



University of Pavia

Ph.D. School of Electrical and Electronic Engineering and Computer Science

SEMINAR

Multiplexed Model Predictive Control

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30th June 2011, h 14:15 - 15:15

Conference room – Dept. of Computer Engineering and Systems Science
Floor D

Abstract: This talk describes a form of Model Predictive Control (MPC) in which the control variables are moved asynchronously. This contrasts with most MIMO control schemes, which assume that all variables are updated simultaneously. MPC requires on-line optimization, hence computational complexity can become an issue when applying MPC to complex systems with fast response times. The multiplexed MPC scheme described in this talk solves the MPC problem for each subsystem sequentially, and updates subsystem controls as soon as the solution is available, thus distributing the control moves over a complete update cycle. The resulting computational speed-up allows faster response to disturbances, which may result in improved performance, despite finding sub-optimal solutions to the original problem. Multiplexed MPC provides a natural form of distributed MPC in some applications, as will be illustrated on an air-traffic management example.

Bio: Jan Maciejowski is a Professor of Control Engineering in the Department of Engineering at the University of Cambridge, England. He is Head of the Information Engineering Division, and a member of the Control Group. He is also the President and a Fellow of Pembroke College, Cambridge. He is a member of the IETs Sector Panel for Innovation and Emerging Technologies. He was the President of the European Union Control Association from 2003 to 2005, and was President of the Institute of Measurement and Control for 2002. He is a Chartered Engineer and a Fellow of the Institution of Engineering and Technology (IET), the Institute of Electrical and Electronic Engineers(IEEE), and the Institute of Measurement and Control (InstMC). He was a Distinguished Lecturer of the IEEE Control Systems Society from 2001 to 2007.

Research Overview: Fault-tolerant control, Control of autonomous systems, Model predictive control, System identification.

Organizer

Prof. L. Magni

Ph.D. Coordinator

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