

EINLADUNG

ZUM MATHEMATISCHEN KOLLOQUIUM

Es spricht

Herr Dr. Friedrich Philipp
(TU Ilmenau, Institut für Mathematik)

Zum Thema:

„Error bounds for kernel-based approximations of the Koopman operator“

Abstract:

We consider the data-driven approximation of the Koopman operator for stochastic differential equations on reproducing kernel Hilbert spaces (RKHS). Our focus is on the estimation error if the data are collected from long-term ergodic simulations. We derive both an exact expression for the variance of the kernel cross-covariance operator, measured in the Hilbert-Schmidt norm, and probabilistic bounds for the finite-data estimation error. Moreover, we derive a bound on the prediction error of observables in the RKHS using a finite Mercer series expansion. Further, assuming Koopman-invariance of the RKHS, we provide bounds on the full approximation error. Numerical experiments using the Ornstein-Uhlenbeck process illustrate our results. The talk is based on joint work with Manuel Schaller and Karl Worthmann (both TU Ilmenau) as well as Sebastian Peitz (Uni Paderborn) and Feliks Nüske (MPI Magdeburg).

Mittwoch, 08. Februar 2023, 17:00 Uhr, C 113

(Kaffee & Kekse, 16:30 Uhr, C 325)

Alle Interessierten sind herzlich eingeladen!

Ilmenau, 31.01.2023

Das Institut für Mathematik