IEEE ICCA
Edinburgh 2019

The 15th IEEE International Conference on Control and Automation
Edinburgh, Scotland
July 16–19, 2019

PLENARY PANEL SESSION

Overview

Title: Trends in Research on Autonomous Systems

Time: 4:00–6:00pm, July 18, 2019

Venue: TBA

Chairs:

Professor Jie Chen, Tongji University, China
Professor Ben M. Chen, Chinese University of Hong Kong, China

Panelists:

Professor Bor-Chin Chang, Drexel University, USA
Professor Michael J. Grimble, University of Strathclyde, Scotland, UK
Professor Clara Ionescu, Ghent University, Belgium
Professor Zidong Wang, Brunel University London, England, UK

Abstract:
The theme of the IEEE ICCA plenary session this year is Trends in Research on Autonomous Systems. We are honored that four prominent researchers in our field will join this panel to share their expertise and visions, as well as to discuss about challenges and opportunities, in research on autonomous systems. Through direct conversation between these world-renowned panelists and other ICCA attendees, we hope to gain a deeper insight into some fundamental and emerging problems in the research area of autonomous systems and in our general field of control and automation. This panel will also serve as a platform for the audience, in particular students and other junior researchers, to hear the opinions of senior members of our community on issues we often face at the early stage of our career or study.

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Chairs

Biographies of the panel session chairs:

Professor Jie Chen, Tongji University, China

Professor Jie Chen is currently the President of Tongji University, China, an Academician of Chinese Academy of Engineering, Professor and Head of the State Key Laboratory of Intelligent Control and Decision of Complex Systems, and leader of an innovative research group of the Natural Science Foundation of China (NSFC). He also serves as the Vice President of the Chinese Association of Automation (2013–), the Managing Editor of the Journal of Systems Science and Complexity (2014–), and Editorial Board Member and associate editor for many international journals.

His main research interests include multi-objective optimization and decision of complex systems, multi-agent systems cooperative control, constrained nonlinear control. He has authored/co-authored 4 monographs and more than 100 research papers. He also holds 51 patents of invention. He is an IEEE Fellow, a recipient of the Science and Technology Awards of the Ho Leung Ho Lee Foundation, a Distinguished Young Scholar honored by NSFC and a Changjiang Scholar Distinguished Professor awarded by the Ministry of Education China. He received the National Natural Science Award of China (Class II) in 2014, and the National Science and Technology Progress Award of China (Class II) twice in 2009 and 2011, respectively.

Professor Ben M. Chen, Chinese University of Hong Kong, China

Professor Ben M. Chen is currently a Professor in the Department of Mechanical and Automation Engineering at the Chinese University of Hong Kong. He was a Provost's Chair Professor in the Department of Electrical and Computer Engineering, the National University of Singapore (NUS), where he was also serving as the Director of Control, Intelligent Systems and Robotics Area, and Head of Control Science Group, NUS Temasek Laboratories. His current research interests are in unmanned systems, robust control and control

applications.

Dr. Chen is an IEEE Fellow. He has authored/co-authored more than 400 journal and conference articles, and a dozen research monographs in control theory and applications, unmanned systems and financial market modeling by Springer in New York and London. He had served on the editorial boards of several international journals including IEEE Transactions on Automatic Control and Automatica. He currently serves as an Editor-in-Chief of Unmanned Systems. Dr. Chen has received a number of research awards nationally and internationally. His research team has actively participated in international UAV competitions, and won many championships in the contests.

Panelists

We introduce our panelists in the alphabetic order as follows.

Professor Bor-Chin Chang, Drexel University, USA

Professor Bor-Chin Chang received his BS Degree in Control Engineering from National Chiao-Tung University, Hsinchu, Taiwan, in 1969, MS Degree in Electrical Engineering at National Taiwan University, Taipei, Taiwan, in 1972, and PhD Degree in Electric Engineering from Rice University in Houston, Texas, in 1983. Between 1983 and 1987, he was with Bradley University in Peoria, Illinois, and since 1987 he has been with Drexel University, Philadelphia, Pennsylvania, where he currently is a Professor in Mechanical Engineering.

Dr. Chang was one of the main contributors of the development of H-infinity control theory in early 1980s. He was a co-recipient with Dr. J. B. Pearson of the IEEE Transactions on Automatic Control Best Paper Award in 1985 for their contribution in optimal disturbance reduction in linear multivariable systems. He was also one of the pioneers working on flight safety issues from control system design perspectives since late 80s.

Dr. Chang's current research interests include

control of nonlinear systems with uncertainties, controller reconfiguration for actuator/sensor failures, real-time embedded microprocessor control, loss-of-control prevention and upset recovery for aircraft, control of flying munitions, etc. He has been involved in funded research projects sponsored by NSF, AFOSR, Air Force Research Laboratory, NASA Langley Research Center, Army Research Laboratory, the Boeing Company, Association of Iron and Steel Engineers, and Ben Franklin Partnership Program of the Commonwealth of Pennsylvania, etc.

