Plenary Panel Session

Trends of Nonlinear Control and Its Applications

Time:	4:00–6:00pm, July 4, 2017
Venue:	Biljana Hall, Hotel Metropol
Chairs:	Professor Jie Chen, Beijing Institute of Technology, China Professor Ben M. Chen, National University of Singapore
Panelists:	Professor Xiang Chen, University of Windsor, Canada Professor Georgi M. Dimirovski, Dogus University of Istanbul, Turkey Professor Jie Huang, Chinese University of Hong Kong Professor Claude Martinez, Institute of Technology, University of Nantes, France Professor Houria Siguerdidjane, CentraleSupelec, France

The theme of the IEEE ICCA plenary session this year is on *Trends of Nonlinear Control and Its Applications*. We are honored that five prominent educators and researchers have accepted to join this panel and to share their expertise and visions about a number of challenges and opportunities in the field of nonlinear systems and nonlinear control, or in the field of control and automation in general. Through direct contact with world-renowned experts and active participation of the audience, we would expect to gain a deeper insight into some fundamental and emerging problems in the field. This panel will also serve as a platform for the audience, in particular junior researchers and students, to hear what experts might think about issues often facing us at the early stage of our career or study.

The biographies of the panelists are listed below in an alphabetic order.

Professor Xiang Chen received his PhD in Systems and Control from Louisiana State University in 1998. Since 2000, he has held cross-appointed faculty position with the Department of Electrical and Computer Engineering and the Department of Mechanical, Automotive and Materials Engineering at the University of Windsor and is currently a Professor in the Department of Electrical and Computer Engineering. He has made fundamental contribution to Gaussian filtering and control and to the control of nonlinear systems with bifurcation. Since 2000, he has also made significant contribution to industrial applications of control and optimization in automotive systems and in visual sensing systems through extensive collaboration with automotive and manufacturing industries in both Canada and USA. Several deliverables have been transferred into relevant companies' products or used in practical operations.

He is currently an Associate Editor for SIAM Journal on Control and Optimization and a Technical Editor for IEEE/ASME Transaction on Mechatronics. His research has been well supported by grants or contracts from government agencies at both federal and provincial levels in Canada and from industrial companies in both Canada and USA. He received the New Opportunity Award from Canadian Foundation of Innovation and from Ontario Centre of Excellence—Materials and Manufacturing Ontario in Canada. He also received several Research Excellence Awards from the University of Windsor. His current research interests include networked control of systems with complexities, automotive control and optimization, and field sensor network for autonomous applications. He is a registered Professional Engineer in Ontario, Canada.

Professor Georgi M. Dimirovski received his Dipl.-Ing. in Electrical Engineering from St. Cyril & St. Methodius University of Skopje, Macedonia, his M.Sc. in Electrical & Electronic Engineering from the University of Belgrade, Serbia, and his PhD in Automatic Control from the University of Bradford, UK. He is currently a Research Professor of Automation & Systems Engineering at the University St. Cyril and St. Methodius of Skopje, Macedonia, and a foreign Guest Professor of Computer & Control Sciences at Dogus University of Istanbul, Turkey, as well as 'Pro Universitas' Professor of Obuda University in Budapest, Hungary. He was a Visiting Professor at

the Free University of Brussels, Belgium, a Visiting Professor at Johannes Kepler University of Linz. He has also been teaching to graduate on summer schools at universities in Dalian, Nanjing, Shanghai, and Shenyang in China.

His research interests are on complex dynamic networks and systems, fuzzy-logic and neural-network topics of applied computational intelligence, and switched systems and switching control. He served on the Executive Council of the European Science Foundation (ESF) during 1989–1993, and on the Technical Board of the International Federation of Automatic Control (IFAC) during 2005–2011. He has served as an associate editor for several international journals. He has received a number of international awards including the 2009 IET Premium Award from the UK Institution of Engineering & Technology for the best paper published in *IET Control Theory & Applications* in 2008, and IFAC Outstanding Service Award in 2011. He served three terms as the President of former Yugoslav Society for Electronics, Telecommunications, Automation, and Nuclear Engineering (ETAN) (before the 1991), and several terms as the President of the Society for Electronics, Telecommunications, Automatics and Informatics (ETAI), Macedonia, which he founded in 1981 along with a group of colleagues. Professor Dimirovski is Member of the European Academy of Science and Arts (EASA) in Salzburg, Austria, and a Foreign Member of Academy of Engineering Sciences in Belgrade, Serbia.

Professor Jie Huang completed his Ph.D. study in automatic control at the Johns Hopkins University in 1990 and subsequently held a post-doctoral fellow position there until July 1991. From August 1991 to July 1995, he worked in industry in USA. He joined the Department of Mechanical and Automation Engineering, the Chinese University of Hong Kong (CUHK), in 1995, and is now Choh-Ming Li Professor of Mechanical and Automation Engineering and the Chairman of the Department of Mechanical and Automation Engineering, CUHK. His research interests include control theory and applications, robotics and automation, neural networks and systems biology, and guidance and control of flight vehicles. He received the State Natural Science Prize, Class II, in 2011, Croucher Senior Research Fellowship award in 2006, the best paper award of the 8th International Conference on Control, Automation, Robotics, and Vision in 2004, and the SUPCON Best Paper Award of the 9th World Congress on Intelligent Control & Automation in 2012. He was elected CAA Fellow in 2010, IFAC Fellow in 2009, and IEEE Fellow in 2005.

