Curriculum Vitae/Resume
Boyuan Yao
Graduate Research Assistant, Oden Institute

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Education

University of Texas at Austin, Austin, TX — Aug 2023-Present
Ph.D. of Computational Science, Engineering, and Mathematics
Advisor: Omar Ghattas
GPA: overall 4.0/4.0

Fudan University, Shanghai, China — Sep 2019-Jun 2023
*Bachelor of Science **with Honors** in Data Science and Big Data Technology*
GPA: overall 3.66/4.0

Publication

Faster stochastic algorithms for minimax optimization under polyak-Łojasiewicz condition.
Lesi Chen, Boyuan Yao, and Luo Luo
Advances in Neural Information Processing Systems, 2022.

Oral Presentation

Derivative-Informed Fourier Neural Operator with Applications to PDE-Constrained Optimization — Mar 2025
SIAM Conference on Computational Science and Engineering — Fort Worth, TX

Active Research

Derivative-informed Fourier Neural Operator — Jul 2024-Present
Group research, supervised by Dr. Omar Ghattas, Oden Institute, University of Texas at Austin

- Deriving the approximation theory for Fourier Neural Operator on operator Jacobian.
- Developing an efficient scheme for the derivative-informed Fourier neural operator training.
- Applying surrogates to PDE-constrained optimization.

Research Experience

Convergence Analysis of Iterative Eigenvalue Solver — Feb 2023-Jun 2023
Graduation thesis, supervised by Dr. Meiyue Shao, School of Data Science, Fudan University

- Simplified the convergence analysis of SPINVIT (Subspace version of Preconditioned INVerse ITeration) by involving the KKT analysis by recent work on PINVIT.

Automate Model Parallel for Deep Learning Training — Jul 2022-Nov 2022
Group research, supervised by Dr. Yang You, School of Computing, National University of Singapore

- Generalized activation checkpoint strategy solver to multiple GPUs for optimality-guaranteed strategy, built a communication-aware auto-activation checkpoint system to better combine with tensor parallelism strategies.
- Implemented meta profiler based on PyTorch to provide fine-grained training cost estimation without materializing model parameters or running the model.
- One of the main contributors to the open-source project Colossal-AI.

Open Domain Dialogue Chatbot — Jun 2022-Oct 2022
Group research, supervised by Prof. Yang You, School of Computing, National University of Singapore

- **The chatbot system was adopted by Geely Automobile Holdings Limited**
- Collected and modified current datasets of Chinese NLP tasks to build a large-scale dataset that is suitable for open-domain chatbot finetuning & pre-training tasks.
- Optimized search-engine-based knowledge retrieval module by making use of the special knowledge text boxes of search engines, providing cleaner text to model so that it could better extract the knowledge for response module

Faster Stochastic Algorithms for Minimax Optimization — Mar 2022-Sep 2022
Group research, supervised by Dr. Luo Luo, School of Data Science, Fudan University

- **Paper accepted by NeurIPS 2022**
- Introduced SPIDER-GDA to find an ϵ-approximate solution of finite sum minimax problem under two-sided Polyak-Łojasiewicz conditions within $\mathcal{O}\left(\left(n+\sqrt{n}\kappa_x\kappa_y^2\right)\log(1/\epsilon)\right)$ stochastic first-order oracle (SFO) complexity, where the original SOTA requires $\mathcal{O}\left(\left(n+n^{2/3}\kappa_x\kappa_y^2\right)\log(1/\epsilon)\right)$ SFO complexity.
- Introduced AccSPIDER-GDA to further accelerate the SPIDER-GDA algorithm to find an ϵ-approximate solution within $\tilde{\mathcal{O}}\left(\sqrt{n}\kappa_x\kappa_y\log^2(1/\epsilon)\right)$ SFO complexity when $\sqrt{n}\lesssim\kappa_y$.

Grants/Awards

College Recruitment Fellowship, **University of Texas at Austin** 2023
- Full scholarship and yearly stipend granted to selected incoming doctoral students.

Bachelor of Science with Honors, **Fudan university** 2023
- 1 out of 72 graduating students from the program Data Science and Big Data Technology recognized for exemplary academic achievements

3rd Prize of the Scholarship for Outstanding Students, **Fudan University** 2022
2nd Prize of the Scholarship for Outstanding Students, **Fudan University** 2021
2nd Prize of the Scholarship for Outstanding Students, **Fudan University** 2020

Professional Experience

PerfXLab Jul 2021-Aug 2021
Software Engineer
- Maintained the OpenBLAS library.
- Optimized the performance of NCNN library based on the RISC-V instruction set.

National University of Singapore Jul 2022-Nov 2022
Research Intern

Reference

Omar Ghattas
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Chief Scientist, TACC Frontera Supercomputer
University of Texas at Austin
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(Doctoral Advisor)