Colloquia *Roberto Tempo* in Automatica

The **Colloquia Roberto Tempo in Automatica** are dedicated to the memory of our friend and colleague Roberto, who passed away suddenly in 2017 during a ski mountaineering trip in the Alps. Roberto always believed in importance of sharing and disseminating results in his community.

Roberto was an extraordinary communicator. His talks were always clear and highly inspiring. As an author of scientific contributions, he spent an incredible amount of time making sure that his papers were accurate and easily accessible.

The colloquia are general seminars held by renowned scientists. They range over all aspects of systems and control, and on interdisciplinary subjects where control plays a fundamental role. They aim to contribute at the cultural atmosphere of our Institute, so offering young people the opportunity to be exposed to the teaching of internationally known scholars working in different research areas.

The colloquia are organized by the Systems Modeling and Control (SMC) group of IEIIT CNR. To allow a broader audience to attend the seminar, they will be streamed online. Starting this year, the colloquia are co-sponsored by the Italian Chapters of the **IEEE Control Systems Society**, the **IEEE Robotics & Automation Society**, the **IEEE Power & Energy Society**, and the **IEEE PoliTo Student Branch.**

The second colloquium will be held on April 12 by Prof. **Francesco Bullo**, of the University of California, Santa Barbara. A light buffet (aperitivo) will be offered after the Colloquium.
To register to the event: https://colloquia-roberto-tempo.eventbrite.com

Colloquia organizing committe:
Prof. Sergio Bittanti, Prof. Patrizio Colaneri, Dr. Fabrizio Dabbene

2ⁿᵈ Colloquium Roberto Tempo on Automatica

Francesco Bullo, University of California, Santa Barbara
Network Systems: Theory and Applications to Synchronous Power Flows
April 12, 2019 – 11:00
Sala Consiglio di Facoltà – Politecnico di Torino
Registration: colloquia-roberto-tempo.eventbrite.com – Youtube Streaming will be available

Abstract. Network systems are mathematical models for the study of cooperation, propagation, synchronization and other dynamical phenomena that arise among interconnected agents. Network systems are widespread in science as they are fundamental modeling tools, e.g., in sociology and epidemiology. They also play a key growing role in technology, e.g., in the design of power grids, cooperative robotic behaviors and distributed computing algorithms. Their study pervades applied mathematics.

This talk will review established and emerging frameworks for modeling, analysis and design of network systems. I will survey the available comprehensive theory for linear network systems and then highlight selected nonlinear concepts. Next, I will focus on recent developments by my group on a rigorous and comprehensive framework for the analysis of security, transmission capacity, and multistability for active power flow in power networks.

Biographical Sketch. Francesco Bullo is a Professor in the Mechanical Engineering Department at the University of California, Santa Barbara. He received the Laurea degree "summa cum laude" in Electrical Engineering from the University of Padova, Italy, in 1994, and the Ph.D. degree in Control and Dynamical Systems from the California Institute of Technology in 1999. From 1998 to 2004, he was an Assistant Professor with the Coordinated Science Laboratory at the University of Illinois at Urbana-Champaign. Since 2004 he has been at University of California, Santa Barbara; he is currently affiliated with the Department of Electrical and Computer Engineering, the Department of Computer Science, and the Center for Control, Dynamical Systems and Computation.

His research interests focus on network systems and distributed control with application to robotic coordination, power grids and social networks. He is the coauthor of "Geometric Control of Mechanical Systems" (Springer, 2004) and "Distributed Control of Robotic Networks" (Princeton, 2009); his "Lectures on Network Systems" (CreateSpace, 2018) is available on his website.

Professor Bullo is a Fellow of IEEE and IFAC. He is currently a Distinguished Lecturer of the IEEE Control Systems Society. He received the 2018 Distinguished Scientist Award by the Chinese Academy of Sciences. His articles received the 2008 CSM Outstanding Paper Award from IEEE CSS, the 2011 Hugo Schuck Best Paper Award from AACC, the 2013 SIAG/CST Best Paper Prize from SIAM, the 2014 Automatica Best Paper Prize from IFAC, the 2016 Guillemin-Cauer Best Paper Award from IEEE CAS, and the 2016 TCNS Outstanding Paper Award from IEEE CSS. Professor Bullo served as advisor or co-advisor of 22 graduated PhD students. He received the 2015 UCSB Outstanding Graduate Mentor Award and the 2004 UIUC COE Outstanding Advisor Award. His students' papers were finalists for the Best Student Paper Award at the IEEE Conference on Decision and Control (2002, 2005, 2007), and the American Control Conference (2005, 2006, 2010).

Professor Bullo has served, for the IEEE Control Systems Society, as 2011-2012 Vice-President for Technical Activities, as 2013-2014 Vice-President for Publications, as 2007-2009 Elected Member of the Board of Governors and as Program Chair for the 2016 IEEE Conference in Decision and Control. He is serving as President Elect / President / President Past of the IEEE Control Systems Society during the triennium 2017–2019. Additionally, he served on the Editorial Boards of "IEEE Transactions on Automatic Control," "ESAIM: Control, Optimization, and the Calculus of Variations," "SIAM Journal of Control and Optimization," and "Mathematics of Control, Signals, and Systems".