Professor Jie Huang is an Editor-at-Large of *Communications in Information and Systems*, Member of the Advisory Board of *Transactions of the Institute of Measurement and Control*, and Subject Editor of *International Journal of Robust and Nonlinear Control*, and Associate Editor of *Science in China, Series F: Information Sciences* and *ACTA Automatica Sinica*. He served as Associate Editor of *IEEE Transactions on Automatic Control* from 2002 to 2004, and an Associate Editor of the *Asian Journal of Control* from 1999 to 2001. He has been Guest Editor for *IEEE Transactions on Neural Networks*, *International Journal of Robust and Nonlinear Control*, and *Asian Journal of Control*. He was a Distinguished Lecturer of IEEE Control Systems Society from 2005 to 2008, and member of the Board of Governors of IEEE Control Systems Society from 2006 to 2007.

Professor Claude Martinez is currently with the Institute of Technology, University of Nantes, France, he is also member of the PSI research team (formerly ACSED, Analysis and Control of Discrete Event Systems) at the LS2N (Nantes Laboratory of Numerical Sciences, formerly IRCCyN, Research Institute on Communication and Cybernetics in Nantes). Professor Martinez has directed the LERTI (Research Laboratory in Industrial Techniques) at the Abomey Calavi University in Benin from 2001 to 2005. He has been the head of QLIO department from 2012 to 2015.

His research concerns principally the control of discrete event systems, particularly those that are subject to strict time constraints, with a strong orientation to production systems applications. Dr. Martinez joined, as an invited researcher, in 2011–2012, the DAS (Departamento de Automação e Sistemas), Universidade Federal de Santa Catarina in Brazil. Since 2011, He has explored the use of controlled invariance theory in idempotent semi-rings to tackle constraints meeting problem in discrete event systems.

Professor Houria Siguerdidjane is a Professor and Deputy Director of Research at CentraleSupelec. Her teaching activity at the Automatic Control Department and research interests at the Signals and Systems Laboratory (L2S) include linear and nonlinear control systems and applications to aerospace, mechanical and power systems problems. She is an Associate Editor of the IFAC Journal *Control Engineering Practice* and for the actual triennial, she is the Vice-Chair of the IFAC Aerospace Technical Committee and nominated as member of the IFAC Policy Committee.

She obtained an Engineering degree from Supélec (now CentraleSupélec). She received the Doctorate degree in Automatic Control and Signal Processing in 1985 and the Habilitation degree in Physics Sciences from University Paris XI (in 1998). She held an AVH Fellowship for a post-doctoral position (in 1989) in the Department of Mathematics at Munich Technical University where her main project concerned the optimization of aircrafts trajectories.

In 1994–1995, she was on sabbatical leave at the industrial company AlstomT&D, where her main interest was the application of new concepts to improve the relaying protection performance in high voltage electrical networks. Prof. Siguerdidjane has been serving, as the Chair of the IFAC Aerospace Technical Committee from 2006 to 2014. She is recipient of the 2012 IFAC-France Award. In 2013, she was also Director Deputy of Research and Industrial Partnerships of CentraleSupélec-Metz Campus.

Biographies of the panel session chairs:

Professor Jie Chen is currently the Vice President of Beijing Institute of Technology, 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-Present), the Managing Editor for the *Journal of Systems Science and Complexity* (2014-present), and Editorial Board Member and associate editor for many international journals.

His main research interests include multi-objective optimization and decision-making of complex system, intelligent control, constrained nonlinear control, and optimization methods. He has authored/co-authored 3 monographs and more than 100 research papers. He also holds 56 patents of invention. He is a Distinguished Young Scholar honored by NSFC and a Changjiang Scholar Distinguished Professor awarded by the Ministry of Education China. He is also a senior member of IEEE. 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 is a Professor and Provost's Chair in the Department of Electrical and Computer Engineering, National University of Singapore. He is also serving as the Director of Control, Intelligent Systems and Robotics Area. His current research interests are in the development of unmanned aerial systems, and financial market modeling.

He has published 10 research monographs including H_2 *Optimal Control* (Prentice Hall, 1995), *Robust and* H_∞ *Control* (Springer, 2000), *Hard Disk Drive Servo Systems* (Springer, 1st Edition, 2002; 2nd Edition, 2006), *Linear Systems Theory* (Birkhäuser, 2004), *Unmanned Rotorcraft Systems* (Springer, 2011), and *Stock Market Modeling and Forecasting* (Springer, 2013). He had served on the editorial boards of a number of journals including *IEEE Transactions on Automatic Control*, *Systems & Control Letters,* and *Automatica*. He currently serves as an Editor-in-Chief of *Unmanned Systems* and a Deputy Editor-in-Chief of *Control Theory & Technology*. Dr. Chen is an IEEE Fellow.