UNIVERSITÄT DES SAARLANDES
Fakultät für Mathematik und Informatik
Fachrichtung Mathematik

Mathematisches Kolloquium

Am Freitag, dem 14. Januar 2022, spricht um 14 Uhr c.t. via Zoom

Prof. Dr. Mario Ohlberger
Universität Münster,

über das Thema:

(Localized) Model Reduction with Adaptive Enrichment for PDE Constrained Optimization

Abstract:
Model order reduction is a very active research field that has seen tremendous development in recent years, both from a theoretical and application point of view. A particular promising model reduction approach for parameterized partial differential equations (pPDEs) is the Reduced Basis (RB) Method that relies on the approximation of the solution manifold of pPDEs by low dimensional linear spaces that are spanned from suitably selected particular solutions, called snapshots. While RB methods are meanwhile very well established and analyzed for scalar coercive problems, there are still major challenges for problems with a slow convergence of the Kolmogorov N-width. Particular promising approaches for high dimensional parameter dependence or for multiscale problems are localized model reduction approaches. Based on efficient a posteriori error control and online enrichment, these methods overcome traditional offline/online splitting and are thus particularly well suited for applications in optimization or inverse problems. In this talk we investigate model reduction with adaptive basis enrichment within an Trust Region – RB approach that updates the reduced model during the trust region iterations. We discuss a posteriori error estimation, convergence of the overall method as well as numerical experiments that demonstrate the efficiency of the approach.
This is joint work with Tim Keil, Luca Mechelli, Felix Schindler, Stephan Rave, and Stefan Volkwein.

Der Gast wird von Prof. Dr. Thomas Schuster betreut.
Alle Interessenten und Interessentinnen sind zum Vortrag herzlich eingeladen. Der Vortrag findet als Zoom-Konferenz statt.

Die Dozenten der Mathematik