Professor Michael J. Grimble, University of Strathclyde, Scotland, UK

Professor Michael J. Grimble was appointed as a Professor of Industrial Systems at the University of Strathclyde, Glasgow, in 1981, and shortly after he established the Industrial Control Centre. He is currently a research professor and is the Managing Editor of the Wiley journals on Robust and Nonlinear Control, Adaptive Control and Signal Processing and Optimal Control Applications and Methods. He was recently appointed the editor of new Wiley journal on Advanced Control Applications. He is a joint editor of the Springer Monograph Series on Advances in Industrial Control and of the series on Advanced Textbooks on Control and Signal Processing.

He established a company Industrial Systems and Control Limited three decades ago, that works across industrial sectors, for which he acts as the Technical Director and Deputy Chairman. He became a Fellow and Chartered Engineer for the Institution of Electrical Engineers in 1974, Fellow, and Chartered Mathematician of the Institute of Mathematics and its Applications in 1982. He was awarded an IEEE Fellowship in 1992. He became a founder member, and the first Chairman of the IEEE Control Systems Society, UK and Ireland Control Systems Chapter, in 1975. He became a Fellow of the Institute of Measurement and Control in 1990. He was appointed a Fellow of the Royal Society of Edinburgh in 1999.

Professor Clara Ionescu, Ghent University, Belgium

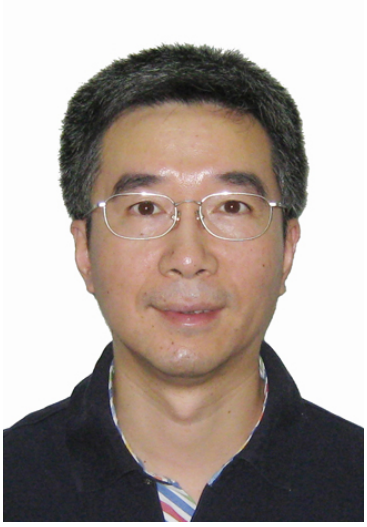
Professor Clara Ionescu received the M.Sc. degree in industrial informatics and automation from the Dunarea de Jos University of Galati, Romania, in 2003, and the Ph.D. degree from Ghent University, Belgium, in 2009 on using fractional calculus tools to model dynamical systems. Between 2011 and 2016 she was the recipient of the prestigious Flanders Research Fund grant for post-doctoral fellows at the same university.

She has more than 200 peer reviewed scientific publications, an h-index of 20 and author of one monograph and two books in series collection (Elsevier and Springer). Since October 2016 she is professor at Ghent University, teaching Computer Control of Industrial Processes within the Control and Automation Master Program. Her current research interests include technical and biomedical applications, with identification and advanced control objectives.

In October 2017, she won the Best Paper Award from the IEEE 21st International Conference on Intelligent Engineering Systems on a paper describing the paradigm and challenges thereof computer based guided closed loop control for anesthesia. Since 2017 she is member of the Belgian Task Force on Smart Mobility Plan where a part of her heterogeneous network control research is applied for Emergency Medicine (Automated Unmanned Aerial Vehicle for Emergency Resuscitation). During 2015 to 2017, she was involved in control design for Qinetiqs, a Belgian subcontractor for European Space Agency. In this project the tools from fractional calculus have been successful to tackle high-demand control specifications with robustness in spacecraft mechatronic applications for automatic control/maneuvers.

She is a member of the IFAC Task Force on Diversity and Inclusion, and an acknowledged role-model for female control engineers. She is a member of the IFAC TCs of Control Education, Control Design and Medical and Biological Systems. She is a member of the IEEE TCs on Control Systems Society, System Identification

and Adaptive Control, Healthcare Technology and Medicine, Standards, Systems Man and Cybernetics and co-founder of Cyber Medical Systems Society.



Professor Zidong Wang, Brunel University London, England, UK

Professor Zidong Wang is an IEEE Fellow and Professor of Computing at Brunel University London with research interests in intelligent data analysis, statistical signal processing as well as dynamic systems and control. He has been named as the Hottest Scientific Researcher in 2012 in the area of Big Data Analysis. He has been listed as a Highly Cited Researcher in both computer science and engineering science for five consecutive years 2014-2018. He was awarded the AvH Research Fellowship in 1996 from the Alexander von Humboldt Foundation of Germany, the JSPS Research Fellowship in 1998 from the Japan Society for the Promotion of Science and the William Mong Distinguished Research Fellowship in 2002 from the University of Hong Kong.

Since 1997, He has published around 220+ papers in IEEE Transactions and 60+ papers in Automatica with an h-index of 110 according to Google Scholar. He is currently serving as the Editor-in-Chief for Neurocomputing, the Deputy Editor-in-Chief for International Journal of Systems Science and an Associate Editor for 10 prestigious journals including 5 IEEE Transactions. His research has been funded by the EU, the Royal Society and the EPSRC of the UK.