

## 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

- Designed a novel parameter-efficient fine-tuning method for quantized foundation models based on sparse dictionary learning, achieving both memory efficiency during fine-tuning and computational efficiency during inference, with significantly fewer (around 100x) trainable parameters compared to baseline methods such as low-rank adaptation [1].
- Developed an entropy-based lossless compression algorithm for float8 neural network parameters, achieving an 18% compression ratio while maintaining bit-exact reconstruction of the original model [2].

**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 [3].
- 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 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 [8].

**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 [7].

## 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.
- [2] **Zeyu Yang**, Tianyi Zhang, Zhaozhuo Xu, Anshumali Shrivastava, “To Compress or Not? Exploring Low-Entropy Exponents in Model Weights”, in submission to *International Conference on Learning Representations (ICLR)*, 2025.

*Journal Publications:*

- [3] **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:

- [4] **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.
- [5] 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.
- [6] 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:

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

### Published Software:

- [8] *PlotNet*. (2022). [Online]. Available: <https://github.com/zeyuyang8/plotnet>

## AWARDS & HONORS

---

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

## SKILLS

---

### Programming:

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

### Machine Learning:

- *Deep Learning*: Large-Language Models, Diffusion Models, Transformers, Contrastive Learning
- *Machine Learning*: Sparse Dictionary Learning, Entropy Coding, Matrix Factorization, Feature Selection, Bias Mitigation

## 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, Micro-electronic 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

## TEACHING EXPERIENCE

---

<b>Data Visualization (COMP 665)</b> at Rice University, <i>Teaching Assistant</i> , with Prof. Joe Warren	Spring 2022 – Spring 2023
---	---------------------------

<b>Statistics for Data Science (COMP 680)</b> at Rice University, <i>Academic Tutor</i> , with Prof. Chen Su	Spring 2023
---	-------------