Oberseminar Numerik

Frau Prof. Maria Han Veiga
(University of Michigan)

20.06.23
16:15 Uhr
Hilbertraum (05-432)
Staudingerweg 9, 55128 Mainz

„A new variable shape parameter strategy for radial basis function approximation using neural networks "

Abstract:

The choice of the shape parameter highly affects the behaviour of radial basis function (RBF) approximations, as it needs to be selected to balance between ill-condition of the interpolation matrix and high accuracy. In this work, we demonstrate how to use neural networks to determine the shape parameters in RBFs. In particular, we construct a multilayer perceptron trained using an unsupervised learning strategy, and use it to predict shape parameters for inverse multiquadric and Gaussian kernels. We test the neural network approach in RBF interpolation tasks and in a RBF-finite difference method in one and two-space dimensions, demonstrating promising results. In the second part of the seminar, I will talk about our novel algorithm in Reinforcement Learning, the Matryoshka Policy Gradient, and make links to the numerical solution of PDEs.

This is joint work with Fatemeh Nassajian Mojarrad, Jan S. Hesthaven and Philipp Öffner (part 1) and François Ged (part 2).

Hierzu sind alle herzlich eingeladen.

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