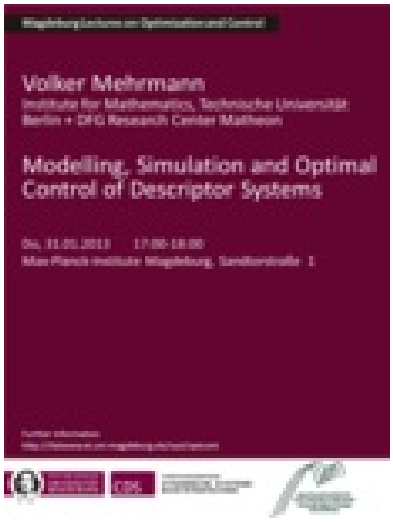
OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

MAGDEBURG LECTURES ON OPTIMIZATION AND CONTROL

Volker Mehrmann



Modelling, Simulation and Optimal Control of Descriptor Systems

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Time & Place

The presentation will be given on January 31, 2013 at 5 p.m. and takes place at the ›Max Planck Institute, V0.05/2-3 (http://www.mpi-magdeburg.mpg.de/institute/way.en.html)

Abstract

Automated modeling of dynamical systems has reached a very high level of maturity. Unfortunately the resulting models are not always well suited for numerical simulation, control or optimization. As a consequence typically a remodeling has to be carried out to use classical simulation, optimization and control tools in a reliable and satisfactory way. We present a remodeling concept that creates, from a given automatically generated model (including over- and under-determined systems), a new system which is provably well suited for simulation, control and optimization, but has the same solution set. In particular all the variables keep their physical meaning. We demonstrate the advantages of the new approach and also present some of the current challenges.

Short CV

Volker Mehrmann received his Diploma in mathematics in 1979, his Ph.D. in 1982, and his habilitation in 1987 from the University of Bielefeld, Germany. He spent research years at Kent State University in 1979-1980, at the University of Wisconsin in 1984-1985, and at IBM Research Center in Heidelberg in 1988-1989. After spending the years 1990-1992 as a visiting full professor at the RWTH Aachen, he was a full professor at Chemnitz University of Technology from 1993 to 2000. Since then he has been a full professor for Mathematics at TU Berlin.
He is a member of acatech (the German academy of engineering) and president of GAMM (International Association of Applied Mathematics and Mechanics). His research interests are in the areas of numerical mathematics/scientific computing, applied and numerical linear algebra, control theory, and the theory and numerical solution of differential-algebraic equations. He is editor-in-chief of Linear Algebra and its Applications and he is Chairman of MATHEON, the DFG Research Center "Mathematics for key technologies" in Berlin as the GAMM, the "Gesellschaft für Angewandte Mathematik und Mechanik. He is the author and co-author of 5 monographs and textbooks, has (co-)edited 5 books and (co-)authored more than 160 articles in peer-reviewd scientific journals.