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Work Experience

Phillip Griffiths Assistant Research Professor,

Duke University, United States

Aug 2022 ~ Present

Mentors: Jianfeng Lu and Hongkai Zhao

Research Fellow, National University of Singapore, Singapore

Jan 2021 ~ Jul 2022

Mentor: Zuowei Shen

Education

Ph.D. in Mathematics, National University of Singapore, Singapore

Aug 2016 ~ Jan 2021

Thesis: *Deep neural network approximation via function compositions* [URL]

Supervisors: Zuowei Shen and Haizhao Yang

B.S. in Mathematics, Wuhan University, China

Sep 2012 ~ Jul 2016

Honors and Awards

The EASIAM (East Asia section of SIAM) Student Paper Prize, 2020 ~ 2021, first prize, URL.

Publications

* Corresponding author NUS = National University of Singapore RF = Research Fellow

Preprints

[9] (RF at NUS) Zuowei Shen, Haizhao Yang, Shijun Zhang*. *Deep network architecture beyond width and depth*. Submitted.

[8] (RF at NUS) Zuowei Shen, Haizhao Yang, Shijun Zhang*. *Deep network approximation: achieving arbitrary accuracy with fixed number of neurons*. Submitted. [arXiv]

- [7] (RF at NUS) Zuowei Shen, Haizhao Yang, Shijun Zhang*. *Deep network approximation in terms of intrinsic parameters*. Proceedings of the 39th International Conference on Machine Learning (ICML2022), PMLR 162:19909–19934, 2022. [arXiv, Conference]
- [6] (RF at NUS) Zuowei Shen, Haizhao Yang, Shijun Zhang*. *Optimal approximation rate of ReLU networks in terms of width and depth*. Journal de Mathématiques Pures et Appliquées, Volume 157, January 2022, Pages 101–135. [arXiv, Journal]
- [5] (PhD at NUS) Jianfeng Lu, Zuowei Shen, Haizhao Yang, Shijun Zhang. *Deep network approximation for smooth functions*. SIAM Journal on Mathematical Analysis, Volume 53, Issue 5, September 2021, Pages 5465–5506. [arXiv, Journal]
- [4] (PhD at NUS) Zuowei Shen, Haizhao Yang, Shijun Zhang. *Neural network approximation: Three hidden layers are enough*. Neural Networks, Volume 141, September 2021, Pages 160–173. [arXiv, Journal]
- [3] (PhD at NUS) Zuowei Shen, Haizhao Yang, Shijun Zhang. *Deep network with approximation error being reciprocal of width to power of square root of depth*. Neural Computation, Volume 33, Issue 4, April 2021, Pages 1005–1036. [arXiv, Journal]
- [2] (PhD at NUS) Zuowei Shen, Haizhao Yang, Shijun Zhang. *Deep network approximation characterized by number of neurons*. Communications in Computational Physics, Volume 28, Issue 5, November 2020, Pages 1768–1811. [arXiv, Journal]
- [1] (PhD at NUS) Zuowei Shen, Haizhao Yang, Shijun Zhang. *Nonlinear approximation via compositions*. Neural Networks, Volume 119, November 2019, Pages 74–84. [arXiv, Journal]