

FREIE UNIVERSITÄT BERLIN Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Mittwoch, 18. Mai 2016, 12.00 Uhr

Ort: Raum 025/026, Arnimallee 6, 14195 Berlin

Disputation über die Doktorarbeit von

Herrn Jonathan William Youett

Thema der Dissertation:

**Dynamic large deformation contact problems
and applications in virtual medicine**

Thema der Disputation:

Reduced Basis Methods for Parametric PDEs

Die Arbeit wurde unter der Betreuung von **Prof. Dr. R. Kornhuber** durchgeführt.

Abstract: Nowadays, many applications in computational engineering like optimal design or statistical problems require the frequent numerical solution of parametric partial differential equations (PDE) with a very high resolution, i.e. with small discretisation error.

Within this context the reduced basis method provides a way to speed-up these costly solutions up-to real-time computation time.

The key observation behind it, is that the parametric solutions are not arbitrary elements of an infinite dimensional function space but reside in the typically much lower-dimensional and compact solution manifold.

This manifold in turn is often “well-behaved” and can be approximated by a small number of carefully selected parametric solutions, called “snapshots”.

In this talk I will introduce the reduced basis method for elliptic partial differential equations and describe the a priori convergence analysis in terms of the Kolmogorov width.

Further, I will give an overview over the important numerical aspects of this approach, like the selection strategy for the snapshot and the affine parametric decomposition, which is necessary for an optimal speed-up of the method.

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. R. Kornhuber