie Huang, Benjamin Kambiz Ghiam, Timothy Silliman, Jonathan Cavaleri, Darrin Lee, Kimberly Kinga Gokoffski, Gianluca Lazzi
University of Southern California, United States
Poster Board: 126
ID: 118522
**A Smart Device Interface for a Hand Exoskeleton**
Christopher Vogel, Mohammad Ghassemi, Derek Kamper
North Carolina State University & University of North Carolina at Chapel Hill, United States
Poster Board: 127

ID: 118533
**Development of a Multiple Electrode Array for a Regenerative Peripheral Nerve Interface to Increase Spatial Selectivity**
Zachary Bailey, Estelle Cuttaz, Aaron Lee, Joe Goding, Rylie Green
Imperial College London, United Kingdom
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ID: 118534
**Selective Intrafascicular Multimodal Sensory Recordings in Pigs Using Carbon Nanotube Yarn (CNTY) Electrodes**
Bhanu Prasad Kotamraju, Grant McCallum, Dominique Durand
Case Western Reserve University, United States
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ID: 118536
**Neural Processing of Virtual Object Hardness Emulated by Non-Invasive Neurostimulation: An fNIRS Study**
Aliyah Shell, Justin Asbee, Andres Pena, James Abbas, Ranu Jung
University of Arkansas, United States
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ID: 118543
**Soft Exoskeleton Combined with Stimulation for Hand Therapy**
Mohammad Ghassemi{1}, Alexander Sprague{1}, Xiaogang Hu{2}, Derek Kamper{1}
{1}North Carolina State University, United States; {2}Penn State University, United States
Poster Board: 131

ID: 118544
**Improving Focality and Minimizing Cross-Hemispheric Current Leakage in Bilateral HD-tDCS**
Rita Huan-Ting Peng{1}, Paul Camacho{1}, Brad Sutton{1}, Ananya Subramanian{1}, Tracey Wszalek{2}, Aaron Anderson{2}, Beni Mulyana{1}, Fan Lam{1}, Yuan Yang{1}
{1}University of Illinois Urbana-Champaign, United States; {2}University of Illinois Urbana-Champaign, United States
Poster Board: 132

ID: 118557
**Decoding Error-Related Potentials from EEG Signals During Electrically Stimulated Upper-Limb Movements**
Nikunj Bhagat{2}, Chandra Sekhar Seelamantula{1}
{1}Indian Institute of Science Bangalore, India; {2}Indian Institute of Technology Kanpur, India
Poster Board: 133
| ID: 118558 | **Neurodegenerative Burst Spike Pattern Generation and Classification in a Hyperbolic Neuronal Model**  
Ardavan Vakil, Miad Faezipour, Sudip Vhaduri  
Purdue University, United States  
Postor Board: 134 |
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**Friday Poster Session - Neural and Rehabilitation Engineering 1.4**  
2:00:00 PM - 4:00:00 PM  
Room: Veracruz Hall

| ID: 118560 | **Surface Stimulation on the Dorsum of the Foot to Prevent Toe Curling: A Case Report**  
Bridget Gagnier[3], Justin Golabek[1], Lisa Lombardo[2], Nathan Makowski[3]  
[1]Case Western Reserve University, United States; [2]Cleveland VA Medical Center, United States; [3]MetroHealth System, United States  
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| ID: 118561 | **A Novel Non-Diffractive Electromagnetic Beam Launcher Design for Non-Invasive Optic Nerve Stimulation**  
Peter Mayer, Kimberly Gokoffski, Gianluca Lazzi  
University of Southern California, United States  
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| ID: 118563 | **Calcium Imaging for Optimization of Waveforms for Neural Rehabilitation**  
Timothy Silliman, Gigi Niu, Steven Walston, Omid Sharafi, Kimberly Gokoffski, Gianluca Lazzi  
University of Southern California, United States  
Poster Board: 137 |
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| ID: 118571 | **Optimization of Sintering Process of Inkjet-Printed Neural Electrodes on Flexible Bioresorbable Polymer Substrate**  
Nisrine Bakri, Sahera Saleh, Tamara Sadek, Massoud Khraiche  
American University Of Beirut, Lebanon  
Poster Board: 138 |
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| ID: 118572 | **Cross-Task Differences in Cortical Activations for Dynamic Balance**  
Robert Magruder[1], Komal Kukkar[2], Jose Contreras-Vidal[2], Pranav Parikh[2]  
Poster Board: 139 |
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| ID: 118583 | **ElectroGLuE: Advancing Neural Interfaces for Cell-Type-Specific Electrophysiology**  
Upasana Ghosh, Lailah Ligons, Brenda Shields, Michael Tadross  
Duke University, United States  
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The Layer 7 Cortical Interface: Translation of a Scalable and Minimally Invasive Brain–Computer Interface Platform
Elton Ho, Mark Hettick, Adam Poole, Manuel Monge, Demetrios Papageorgiou, Kazutaka Takahashi, Morgan LaMarca, Daniel Trietsch, Kyle Reed, Mark Murphy, Stephanie Rider, Kate Gelman, Yoon Woo Byun, Timothy Hanson, Sanjay Bhatia, Peter Konrad, Michael Mager, Precision Neuroscience, United States
Poster Board: 141

