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Engineering in Medicine and
Biology Society in conjunction
with the 43rd Annual Conference
of the Canadian Medical and
Biological Engineering Society**
July 20–24, 2020, Montréal, Québec, Canada



Proposal for EMBC 2020 **Minisymposia: New trends in perinatal and pediatric imaging**

E. Grisan - IEEE Member, EMBS Member

EG is with the University of Padova (Italy). His research interests include the analysis of biomedical images, and the design of computer-aided diagnosis tools, with particular interest in fetal ultrasound image analysis. He has been in the program committee of IEEE CBMS conference (2012 and 2013) and associate editor for IEEE ISBI (2015), and is currently member of the Technical Committee for Medical Imaging and Image Processing of the IEEE EMBS

M.G. Linguraru - IEEE Member, EMBS Member

MGL, DPhil MA MSc, loves working with multidisciplinary teams of clinicians, scientists and engineers to help children grow healthy and happy. He is Principal Investigator in the Sheikh Zayed Institute for Pediatric Surgical Innovation at Children's National Hospital in Washington, DC, where he founded and directs the Precision Medical Imaging Group. Dr. Linguraru is also Professor with Tenure of Radiology and Pediatrics and Secondary Professor of Biomedical Engineering at George Washington University. He co-founded PediaMetrix LLC, a company focused on infant well-being by creating solutions to improve the management of conditions of early childhood. He joined the Sheikh Zayed Institute from the National Institutes of Health Clinical Center, where he maintains an appointment as Associate Investigator. He completed his doctorate at the University of Oxford and holds masters degrees in science and in arts from the University of Sibiu. He held fellowships at the French National Institute of Research in Computer Science and at Harvard University.

Dr. Linguraru is the recipient of numerous awards, including a prize for Excellence in Engineering by a Younger Engineer at the Houses of Parliament in London, UK. He is a member of the Technical Directors Board Committee of the IEEE Signal Processing Society, Vice-Chair of the Technical Committee on Biomedical Imaging and Image Processing of the IEEE Engineering in Medicine and Biology Society and served as Distinguished Lecturer of the society. He is the General Chair of the IEEE International Symposium on Biomedical Imaging 2019 in Venice, Italy.

N. Lepore - IEEE Senior Member, EMBS Member

NL is an associate professor in Radiology at the University of Southern California and at Children's Hospital Los Angeles. Her current work involves the development of numerical tools for the analysis of brain anatomical and functional magnetic resonance imaging data. She is a member of the Technical Committee for Medical Imaging and Image Processing of the IEEE EMBS.

Y. Wang – IEEE Senior Member, EMBS Member

YW is an associate professor with tenure in School of Computing, Informatics, and Decision Systems Engineering (CIDSE) at Arizona State University (ASU), where he directs the Geometry Systems Laboratory (GSL, <http://gsl.lab.asu.edu>). His research is in the areas of brain imaging, computer vision and statistical pattern recognition. He has published over 300 papers in a variety of technical conferences and journals. He received the "2016 Best Junior Faculty Researcher Award" from ASU CIDSE.

NEW TRENDS IN PERINATAL AND PEDIATRIC IMAGING

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Theme: *Biomedical Imaging and Image Processing*

Keywords: fetal imaging, children imaging, MRI, US.

Abstract The link between prenatal, perinatal (the time immediately before and after birth) and children healthcare, and the role of early life developmental alterations in later life health is a lively topic in the research community. Thus, having the possibility of monitoring developmental health through imaging and quantitative imaging biomarkers will allow a better understanding of this crucial period of life and of its long-term consequences.

Moreover, at variance with the vast number of tools developed by the research community for studying adult and elderly patients, a limited number of these is addressing the specificities and difficulties of younger patients. This invited session aims at bringing together researchers working on prenatal, perinatal and pediatric imaging, on image biomarkers discovery and quantitative image analysis of this crucial period of life.

