



Control Optimization and Robotics Group



**Università del Salento
Lecce (Italy)**

2009 seminar series

presents

Geometry, optimization and control in robot coordination

Professor Francesco Bullo

University of California at Santa Barbara

Tuesday, July 21st 2009, 12.00pm - 1.00pm,

Aula Magna Facoltà di Ingegneria, Edificio Rizzo (Aula Y1)

Abstract:

Motion coordination is an extraordinary phenomenon in biological systems and a powerful tool in man-made systems; although individual agents have no global system knowledge, complex behaviors emerge from local interactions. This talk focuses on robotic networks, that is, group of robots that communicate and coordinate their motions to perform useful tasks. Example tasks are how to respond to service requests in an environment, how to deploy sensor nodes in locations of interest, and how to partition an environment among cooperating agents. For these tasks, we propose a comprehensive collection of adaptive and distributed algorithms, including a novel deployment and partitioning algorithm with minimal communication requirements. Our approach integrates concepts from queuing and stochastic analysis, geometric optimization, and nonlinear stability theory.

About the speaker:

Francesco Bullo received the Laurea degree in Electrical Engineering from the University of Padova 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 affiliated with the University of Illinois at Urbana-Champaign. He is currently a Professor with the Mechanical Engineering Department at the University of California, Santa Barbara. He is the coauthor of the book "Geometric Control of Mechanical Systems" (Springer, 2004) and of the book "Distributed Control of Robotic Networks" (Princeton, 2009). His research interests include cooperative control, vehicle routing, and motion planning for autonomous robots, as well as geometric control of mechanical systems.

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