

Error bounds for approximations with deep ReLU neural networks in Sobolev norms

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In this talk, we extend recent advances in approximation theory of deep ReLU neural networks in a direction which is most relevant for applications in the numerical analysis of partial differential equations. We analyze to what extent deep ReLU neural networks can efficiently approximate Sobolev regular functions if the approximation error is measured with respect to weaker Sobolev norms. A trade-off between the regularity used in the approximation norm and the complexity of the neural network can be observed in upper and lower complexity bounds.