

### Invited Plenary Speakers



## Luca FAES, University of Palermo, Italy

### *Information-Theoretic Analysis of Physiological Networks: a New Approach to Uncover Working and Impaired Homeostatic Regulation*

Luca Faes is Professor of Biomedical Engineering at the University of Palermo, Italy. He obtained his MS and PhD in Electronic Engineering at the University of Padova (1998) and at the University of Trento (2003), Italy, respectively. He was with the Dept. of Physics (2004-2013) and the BIOTech Center (2008-2013) of the University of Trento, and with the Bruno Kessler Foundation (FBK, Trento, 2013-2017).

He has been visiting scientist at the State University of New York (2007), Worcester Polytechnic Institute (2010), University of Gent (Belgium, 2013), University of Minas Gerais (Brazil, 2015), and Boston University (2016). He is a member of the IEEE Engineering in Medicine and Biology Society (IEEE-EMBS), for which he serves in the Technical Committee of Biomedical Signal Processing and regularly organizes symposia and invited sessions at the Annual EMBC Conference. He is member of the European Study Group on Cardiovascular Oscillations (ESGCO), and was organizer and Program Chair of the 8th ESGCO conference (Trento, Italy, 2014). He is Specialty Chief Editor of the Section "Information Theory" of Frontiers in Network Physiology, and serves as editor at several peer-review journals, including Entropy, Frontiers in Physiology, and Computational and Mathematical Methods in Medicine. His teaching activity includes Biosensors, Biomedical Devices and Biomedical Signal Processing.

His research activity is focused on the development of methods for multivariate time series analysis and system

modeling, with applications to cardiovascular neuroscience, cardiac arrhythmias, brain connectivity and network physiology. Within this fields, he has authored five book chapters and more than 150 peer-reviewed publications, receiving more than 4900 citations (h-index: 41; font: Scholar).



## **Radu-Emil PRECUP, Politehnica University of Timisoara, Romania**

### ***Evolving Fuzzy and Neural Network Models of Finger Dynamics for Prosthetic Hand Myoelectric-based Control***

Radu-Emil Precup (M IEEE '03 - SM IEEE '07) was born in Lugoj, Romania, in 1963. He received the Dipl.Ing. (Hons.) degree in automation and computers from the "Traian Vuia" Polytechnic Institute of Timisoara, Timisoara, Romania, in 1987, the Diploma in mathematics from the West University of Timisoara, Timisoara, in 1993, and the Ph.D. degree in automatic systems from the "Politehnica" University of Timisoara, Timisoara, in 1996.

From 1987 to 1991, he was with Infoservice S.A., Timisoara. He is currently with the Politehnica University of Timisoara, Romania, where he became a Professor in the Department of Automation and Applied Informatics, in 2000, and he is currently a Doctoral Supervisor of automation and systems engineering. He is also an Adjunct Professor within the School of Engineering, Edith Cowan University, Joondalup, WA, Australia, and an Honorary Professor and a Member of the Doctoral School of Applied Informatics with the Óbuda University (previously named Budapest Tech Polytechnical Institution), Budapest, Hungary. He is currently the Director of the Automatic Systems Engineering Research Centre with the Politehnica University of Timisoara, Romania. From 1999 to 2009, he held research and teaching positions with the Université de Savoie, Chambéry and Annecy, France, Budapest Tech Polytechnical Institution, Budapest, Hungary, Vienna University of Technology, Vienna, Austria, and Budapest University of Technology and Economics, Budapest, Hungary. He has been an Editor-in-Chief of the International Journal of Artificial Intelligence since 2008 and he is also on the editorial board of several other prestigious journals including IEEE Transactions on Fuzzy Systems, IEEE Transactions on Cybernetics, Information Sciences (Elsevier), Engineering Applications of Artificial Intelligence (Elsevier), Applied Soft Computing (Elsevier), Evolving Systems (Springer), Healthcare Analytics (Elsevier) and Cogent Engineering (Taylor & Francis).

He is the author or coauthor of more than 300 papers published in various scientific journals, refereed conference proceedings, and contributions to books. His research interests include mainly development and analysis of new control structures and algorithms (conventional control, fuzzy control, data-based control, sliding mode control, neuro-fuzzy control, etc.), theory and applications of soft computing, computer-aided design of control systems, modeling, optimization (including nature-inspired algorithms), and applications to mechatronic systems (including automotive systems and mobile robots), embedded systems, control of power plants, servo systems, electrical driving systems.

Prof. Precup is a corresponding member of The Romanian Academy, a member of the Subcommittee on Computational Intelligence as part of the Technical Committee (TC) on Control, Robotics and Mechatronics in the Institute of Electrical and Electronics Engineers (IEEE) Industrial Electronics Society, the Task Force on Autonomous Learning Systems within the Neural Networks TC of the IEEE Computational Intelligence Society, the TCs on Computational Cybernetics and Cyber-Medical Systems of the IEEE Systems, Man, and Cybernetics Society, the Task Force on Adaptive and Evolving Fuzzy Systems within the Fuzzy Systems Technical Committee of the IEEE Computational Intelligence Society, the International Federation of Automatic Control (IFAC) Technical Committee on Computational Intelligence in Control

(previously named Cognition and Control), the Working Group WG 12.9 on Computational Intelligence of the Technical Committee TC12 on Artificial Intelligence of the International Federation for Information Processing (IFIP), the European Society for Fuzzy Logic and Technology (EUSFLAT), the Hungarian Fuzzy Association, and the Romanian Society of Control Engineering and Technical Informatics.