Simultaneous Multi-Channel Intracortical Microstimulation with Ultramicroelectrode Arrays
Elizabeth Olivo{2}, Alexander Gonzalez{2}, Yupeng Wu{3}, Warren Grill{1}, Stuart Cogan{3}, Mark Orazem{2}, Kevin Otto{2}
{1}Duke University, United States; {2}University of Florida, United States; {3}University of Texas at Dallas, United States
Poster Board: 142

Electroencephalographic Analysis of Oscillatory Activity Specific to Emotional Transitions
Yuma Gonotsubo, Atsushi Aoyama
Keio University, Japan
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Inkjet-Printed, Bioresorbable Electrocorticography (ECoG) Array for Monitoring Epileptiform Activity
Sahera Saleh, Tamara Al-Sadek, Heba Badawe, Massoud Khraiche
American University of Beirut, Lebanon
Poster Board: 144

Toward High-Resolution Auditory Restoration: Computational Model for the Design of High-Channel-Count Cochlear Implants
Elsa Yolanda Acosta De Anda, Wonil Sohn, Chong Xie
Rice University, United States
Poster Board: 145

Modulation of Gustatory Perception by Visual information: An Electroencephalographic Study
Marie Koura, Atsushi Aoyama
Keio University, Japan
Poster Board: 146

Alterations in Muscle Synergies During Isometric Upper Limb Movements at Varied Contraction Levels in Chronic Stroke Survivors
Sungjin Bae{2}, Sourav Chandra{1}, William Rymer{2}
{1}Indian Institute of Technology Indore, India; {2}Northwestern University, United States
Poster Board: 147
ID: 118625
An Electroencephalographic Study of Category-Specific Memory Encoding
Atsushi Aoyama, Hiroyasu Mishima
Keio University, Japan
Poster Board: 148

ID: 118628
DBS Stimulators in Sub Cortical Regions of Parkinson's: A Study with Connectomes
Venkateshwar Rao R{1}, N Lavanya{3}, Khaja Pasha Shaik{2}
{1}CMR College of Engineering & Technology, India; {2}MLR Engineering College, India; {3}Osmania University College of Engineering, India
Poster Board: 149

ID: 118186
EEG and ECoG Based BCI for Classification of Five Individual Finger Flexion and Grasp Movement
Krishna Dev R, Eashita Chowdhury, Manjunatha Mahadevappa
Indian Institute of Technology Kharagpur, India
Poster Board: 150

Friday Poster Session - Technology for Women and Children's Health/Equity and Access for Well-health 1.2
2:00:00 PM - 4:00:00 PM
Room: Veracruz Hall

ID: 118249
A Novel Method for Quantifying Fluctuations in Daily Cardiovascular Parameters Across the Menstrual Cycle: Insights from Wearable Technology
Summer Jasinski{2}, David Presby{1}, Gregory Grosicki{2}, Emily Capodilupo{2}, Victoria Lee{2}
{1}University of Lausanne, Switzerland; {2}WHOOP, United States
Poster Board: 151

ID: 118380
Personalized Gesture Classification for Encouraging Non-Sedentary Behavior During Technology Use in People with Motor Disabilities
Momona Yamagami{1}, Alexandra Portnova-Fahreeva{2}, Claire Mitchell{2}, Junhan Kong{2}, Jacob Wobbrock{2}
{1}Rice University, United States; {2}University of Washington, Seattle, United States
Poster Board: 152

ID: 118419
Investigation of Pelvic Floor Muscle Influence During Childbirth Through Ultrasound Imaging Evaluation
Saori Morino{2}, Rika Kawabe{1}, Tomoki Aoyama{1}
{1}Kyoto University, Japan; {2}Osaka Metropolitan University, Japan
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ID: 118541
**Effect of Intervening Tissue Layers on Quantitative Ultrasound Measurement: A Phantom Study**  
*Mekdes Bezabh, Farah Deeba*  
*University of North Carolina at Charlotte, United States*  
Poster Board: 154

