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

Rice University August 2021 – May 2023
M.S. in Data Science, GPA: 3.79/4.00

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

Skills & Certificates

Programming:

- *Data Science:* C++, CUDA, Python (PyTorch, 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

Research Experience

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

- Developed a 4-bit rotation-based outlier-free quantization framework for text-to-image diffusion transformers.

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

- Developed a fair diffusion model to generate balanced mixed-type tabular data conditioned on multiple labels [1].
- Created a self-supervised multimodal learning method for stress detection using time series and tabular data [4].

Rice Computer Graphics/Geometric Design Group May 2022 – August 2022
Graduate Student Researcher, with Professor 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 [5].

Monash Data Futures Institute December 2020 – March 2021
Undergraduate Student Researcher, with Professor 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 [2].

Publications

Preprints:

1. **Zeyu Yang**, Han Yu, Peikun Guo, Khadija Zanna, Xiaoxue Yang, Akane Sano, "Balanced Mixed-Type Tabular Data Synthesis with Diffusion Models", arXiv:2404.08254, 2024.
2. **Zeyu Yang**, Hao Wang, "Network-Aware Asynchronous Distributed ADMM Algorithm for Peer-to-Peer Energy Trading", arXiv:2312.06976, 2023.

Conference Publications:

3. 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.

Working Papers:

4. **Zeyu Yang**, Han Yu, Akane Sano, "Contrastive Pretraining for Stress Detection with Multimodal Wearable Sensor Data and Surveys", in submission to BHI, 2024.

Published Software:

5. *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), Rice University February 2022 – May 2023
Graduate Teaching Assistant, with Professor Joe Warren

- Answered questions about Python coding issues in weekly projects for a class of over 40 graduate students.
- Developed a geographical data visualization project in Tableau with detailed supporting material for future classes.

Statistics for Data Science (COMP 680), Rice University September 2022 – May 2023
Academic Tutor, for Rice Athletics

- Explained statistical techniques, such as hypothesis testing, Markov chain, and linear regression to students.
- Engaged one-on-one with students with problems in statistics and Python programming.

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