



CSC Seminar

SPEAKER

Christof Schötz

PIK Potsdam

TITLE

Learning Ordinary Differential Equations from Noisy Data

ABSTRACT

We consider the task of learning the right-hand-side function f of an ordinary differential equation $u'=f(u)$ from observed (potentially noisy) data. Only nonrestrictive smoothness assumptions are imposed on f , so that any successful estimation procedure must be nonparametric. This problem is approached from two sides: statistical theory and a simulation study. In the theoretical part, we present different estimators for different settings that achieve the optimal minimax convergence rate, i.e., we show upper and lower bounds on the mean squared error for estimating f . In the simulation study, different approaches are applied to different (low-dimensional) dynamical systems, including chaotic and non-chaotic ones, and their performances are compared.

Tuesday, September 5, 2023 at 2 pm
seminar room Prigogine