Kolloquium

ALGORITHMIC OPTIMIZATION

Im Rahmen des Kolloquiums des
Graduiertenkollegs Algorithmic Optimization
findet am

Montag, 18. April 2016
16 h c.t.
Hörsaal 10

folgender Vortrag statt:

Optimal model reduction: An interpolation framework

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Abstract

Numerical simulation of large-scale dynamical systems plays a crucial role and may be the only possibility in studying a great variety of complex physical phenomena with applications ranging from heat transfer to fluid dynamics, to
signal propagation and interference in electronic circuits, and many more. However these large-scale dynamical systems present significant computational difficulties when used in numerical simulation. Model reduction
aims to reduce this computational burden by constructing simpler (reduced order) models, which are much easier and faster to simulate yet accurately represent the original system. These simpler reduced order models can then serve as efficient surrogates for the original, replacing them as components in larger systems; facilitating rapid development of controllers for real time applications; enabling optimal system design and uncertainty analysis.

In this talk, we will first review optimal model reduction of linear dynamical systems by using rational interpolation as the underlying framework. The concept of transfer function will prove fundamental in this setting. We will discuss how interpolation, consequently model reduction, can be performed optimally in an appropriate system norm. We will also discuss extending the interpolation framework to parametric dynamical systems and illustrate an example arising in nonlinear inversion. Finally, we will show how the concept of interpolation can be extended to special nonlinear dynamics, allowing us to construct input-independent reduced models in this setting as well.

Gastgeber:
Prof. Dr. Ekkehard Sachs

Kolloquiums Kaffee ab 15.45 im Raum E 10