ID: 118559
**Adaptive Filter for Decontamination of Used Breast Pumps**  
*Susan Marron, Lauren Stracuzzi, Tariq Rahman*  
*Nemours Children's Health Delaware, United States*  
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### Friday Poster Session - Therapeutic & Diagnostic Systems and Technologies 1.2
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*Room: Veracruz Hall*

ID: 118250
**Comparison of Time Constants Before and After Temperature Load in a Novel Non-Invasive Vascular Assessment Technique Using Windkessel Model**  
*Yuki Ando*{2}, *Ryosuke Kasai*{2}, *Nae Hinata*{2}, *Masaki Kyoso*{1}  
{1}*Tokyo City University, Japan*; {2}*Tokyo University of Technology, Japan*  
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ID: 118261
**Real-Time Standalone Image Reconstruction for Multi-Slice Multiband EPI Using Matrix Vectorization and GPUs CUDA Implementation**  
*Beni Mulyana, Yuan Yang*  
*University of Illinois at Urbana Champaign, United States*  
Poster Board: 157

ID: 118263
**Designing Open-Source Systems for Assessing Tinnitus Relief in Mouse Models**  
*Caspar Chen, Alice Yen, Wei-Ming Yu*  
*Loyola University Chicago, United States*  
Poster Board: 158

ID: 118266
**Revolutionizing Cancer Treatment: Smart Nanoparticles and CRISPR-Cas9 Gene Therapy**  
*Aybuke Ulu Kutlu Yuksel*{1}, *Gizem Kursunluoglu*{1}, *Merve Ercan Ayra*{2}, *Cansu Umran Tunc*{3}, *Yasemin Yuksel Durmaz*{2}, *Ömer Aydin*{1}  
{1}*Erciyes University, Turkey*; {2}*Istanbul Medipol University, Turkey*; {3}*University of Utah, United States*  
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**Wearable Photodynamic Therapy Using Organic Light Emitting Diodes with Antibacterial Effect**
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{1}Korea Institute of Science and Technology, Korea; {2}Samsung Medical Center, Korea
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{1}Children’s National Hospital, United States; {2}Kennesaw State University, United States; {3}Stratio Inc, United States
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{1}Brigham Young University, United States; {2}Noorda College of Osteopathic Medicine, United States
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{1}LLusern Scientific Limited, United Kingdom; {2}University of South Wales, United Kingdom
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{1}Johns Hopkins School of Medicine, United States; {2}Johns Hopkins University, United States
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{1} Rady Children’s Hospital, United States; {2} University of California San Diego, United States  
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{1} Gachon University, Korea; {2} Inno QD, Korea  
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{1} Johns Hopkins University, United States; {2} University of Maryland, United States  
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{1}Center for Advanced Intelligence Project, RIKEN, Japan; {2}Japan Advanced Institute of Science and Technology, Japan; {3}Keio University, Japan; {4}The University of Tokyo, Japan; {5}Tokyo University of Agriculture and Technology, Japan; {6}Waseda University, Japan  
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{1}Griffith University, Australia; {2}Shibaura Institute of Technology, Japan; {3}Tokyo Medical and Dental University, Japan; {4}Tokyo University of Technology, Japan  
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*Shibaura Institute of Technology, Japan*  
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Victor Trevino{2}, David Thinnes{2}, Matthias Laschke{1}, Michael Menger{1}, Daniel Strauss{2}
{1}Institute for Clinical and Experimental Surgery, Saarland University Hospital, Germany;
{2}Saarland University Faculty of Medicine, Germany
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**Enhancing Sensory Perception Through Haptic Vests for Outside Field of View Attention Assistance**

Jose Trapero, David Thinnes, Elena Schneider, Daniel Strauss
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{1}Hellenic Mediterranean University, Greece; {2}University of Ioannina, Greece
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{1}NTT Device Technology Labs, Japan; {2}Waseda University, Japan
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{1}Kyoto University, Japan; {2}Tokyo University, Japan
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Benito Lorenzo Pugliese{2}, Adam Sebastian Tenforde{1}, Danilo Demarchi{2}, Paolo Bonato{1}
{1}Harvard Medical School, United States; {2}Politecnico di Torino, Italy
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{1}ETH Zurich, Switzerland; {2}OrthoTeam Gruppe, Switzerland
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{1}Dartmouth, United States; {2}Harvard Medical School, United States
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{1}Cooper University Healthcare, United States; {2}Kandu Health Inc., United States  
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