He was the recipient of the Elsevier Scopus Award for Excellence in Global Contribution (2017), the "Tudor Tănăsescu" Prize from the Romanian Academy for data-driven controller tuning techniques (2020), the "Grigore Moisil" Prize from the Romanian Academy, two times, in 2005 and 2016, for his contribution on fuzzy control and the optimization of fuzzy systems, the Spiru Haret Award from the National Grand Lodge of Romania in partnership with the Romanian Academy in 2016 for education, environment and IT, the Excellency Diploma of the International Conference on Automation, Quality & Testing, Robotics AQTR 2004 (THETA 14, Cluj-Napoca, Romania), two Best Paper Awards in the Intelligent Control Area of the 2008 Conference on Human System Interaction HSI 2008, Krakow (Poland), the Best Paper Award of 16th Online World Conference on Soft Computing in Industrial Applications WSC16 (Loughborough University, UK) in 2011, the Certificate of Appreciation for the Best Paper in the Session TT07 1 Control Theory of 39th Annual Conference of the IEEE Industrial Electronics Society IECON 2013 (Vienna, Austria), a Best Paper Nomination at 12th International Conference on Informatics in Control, Automation and Robotics ICINCO 2015 (Colmar, France), a Best Paper Award at 7th International Conference on Information Technology and Quantitative Management ITQM 2019 (Granada, Spain), and was listed as one of the top 10 researchers in Artificial Intelligence and Automation (according to IIoT World as of July 2017).



## **Constantin VERTAN, Politehnica University of Bucharest, Romania**

### ***Eye-oriented Computer Vision Support for Medical Diagnosis and Behavioural Studies***

Professor Constantin VERTAN (IEEE SM 2009) holds an image processing and analysis tenure at the Image Processing and Analysis Laboratory from the Faculty of Electronics, Telecommunications and Information Technology at the „Politehnica“ University of Bucharest. He was an invited professor at INSA de Rouen and University of Poitiers (France) and was also appointed as Honorary Adjunct Professor in Computational Imaging by the College of Engineering and Informatics, NUI Galway, Ireland. For his contributions in image processing he was awarded the UPB's „In tempore opportuno“ award (2002), the CNCSIS's „In hoc signo vinces“ award (2004), and an Honoris Causa doctorate from the University of Pitești (România) (2019). He is author/ co-author of more than 150 journal, conference papers and patents in the field of image processing and its applications. He serves as associate editor for the European Journal of Image and Video Processing and was part of the organizing committee of several IEEE/ EURASIP conferences (including ICIP and EUSIPCO). He is chair of the Romanian IEEE Signal Processing Chapter SP01 and serves the academic community within the Romanian Agency for Quality in the High Education System as President (since 2015) of the Commission of Permanent Experts in Engineering. His research interests are general image processing and analysis, CBIR, fuzzy and medical image processing applications.



## Maria ROMANO, University of Naples Federico II, Italy

### *Foetal heart rate variability*

Maria Romano graduated in Electronic Engineering, with a 110/110 score. The thesis, entitled "*Processing of cardiocotographic signals in the frequency domain*", was awarded with the prize of the Bioengineering National Group for the year 2000-2001. Since April 2004, she has been a PhD in Bioengineering, 16th cycle. Since 1 April 2015 she has been a Researcher, ING-INF/06, at the Degree course in Computer Science and Biomedical Engineering of the University of Studies "Magna Grecia" of Catanzaro. Since 2 March 2020 she has been associate professor in the sector "09/G2 - Bioengineering". Her scientific research has explored several areas of the ING-INF/06 SSD, mainly in the field of biomedical signal processing and, among these, foetal heart rhythm (FHR), used in the field of foetal diagnostics. For the recording and analysis of the FHR, mainly two techniques were considered among the most widespread in the clinical field, cardiocotography and phonocardiography. Among the other signals object of the scientific activity, particular interest was addressed to cardiac activity (through the study of different signals and parameters), to muscular activity (studying, for example, electrical activity with EMG and passive characteristics such as muscle bioimpedance, through EIS) and finally to electrooculography. In all cases, specific emphasis was given to the methodological approach and therefore, where possible, to some clinical applications. More recently, research has also focused on healthcare management. She is the author or co-author of about 150 Scopus indexed documents, including more than 50 publications in peer reviewed international journals.

At the DMSC, University Magna Graecia of Catanzaro, she held the following courses:

- Bioengineering (Degree course "Computer and biomedical engineering");
- Measurements and processing of biomedical signals (Master of Science "Biomedical Engineering");
- Electronic Bioengineering Module (C.I. Genomics, proteomics and Metabolomics, Master of Science in Medical, Veterinary and Pharmaceutical Biotechnology);
- Biomedical instrumentation. She has participated as a researcher in several research projects.

From 1 October 2020 she moved to the University of Naples Federico II, where, currently, teaches and continues her research.