

Higher Order Approximation Error Bounds for ReLU Neural Networks in Korobov Space



Invited Speaker

Yuwen Li

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Zoom Meeting: 756 768 6492

Biography

Yuwen Li received a bachelor's and master's degree from Nanjing University and a PhD in mathematics from University of California San Diego. He was a S. Chowla Assistant Research Professor at Penn State from 2019-2022. After that he became a faculty member of school of mathematical sciences at Zhejiang University. His main research areas include finite elements, model reduction, approximation theory. His research results have been published in SINUM, MathComp, FoCM, SISC, JCP etc.

Abstract

In this talk, I will present some results about the L_p and $W^{1,p}$ approximation error bounds of Korobov functions by deep ReLU neural networks. For target functions having a mixed derivative of fixed order in each direction, I will show nearly optimal approximation error bounds in terms of network width and depth. The key ingredients in our analysis include the approximation error of sparse grid functions and representation of ReLU functions by high-order sparse grid basis.