Tentative list of Speakers (6 for 15 min each, allotted time 90 min)

A. Mary Baron Nelson PhD, RN, CPNP, Children's Hospital Los Angeles, California; School of Nursing, University of California, Los Angeles, US, mbnelson@chla.usc.edu

Title: TBA

Biosketch

Mary Baron Nelson received a faculty appointment after serving as a nurse practitioner since 2012 in the Division of Hematology, Oncology and Blood and Marrow Transplantation. Her research interests focus on the mechanisms of brain injury from childhood cancer treatment through neuroimaging, and including neurocognitive and psychosocial late effects and development of interventions.

She has been a nurse practitioner since 1995 and has primarily worked with children with brain tumors and childhood cancer survivors. Nelson has a MS degree in nursing from Boston College and a PhD in nursing from UCLA. She has been conducting research in childhood brain tumor survivors since 2007 and is actively involved in the Association of Pediatric Hematology-Oncology Nurses.

B. Mathieu Dehaes Ph.D., Institute of Biomedical Engineering, Université de Montréal, Montréal, QC, Canada, mathieu.dehaes@umontreal.ca

Title: TBA

Biosketch

Mathieu Dehaes is an assistant professor in Department of Radiology and Institut de génie biomédical, University of Montreal. His research interests involve developing new methods for Optical Imaging and Magnetic Resonance Imaging to assess and monitor brain health in paediatric populations. Techniques include measures of haemoglobin oxygen saturation, measures of cerebral blood flow and cerebral oxygen metabolism, and other structural/functional biomarkers of brain health.

C. Louis Collins PhD, NeuroImaging and Surgical Tools Laboratory, Montreal Neurological Institute, McGill University, Montreal, Quebec, Canada, louis.collins@mcgill.ca

Title: TBA

Biosketch

Louis Collins is a professor of Biomedical Engineering and Neurology & Neurosurgery in McGill University. He uses computerized image processing techniques such as non-linear image registration and model-based segmentation to automatically identify structures within the human brain. These techniques are applied to a large data base of magnetic resonance (MR) data from normal subjects to quantify anatomical variability. In image-guided neurosurgery (IGNS), these techniques provide the surgeon with computerized tools to assist in interpreting anatomical, functional and vascular image data, permitting the effective planning and execution of minimally invasive neurosurgical procedures. Automated atlas is essential in IGNS for thalamotomy and pallidotomy in the treatment of Parkinson's disease, or temporal-lobe depth electrode implantation in the diagnosis of epilepsy, since tissue targets in these procedures cannot be viewed directly on MR. Computerized atlas minimizes trauma to the patient and allows resection of the smallest amount of brain tissue necessary for effective therapeutic treatment.

D. Rafael Ceschin, MS, University of Pittsburgh, Department of Biomedical Informatics, 5607 Baum Boulevard, US, Rafael.Ceschin@pitt.edu

Title: TBA

Biosketch

Rafael Ceschin, MS is an assistant professor of University of Pittsburgh, Department of Biomedical Informatics. His research interests are Deep Neural Networks for Classification of Dysplastic Structures in Neonatal Brain MRI.

E. Franco Lepore, Ph.D, CHU Sainte-Justine Research Center, Montreal, Quebec, Canada, franco.lepore@umontreal.ca.

Title: TBA

Biosketch

Franco Lepore is a full professor in the Department of Psychology, University of Montreal. He is the director of CERNEC (Centre de recherche en neuropsychologie et cognition). His research interests are Development of visual system in children; Cerebral mechanisms of visual perception; Development and integration of callosal system; Auditory function in different human subject populations; Cross-modal plasticity and reorganization.

F. Gregory A. Lodygensky M.D., Research Center, Sainte-Justine University Hospital, 3175, Chemin de la Cote-Sainte-Catherine, Montreal, Quebec H3T1C5, Canada, gregory.lodygensky@recherche-ste-justine.qc.ca

Title: TBA

Biosketch

Dr. Lodygensky is a clinical associate professor of Paediatrics in University of Montreal, clinician researcher of CHU Sainte-Justine Research Center, director of Canadian Neonatal Brain Platform, associated researcher of Institut de cardiologie de Montréal (ICM). He is interested in the neurological trajectory of newborns at risk of brain damage, seeking to improve cerebral monitoring in acute periods, identifying neuronal disturbers and introducing neuroprotective neonatal strategies.