



## CHEMICAL ENGINEERING 290 SEMINAR SERIES PRESENTS

Prof. Francesco Bullo

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Department of Mechanical Engineering

### *Network Systems in Science and Technology*



4pm - Thursday, May 12th 2016 in ENGR II room 1519

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, ecology, 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 the evolution of opinions and social power in social networks and the analysis of security and transmission capacity in power grids.

**Francesco Bullo** is a Professor with the Mechanical Engineering Department and the Center for Control, Dynamical Systems and Computation at UC Santa Barbara. He was previously associated with the University of Padova, the California Institute of Technology and the University of Illinois at Urbana-Champaign. His main research interests are 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 articles received the 2008 IEEE CSM Outstanding Paper Award, the 2010 Hugo Schuck Best Paper Award, the 2013 SIAG/CST Best Paper Prize, and the 2014 Automatica Best Paper Award. He is currently serving as Chair of the Mechanical Engineering Department at UCSB and has served as Vice-President for Technical Activities and for Publications for the IEEE Control Systems Society.

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