Jinze **Zhao**

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Education

University of Texas at Austin — *Austin, Texas*

M.S. in Electrical and Computer Engineering — *Jan. 2024 - May. 2025*

- Advisor: Prof. Atlas Wang, Peihao Wang (PhD)
- GPA: 4.0 / 4.0

University of Texas at Austin — *Austin, Texas*

B.S. in Electrical and Computer Engineering, B.S. in Mathematics, with Honors — *Aug. 2019 - Dec. 2023*

- GPA: 3.92 / 4.0

Selected Coursework

Mathematics	Real Analysis I&II, Large Scale Optimization I&II, Stochastic Processes, Advanced Probability and Concentration
Machine Learning	Advanced Machine Learning, Advanced Computer Vision, Digital Video Processing, Digital Image Processing
Theory	Continuous Algorithms, Online Learning, Information Theory, Statistical Learning Theory

Publications

[1] **Jinze Zhao**, Peihao Wang, and Zhangyang Wang. "Generalization Error Analysis for Sparse Mixture-of-Experts: A Preliminary Study". In: *ICLR 2024 Workshop on Mathematical and Empirical Understanding of Foundation Models* ***(ME-FOMO @ ICLR)***. May 2024. URL: `https://arxiv.org/abs/2403.17404`.

[2] **Jinze Zhao**. "CrossEAI: Using Explainable AI to generate better bounding boxes for Chest X-ray images". In: *arXiv preprint*. 2023. arXiv: `2310.19835 [eess.IV]`. URL: `https://arxiv.org/abs/2310.19835`.

[3] Junjie Yang*, **Jinze Zhao***, Peihao Wang, Zhangyang Wang, and Yingbin Liang. "Meta ControlNet: Enhancing Task Adaptation via Meta Learning". In: *arXiv preprint*. 2023. arXiv: `2312.01255 [cs.CV]`. URL: `https://arxiv.org/abs/2312.01255`.

Academic Research

VITA — *Austin, TX*

Graduate Research Assistant — *Jan. 2024 - Present*

Advisor: Peihao Wang (PhD), Prof. Atlas Wang

- Empirically investigated the relationship between the number of activated experts per FFN layer in Sparse Mixture-of-Experts (SMoE) model and its performance on *compositional generalization* though the following:
  1. **Trained** standard SMoE models on compositional symbolic RAVEN task from scratch with different number of activated experts, showing that the OOD test accuracy will scale up with increasing number of activated experts when the task becomes compositionally harder.
  2. **Inferenced** pretrained SMoE Large Language Models such as Mixtral 8×7B, Mixtral 8×22B, and DBRX 132B Instruct on Skill-Mix compositional task, showing that the performance will scale up with increasing number of experts-per-token when the Skill-Mix task becomes compositionally harder.
  3. The work resulted a preprint.

VITA — *Austin, TX*

Undergraduate Research Assistant — *Sep. 2022 - Dec. 2023*

Advisor: Peihao Wang (PhD), Prof. Atlas Wang

- Theoretically justified a Sparsity-aware Generalization Error Bound for Sparse Mixture-of-Experts model under binary classification setting using PAC learning framework. Paper accepted by **ME-FOMO @ ICLR 2024** [1].
- Proposed Meta-ControlNet [3], a novel MAML/ANIL inspired training procedure that:
  1. Accelerated the convergence speed of original ControlNet from 6000 step to ∼1000 steps
  2. Demonstrated Zero-shot adaptation for Edge-based tasks
  3. Exhibited fast adaptation for Non-edge tasks with 100 finetuning steps
  4. The work resulted in an **arXiv preprint** [3].

IFML *Austin, TX*

Undergraduate Research Assistant *Mar. 2023 - Dec. 2023*

Advisor: Prof. Aryan Mokhtari, Prof. Sanjay Shakkottai

- Designed representation-wise adversarial attack on Federated Representation Learning algorithms such as FedRep and FedBABU.
- Proposed and Implemented attack-resilient representation learning algorithms using a variety of Robust Statistics under both Multi-task linear regression and neural network setting.
- Theoretically justifying that Robust Aggregation algorithms in Multi-task linear regression settings under noise can learn the low-dimensional representation between tasks.

AI Health Lab at UT iSchool *Austin, TX*

Undergraduate Research Assistant *Dec. 2021 – May. 2022*

Advisor: Prof. Ying Ding

- Surveyed and studied the Chest Disease CT-Scan image classification/localization problem.
- Combined Guided Backpropagation and Grad-Cam++ maps to generate more targeted bounding boxes in chest disease localization.
- Proposed patient-based contrastive learning with triplet-attention to improve the disease classification.
- Achieved 9% improvement in average Intersection over Union (IoU) on chest diseases localization across the dataset.
- The work resulted in an **arXiv preprint** [2].

Teaching

Fa2024 **Graduate Teaching Assistant**, M408L Integral Calculus
Fa2023 **Undergraduate Teaching Assistant**, ECE313 Linear Signals and Systems
Fa2023 **Undergraduate Teaching Assistant**, M408C Differentiable and Integral Calculus
Sp2023 **Undergraduate Teaching Assistant**, ECE313 Linear Signals and Systems
Sp2023 **Undergraduate Teaching Assistant**, M333L Modern Geometry
Fa2022 **Undergraduate Teaching Assistant**, M378K Introduction to Mathematical Statistics

Honors & Awards

2020-23 **Engineering Honors**, Department of Electrical and Computer Engineering, UT Austin *Austin, TX*
2023-24 **UT Engineering Scholarship (4000$ per year)**, Cockrell School of Engineering, UT Austin *Austin, TX*
2021-24 **UT TPEG Scholarship (11000$ per year)**, Texas Global, UT Austin *Austin, TX*
2023 **Bronze Medal (149th/1548)**, UW-Madison GI Tract Image Segmentation *Kaggle*
2022 **Silver Medal (24th/1097)**, Foursquare - Location Matching *Kaggle*
2022 **Silver Medal (14th/502)**, Image Matching Challenge – Reconstruct 3D Scenes from 2D Images *Kaggle*
2022 **2nd/92**, Binary Classification of synthetic dataset *Austin, TX*

Service

2025 **Reviewer**, AISTATS
2025 **Reviewer**, ICLR
2024 **Reviewer**, NeurIPS

Skills

Programming Languages Python, C, Java, MATLAB, Bash
Frameworks/Libraries/Tools PyTorch, NumPy, Pandas, JAX, HuggingFace, LaTeX, Git, Vim