2022, 20th International Conference on Power Electronics Conference and Motion Control

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https://ieee-pemc2022.org/

SPECIAL SESSION SS2

2022 IEEE 20th International Power Electronics and Motion Control Conference (IEEE-PEMC 20220) will include Special Sessions, which are organized on highly specialized topics within the conference scope.

Session details:

Special Session Title: **Novel Applications of Machine Learning and Deep Learning in Medicine and Health (ML-MED)**

Session description (session scope, novelty, goals):	**Keywords, topics:**
Medical data and image analysis plays a key role in disease management, starting from baseline risk assessment and through diagnosis, staging, therapy planning, therapy delivery, and follow-up. Each type of disease has led to the development of more advanced data acquisition methods to help clinicians address the specific challenges in analyzing the underlying mechanisms of diseases. Imaging data is one of the most important sources of evidence for clinical analysis and medical intervention as it accounts for about 90% of all healthcare data. Researchers have been actively pursuing the development of advanced image analysis algorithms, some of which are routinely used in clinical practice. These developments were driven by the need for a comprehensive quantification of structure and function across several imaging modalities such as Computed Tomography (CT), X-ray Radiography, Magnetic Resonance Imaging (MRI), Ultrasound, Nuclear Medicine Imaging, and Digital Pathology. In the context of the availability of unprecedented data storage capacity and computational power, machine learning and especially deep learning have become the state-of-the-art techniques, providing unprecedented performance at learning patterns in medical data. The aim of this special session is to present and highlight novel applications, methods, architectures, and techniques of machine learning and deep learning in the healthcare domain.	- image reconstruction - image enhancement - segmentation - registration - computer aided detection - landmark detection - image or view recognition - automated report generation - multi-task learning - transfer learning - generative learning - self-supervised learning - unsupervised learning - federated learning - privacy preserving learning - explainability and interpretability - robustness and out-of-distribution detection - uncertainty quantification

Organizer(s) details:

First organizer: Prof. dr. ing. Lucian Mihai Itu

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Short bio:

Lucian Mihai Itu received the Dipl.-Eng. degree in Systems Engineering from the Transilvania University of Brasov in 2009 and the PhD degree in Systems Engineering in 2013 after having collaborated with Siemens Corporate Research, Princeton, USA during the doctoral studies. He is currently a Professor in the department of Automation and Information Technology. He has participated in numerous European, National and Industry funded R&D projects. His research interests are: artificial intelligence with focus on machine learning, modeling of the human physiology, and high performance computing. He has published over 70 papers in various international journals and conferences. He is joint author of over 50 international patent applications.

Second organizer: Prof. dr. ing. Constantin Suciu	
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Short bio:
Constantin Suciu received the Dipl.-Eng. degree in Electrical Engineering in 1994, the M.Sc. degree in Electrical and Computer Engineering in 1995, both from the Transilvania University of Braşov and the PhD degree in Electronics and Computer Engineering in 2000 from the Nottingham Trent University, UK. He has coordinated numerous European, National and Industry funded R&D projects. He is currently Professor at the Transilvania University of Brasov in the Department of Automation and Information Technology. His research interests are: distributed control and processing, embedded systems including GPU/ASIC/FPGA based architectures, and artificial intelligence. He is author or co-author of more than 60 scientific publications in various international journals and conferences.

Third organizer: Prof. dr. ing. Florin Moldoveanu	
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Short bio:
Florin Moldoveanu received a Dipl.-Eng. Degree in Electrical Engineering from ''Politechnica'' Institute of Brasov, Romania in 1975, and a Ph.D. degree in Electrical Engineering from UTBv, Romania in 1998, with a thesis on Control Engineering. He joined in 1990 the Department of Automation at UTBv where he is currently a Professor. He is the author or co-author of 7 technical books and has published more than 100 papers in scientific journals and proceedings of national and international conferences. Florin Moldoveanu participated in several national and international RFD projects. His main research interests include control engineering, distributed control systems and computer vision.

Fourth organizer: Șef lucr. dr. ing. Anamaria Vizitiu	
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Short bio:
Anamaria Vizitiu received the Bachelor / Master's degree in Systems Engineering in 2014 / 2016 in Advanced Systems in Automation and Information Technologies, and the PhD degree in Systems Engineering in 2020, both from the Transilvania University of Braşov, and after having collaborated with Siemens Healthineers during the doctoral studies. She has participated in numerous European, National and Industry funded R&D projects. Her research interests are: artificial intelligence with focus on machine learning, precision medicine, homomorphic encryption, and high performance computing. She has published 15 papers in various international journals and conferences. She is joint author of 6 international patent applications.

Information:

- IEEE IES Rules for Special Sessions organization: https://ieee-pemc2022.org/call-for-special-sessions/

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