YIQI GU

School of Mathematical Sciences, University of Electronic Science and Technology of China, Sichuan, China
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Education

- **Purdue University, West Lafayette, IN, United States**
  - Ph.D. in Mathematics, Aug. 2014 - Aug. 2019
  - Concentration: applied mathematics
  - Dissertation: spectral methods in complex geometry
  - Dissertation Advisor: Jie Shen

- **University of Washington, Seattle, WA, United States**
  - M.Sc. in Applied Mathematics, Sep. 2012 - Mar. 2014

- **Zhejiang University, Hangzhou, Zhejiang Province, China**
  - B.Sc. in Information & Computing Science, Sep. 2008 - Jun. 2012

Employment History

- **University of Electronic Science and Technology of China**
  - Professor, Nov. 2023 - present
  - Research fellow (tenure-track), Mar. 2023 - Oct. 2023

- **The University of Hong Kong**
  - Postdoctoral fellow, Jun. 2021 - Feb. 2023.

- **National University of Singapore**
  - Research fellow, Aug. 2019 - May. 2021

- **Purdue University**
  - Visiting assistant professor, Jan. 2020 - May. 2020
  - Teaching assistant, Aug. 2014 - Jan. 2017
  - Research assistant, Jan. 2016 - Aug. 2018
  - Graduate student instructor on Calculus II, Jan. 2019 - May. 2019

Research Interest

- Data science and deep learning; Numerical methods for partial differential equations

Courses and Seminars

- **Linear algebra and analytic geometry (undergraduate)**
  - 2023-2024 1st semester

- **Seminar: mathematical foundations of deep learning**

– 2023-2024 1st semester

Publications

- **Published**

  – Y. GAO, Y. GU AND M. K. NG, *Gradient descent finds the global optima of physics-informed neural networks*, Proceedings of the 40th International Conference on Machine Learning, 2023, 202, pp. 10676-10707.

  – Y. GU AND M. K. NG, *Deep neural networks for solving extremely large linear systems*, SIAM Journal on Scientific Computing, 2023, 45(5), pp. A2356-A2381.

  – Y. GU AND M. K. NG, *Data-driven denoising in the discovery of dynamics*, Journal of Computational Physics, 2023, 486, 112102.

  – Y. GU AND J. SHEN, *A fictitious domain spectral method for solving the Helmholtz equation in exterior domains*, Journal of Scientific Computing, 2023, 94(3), 46.

  – Y. GU, J. HARLIM, S. LIANG, AND H. YANG, *Stationary density estimation of itô diffusions using deep learning*, SIAM Journal on Numerical Analysis, 2023, 61(1), pp. 45-82.

  – Y. GU AND M. K. NG, *Deep adaptive basis Galerkin method for high-dimensional evolution equations with oscillatory solutions*, SIAM Journal on Scientific Computing, 2022, 44(5), pp. A3130-A3157.

  – Q. DU, Y. GU, H. YANG AND C. ZHOU, *The discovery of dynamics via linear multistep methods and deep learning: Error estimation*, SIAM Journal on Numerical Analysis, 2022, 60(4), pp. 2014-2045.

  – Y. GU AND M. K. NG, *Deep Ritz method for the spectral fractional Laplacian equation using the Caffarelli-Silvestre extension*, SIAM Journal on Scientific Computing, 2022, 44(4), pp. A2018-A2036.

  – Y. GU, H. YANG AND C. ZHOU, *SelectNet: Self-paced learning for high-dimensional partial differential equations*, Journal of Computational Physics, 2021, 441, 110444.

  – Y. GU, C. WANG AND H. YANG, *Structure probing neural network deflation*, Journal of Computational Physics, 2021, 434, 110231.

  – Y. GU AND J. SHEN, *An efficient spectral method for elliptic PDEs in complex domains with circular embedding*, SIAM Journal on Scientific Computing, 2021, 43(1), pp. A309-A329.

  – Y. GU AND J. SHEN, *Accurate and efficient spectral methods for elliptic PDEs in complex domains*, Journal of Scientific Computing, 2020, 83(3), 42

  – Y. GU AND J. SHEN, *Bound preserving and energy dissipative schemes for porous medium equations*, Journal of Computational Physics, 2020, 410, 109378.

  – Y. GU, X. YANG, M. PENG AND G. LIN, *Robust weighted SVD-type latent factor models for rating prediction*, Expert Systems With Applications, 2019, 141, 112885.

  – Y. GU AND X. CHENG, *A numerical approach for defect modes localization in an inhomogeneous medium*, SIAM Journal on Applied Mathematics, 2013, 73(6), pp. 2188–2202.

- **Preprint**

  – Y. GU AND M. K. NG, *Improving the optimization of deep learning using auxiliary variables*, preprint

Conferences/Presentations

- Presentation at Graduate Research Day, Purdue University, United States, Nov. 19 2016

- Poster Presentation at Conference on Scientific Computing and Approximation, Purdue University, United States, Mar. 30 2018

- Mini-symposium Presentation at SIAM Conference on Computational Science and Engineering(CSE19), Spokane, United States, Feb. 25 2019

- Presentation at a departmental seminar, Zhejiang University, China, Mar. 12 2019

- Presentation at Spring 2019 Finite Element Circus, Purdue University, United States, Mar. 23 2019

- Presentation at a departmental seminar, Zhejiang University, China, Sep. 28 2020

- Presentation at a departmental seminar, Texas Tech University, United States, Nov. 11 2020

- Presentation at Data Science Seminar, Purdue University, United States, Jan. 18 2021

- Presentation at 10th Symposium on Applied and Computational Mathematics, National University of Singapore, Singapore, Jun. 9 2021

- Presentation at Mathematical Foundation and Application of Deep Learning, IMA Workshop, Purdue University, United States, Aug. 12 2021

- Presentation at a departmental seminar, Shanghai University of Finance and Economics, Sep. 16 2021

- Presentation at a departmental seminar, Shanghai Jiao Tong University, Dec. 21 2022

- "人工智能中的数学和学习理论与方法" 学术研讨会, South China University of Technology, June. 3 2023

- Presentation at International Conference on Spectral and High Order Methods, Yonsei University, Seoul, Korea, Aug. 15 2023

- Presentation at 10th International Congress on Industrial and Applied Mathematics, Waseda University, Tokyo, Japan, Aug 21, 2023