OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

MAGDEBURG LECTURES ON OPTIMIZATION AND CONTROL

Prof. Carsten W. Scherer

From Gain-Scheduling to Distributed Control

Time & Place
The presentation on June 16, 2014 will be given at the Otto-von-Guericke-Universität Magdeburg, Universitätsplatz 2, building 03 - room 106 and starts at 4.45 p.m.

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Abstract
Linear parameter varying (LPV) systems are described by linear dierential equations whose describing matrices depend on time-varying parameters. The goal in synthesis is to design a controller of the very same structure such that the overall controlled system satises certain desired specications on stability and performance for the entire set of permissible parameter trajectories. The implementation of LPV controllers takes on-line measurements of the time-varying parameters into account in order to improve the performance over robust controllers, compensators without any adaptation capabilities.
In this talk we highlight the challenges in synthesizing controller in order to meet certain desired stability and performance properties. Furthermore, we address a long-standing open problem in robust control and present novel algorithms that allow to systematically reduce conservatism by relying on frequency-dependent stability multipliers. In the nal part of the talk we reveal how the developed framework enables the design of distributed controllers for spatially interconnected systems with reduced conservatism.

Short CV
Carsten W. Scherer received his Ph.D. degree in mathematics from the University of Würzburg (Germany) in 1991. After six months of research at the University of Groningen (The Netherlands), the University of Michigan (Ann Arbor) and Washington University (St. Louis) respectively, Dr. Scherer joined Delft University of Technology (The Netherlands) in 1993 where he held positions as an assistant and associate professor. In fall 1999 he spent a three months sabbatical as a visiting professor at the Automatic Control Laboratory of ETH Zurich. From December 2001 until February 2010 he was a full professor within the Delft Center for Systems and Control at Delft University of Technology. Since March 2010 he holds the SRC SimTech Chair Mathematical Systems Theory in the Department of Mathematics at the University of Stuttgart in Germany.
His main research interests cover various topics in applying optimization techniques for developing new advanced controller design algorithms and their application to mechatronics and aerospace systems. Dr. Scherer acted as the chair of the IFAC technical committee on Robust Control (2002-2008), and he has served as an associated editor for IEEE Transactions on Automatic Control (1997-1999), Automatica (2000-2006) and Systems and Control Letters; he is currently active on the editorial board of the European Journal of Control and various control conferences.