EINLADUNG

ZUM MATHEMATISCHEN KOLLOQUIUM

Es spricht

Herr Prof. Dr. Felix Voigtlaender

(Katholische Universität Eichstätt-Ingolstadt)

Zum Thema:

„Minimax rates for learning classification functions using neural networks"

Abstract: In the last years, Deep Learning has led to a number of breakthroughs; one important class of problems for which deep learning methods have been successfully applied are classification problems such as in image classification. In this talk, for a certain model class of classification problems, we analyze the (optimal) decay of the generalization error depending on the number of training samples. Precisely, we consider classification problems in which the decision boundary between the different classes has a given regularity, for instance $C ^ k$ regularity or Barron regularity. We then precisely determine (up to log factors) the minimax rates for learning an unknown function from this class based on \emph{noiseless} training samples, where we allow an arbitrary learning procedure, not necessarily based on neural networks. We furthermore show that these optimal rates are (essentially) attained by empirical Hinge-loss minimization over a class of ReLU networks of a suitable architecture. For classification functions with Barron-regular decision boundaries, the derived rates are dimension-independent, showing that ReLU networks can overcome the curse of dimension for these functions.

This is joint work with Philipp Petersen (University of Vienna).

Mittwoch, 4. Mai 2022, 17:00 Uhr, F-Hs im Faradaybau

Alle Interessierten sind herzlich eingeladen!

Ilmenau, 29.04.2022 Das Institut für Mathematik