

EMBC Workshop Proposal

Workshop Type (select one):

- Full Day Workshop
- Half Day Workshop

Workshop Title:

Advances in Wearable Technology and Biomedical Devices: Opportunities and Challenges

Workshop Organizer Name & Affiliation:

Idir Mellal, University of Toronto, ON, Canada

Workshop Organizer/Speaker Name & Affiliation 1:

Milad Lankarany, University of Toronto, Canada

Workshop Organizer/Speaker Name & Affiliation 2:

Azadeh Yadollahi, University Health Network, Toronto, ON, Canada

Workshop Organizer/Speaker Name & Affiliation 3:

Tony Chanin, CEO Mvant Inc, Toronto, ON, Canada

Workshop Organizer/Speaker Name & Affiliation 4:

Youcef Fouzar, CIENA Corporation, Ottawa, ON, Canada

Workshop Organizer/Speaker Name & Affiliation 5:

Hossein Rouhani, University of Alberta, AL, Canada

Workshop Organizer/Speaker Name & Affiliation 6:

Mourad Ladhrouche, Universite Mouloud Mammeri - Tizi Ouzou, Algeria

Workshop Organizer/Speaker Name & Affiliation 6:

Ahmed Lakhssassi, Universite du Quebec en Outaouais, QC, Canada

Theme (Select one):

- 01. Biomedical Signal Processing
- 02. Biomedical Imaging and Image Processing
- 03. Micro/ Nano-bioengineering; Cellular/ Tissue Engineering & Biomaterials
- 04. Computational Systems & Synthetic Biology; Multiscale modeling
- 05. Cardiovascular and Respiratory Systems Engineering
- 06. Neural and Rehabilitation Engineering
- 07. Biomedical Sensors and Wearable Systems
- 08. Biorobotics and Biomechanics
- 09. Therapeutic & Diagnostic Systems and Technologies
- 10. Biomedical & Health Informatics
- 11. Biomedical Engineering Education and Society
- 12. Translational Engineering for Healthcare Innovation and Commercialization

Workshop Synopsis— Max 2000 Characters

Wearable Technology has emerged as an efficient and sustainable solution for healthcare applications (e.g., personalized health) and sports. The integration of micro/ nanoelectronics, wireless communications, and IoT technology with textile sensors – conductive yarns that can be knitted in dress, underwear, bra, sock, hat... – has revolutionized traditional use of wearable technology. The new portable systems benefit from the safety, comfort, and reliability features of textile technology. Using textile sensors, we can develop non-invasive prosthetic devices that simultaneously capture multiple electrophysiological, biochemical, and biomechanical signals from the human body. Therefore, textile-based wearables preserve users' comfort during daily use and open new perspectives in health science. Furthermore, smart textile technology enables the ability to act as a medium for human-computer interaction and creates endless possibilities for industry disruption.

The main objective of this workshop is to discuss the recent advancements of wearable systems, especially devices using textile technology, point out achievements and obstacles, and predict its growth. We will also propose and suggest some solutions according to the new trends in technology and science.

Our proposed workshop is intended to (i) cover the state of the art of the wearable medical devices and (ii) raise its strengths and shortcomings in different aspects concerning the expertise of the speakers. We believe that the proposed workshop is critical and highly timely for Medical Wearable Devices.

Our workshop is designed for a broad audience, including both research and industrial audiences. We have the opportunity of hosting worldwide leading scientists in wearable systems and medical instrumentations as well as highly impactful founders and CEOs of Canadian companies in Analog Design and Smart Textile Technology to address various aspects of wearable technology.