

A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Montag, 18. Juli 2016, 10.00 Uhr

Ort: Seminarraum SR 108/109, Arnimallee 6, 14195 Berlin

Disputation über die Doktorarbeit von

Herrn Adnan Farhan Sulaiman Daraghme

Thema der Dissertation und der Disputation:

**Model Order Reduction of Linear Control Systems:
Comparison of Balance Truncation
and Singular Perturbation Approximation
with Application to Optimal Control**

Die Arbeit wurde unter der Betreuung von **Prof. Dr. C. Hartmann** durchgeführt.

Abstract: There are a number of techniques to reduce the order of finite dimensional linear time-invariant systems. The general idea of balanced model reduction is to restrict a system to the subspace of easily controllable and observable states which can be determined by the Hankel singular values associated with the system. It can be shown that both balanced truncation and singular perturbation methods give the same upper error bound, where balanced truncation yields a smaller error at high frequencies and tend to be larger at low frequencies, whereas the singular perturbation approximation behaves in the opposite way. The talk will review balanced model reduction and explain the main differences between approximations based on truncation and the singular perturbation approximation.

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. C. Hartmann