Zeyu Yang

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Research Interests

Large Scale Machine Learning; Generative Modeling

Education

Rice University August 2024 – Present
Ph.D. in Electrical and Computer Engineering, Advisor: Prof. Anshumali Shrivastava

Rice University August 2021 – May 2023
M.S. in Data Science, Advisor: Prof. Joe Warren and Prof. Akane Sano

University of Electronic Science and Technology of China August 2017 – May 2021
B.E. in Electronic Information Engineering, GPA: 3.66/4.00

Research Experience

Rice Rush Lab December 2024 – Present
Graduate Research Assistant, with Prof. Anshumali Shrivastava

- Developed a novel parameter-efficient fine-tuning method for quantized foudation models based on sparse dictionary learning, achieving both memory efficiency during fine-tuning and computational efficiency during inference, with significantly fewer trainable parameters compared to baseline methods such as low-rank adaptation [1].

Rice Computational Wellbeing Group January 2024 – July 2024
Graduate Student Researcher, with Prof. Akane Sano

- Developed a fair diffusion model to generate balanced mixed-type tabular data conditioned on multiple labels [2].
- Created a self-supervised multimodal learning method for stress detection using time series and tabular data [3].

Rice Computer Graphics/Geometric Design Group May 2022 – August 2022
Graduate Student Researcher, with Prof. Joe Warren

- Designed lecture notes and Python programming assignments that cover the principles of neural networks.
- Developed a Python toolbox for animating the training progress of multi-layer perceptrons [7].

Monash Data Futures Institute December 2020 – March 2021
Undergraduate Student Researcher, with Prof. Hao Wang

- Developed an asynchronous distributed alternating direction method of multipliers (ADMM) algorithm to optimize energy trading problems under asynchronous communication, allowing communication delay and indicating a potential for better outcomes in real-world applications [6].

Selected Publications [Full List]

In Submission:

[1] **Zeyu Yang**, Tianyi Zhang, Junda Su, Yang Sui, Anshumali Shrivastava, "Extreme Parameter-Efficient Fine-Tuning with Sparse Dictionary Learning", in submission to *Neural Information Processing Systems (NeurIPS)*, 2025.

Journal Publications:

[2] **Zeyu Yang**, Han Yu, Peikun Guo, Khadija Zanna, Xiaoxue Yang, Akane Sano, "Balanced Mixed-Type Tabular Data Synthesis with Diffusion Models", *Transactions on Machine Learning Research (TMLR)*, 2025.

Conference Publications:

[3] **Zeyu Yang**, Han Yu, Akane Sano, "Contrastive Pretraining for Stress Detection with Multimodal Wearable Sensor Data and Surveys", in *Conference on Health, Inference, and Learning (CHIL)*, 2025.

[4] Yuanhao Gong, Tan Tang, **Zeyu Yang**, Lantao Yu, "A Filter for Minimizing Gaussian Curvature on 3D Triangular Meshes", in *International Symposium on Biomedical Imaging (ISBI)*, 2025.

[5] Yizhuo Yang, Huan Wang, Zhiliang Liu, **Zeyu Yang**, "Few-Shot Learning for Rolling Bearing Fault Diagnosis via Siamese Two-Dimensional Convolutional Neural Network", in *Asia-Pacific International Symposium on Advanced Reliability and Maintenance Modeling*, 2020.

Preprints:

[6] **Zeyu Yang**, Hao Wang, "Network-Aware Asynchronous Distributed ADMM Algorithm for Peer-to-Peer Energy Trading", *arXiv:2312.06976*, 2023.

Published Software:

[7] *PlotNet*. (2022). [Online]. Available: https://github.com/zeyuyang8/plotnet

Awards & Honors

Outstanding Undergraduate Student Award 2021
Meritorious Winner of Interdisciplinary Contest in Modeling 2020

Teaching Experience

Data Visualization (COMP 665) at Rice University, Spring 2022 – Spring 2023
Teaching Assistant, with Prof. Joe Warren

Statistics for Data Science (COMP 680) at Rice University, Spring 2023
Academic Tutor, with Prof. Chen Su

Introduction to Data Science (DSCI 101) at Rice University, Fall 2024
Teaching Assistant, with Prof. Lorenzo Luzi

Skills & Certificates

Programming:

- *Data Science:* C++, CUDA, Python (PyTorch, Hugging Face, Matplotlib), MATLAB, Tableau
- *Web Development:* Python (Django, Dash), HTML, CSS, JavaScript (React), PostgreSQL
- *IT Skills:* Git, AWS, Docker, Linux, Markdown, LaTeX

Coursera Certificates:

- Back-End Developer Professional Certificate offered by Meta
- Front-End Developer Professional Certificate offered by Meta
- Database Engineer Professional Certificate offered by Meta

Coursework

Graduate Coursework:

- *Computer Science:* Programming for Data Science, Big Data Management for Data Science, Data Visualization, Graduate Design and Analysis of Algorithms
- *Machine Learning:* Statistical Machine Learning, Deep Learning for Vision and Language, Applied Machine Learning and Data Science Projects, AI for Health, Advanced Machine Learning, Learning from Sensor Data
- *Statistics & Optimization:* Statistics for Data Science, Convex Optimization, Information Theory

Undergraduate Coursework:

- *Computer Science:* Introductory C Programming, Introductory Python Programming
- *Electrical Engineering:* Application and Design of Digital Logic, Signals and Systems, Digital Communication, Microelectronic Systems, Circuit Analysis and Design, Fundamentals of Analog Circuits
- *Math & Physics:* Linear Algebra and Space Analytic Geometry, Probability Theory and Mathematical Statistics, Calculus I, Calculus II, Physics I, Physics II