A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Dienstag, 20. Januar 2015, 10.00 Uhr

Ort: ZIB Seminarraum (Raumnr. 2006)
Konrad-Zuse-Zentrum für Informationstechnik Berlin
Takustraße 7, 14195 Berlin

Disputation über die Doktorarbeit von

Herrn Sebastian Götschel

Thema der Dissertation:
Adaptive Lossy Trajectory Compression for Optimal Control of Parabolic PDEs

Thema der Disputation:
Model Reduction Techniques for PDE Constrained Optimization

Die Arbeit wurde unter der Betreuung von **Prof. Dr. Dr. h.c. P. Deuflhard** durchgeführt.

Abstract: Optimal control of systems governed by parabolic partial differential equations has become an important tool in many application fields. Solving such optimization problems typically requires numerous solutions of the state and adjoint equations. Model order reduction can help to reduce the computational effort significantly.

The main focus of this talk will be on proper orthogonal decomposition (POD), a widely used and very competitive model reduction technique for nonlinear optimal control problems. There, a basis is constructed from solution snapshots at certain time-instances, which then is used for a Galerkin discretization of the differential equations. We discuss the construction of the POD basis for parabolic equations, and investigate the error between the exact solution of the state equation and its POD approximation. For optimal control problems, only sub-optimal controls can be computed when model reduction is used. We present an a-posteriori error estimator to control the error in the computed solutions, and give numerical examples.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. Dr. h.c. P. Deuflhard