Universität Konstanz

Fachbereich Mathematik und Statistik

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Wir laden recht herzlich zu einem Vortrag im Rahmen des

Oberseminars Numerische Optimierung

ein:

Dr. Benjamin Unger

(University of Stuttgart)

Structure-Preserving Model-Order Reduction for Port-Hamiltonian Systems

Dienstag, 26. Januar 2021

Beginn: **16:00 Uhr**
Raum: **BigBlueButton** `https://bbb.uni-konstanz.de/b/gab-nez-v4u`
Interessenten sind herzlich willkommen!

S. Volkwein, G. Ciaramella

Abstract:

In a rapid equation-based development environment and future high-tech initiatives in systems engineering, such as digital twin, mathematical models must meet several requirements. For instance, a bottom-up modeling approach requires the coupling of models across different scales and physical domains while maintaining system properties, such as stability of passivity. One modeling paradigm meeting these requirements is the port-Hamiltonian (pH) framework, which constitutes an innovative energy-based model paradigm that offers a systematic approach for the interactions of (physical) systems. In this talk, we discuss how to preserve the pH structure in a projection-based model reduction framework. We first examine the impact of state-space transformations on the approximation quality and then discuss a structure-preserving interpolatory method using spectral factors related to the Kalman-Yakubovich-Popov linear matrix inequality. We illustrate all findings with numerical examples.

(eingeladen von Prof. Dr. Stefan Volkwein)