Bernoullis Tafelrunde

Graduate Student Seminar

Monday, 28 March 2022, 12:15-13:00
Hybrid seminar
Seminar room 05.001, Spiegelgasse 5 / Zoom

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Exponential convergence rate in the approximation of analytic functions by deep neural networks.

Abstract

In this talk, we will show that for analytic functions, deep neural network approximation offers an exponential convergence rate. The present result will be of significance only in low dimension as the convergence rate deteriorates as a function of the dimensionality of the problem. To establish our result, we will construct neural networks with fixed width $d+4$ for functions in d dimension to approximate a large class of functions. For analytic functions, we show that the depth needed only depends on log $(1/\varepsilon)$ instead of ε itself where ε is the error tolerance.