Yefan Zhou

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Education

Dartmouth College — Hanover, NH
Ph.D. student in Computer Science — *Sep. 2023 – present*
Advisor: Prof. Yaoqing Yang
Research Area: Artificial Intelligence, Model Diagnostics, Weight Matrix Analysis, Loss Landscape

University of California, Berkeley — Berkeley, CA
M.Eng in Electrical Engineering and Computer Science; Major GPA: 4.0/4.0 — *Aug. 2021 – Dec. 2022*
Advisor: Prof. Michael Mahoney
Research Area: Artificial Intelligence, Efficient and Transparent Deep Learning

University of California, Berkeley — Berkeley, CA
Exchange Student; GPA: 4.0/4.0 — *Jan. 2019 – May. 2019*

Southeast University — China
B.Eng in Information Engineering; GPA: 3.7/4 — *Aug. 2016 – Jun. 2020*

Publication

- **Y. Zhou***, T. Pang*, K. Liu, C. H Martin, M. W Mahoney, Y. Yang "Temperature Balancing, Layer-wise Weight Analysis, and Neural Network Training" *Thirty-seventh Conference on Neural Information Processing Systems* (NeurIPS 2023 Spotlight)
- **Y. Zhou**, Y. Yang, A. Chang, M. W Mahoney "A Three-regime model of Network Pruning" *2023 International Conference on Machine Learning* (ICML 2023)
- **Y. Zhou**, Y. Shen, Y. Yan, C. Feng, Y. Yang "A Dataset-Dispersion Perspective on Reconstruction Versus Recognition in Single-View 3D Reconstruction Networks" *2021 International Conference on 3D Vision* (3DV 2021)
- X. Zhu, **Y. Zhou**, Y. Fan, J. Chen, M. Tomizuka "Learn to Grasp with Less Supervision: A Data-Efficient Maximum Likelihood Grasp Sampling Loss" *2022 International Conference on Robotics and Automation* (ICRA 2022)
- **Y. Zhou***, H. Lu*, S. Liu, E. Ye, A. Zhao, Z. Wang, M. W Mahoney, Y. Yang "AlphaPruning: Using Heavy-Tailed Self Regularization Theory for Improved Layer-wise Pruning of Large Language Models" (Under Review)
- **Y. Zhou***, J. Chen*, Q. Cao, K. Schürholt, Y. Yang "MD tree: a model-diagnostic tree grown on loss landscape" (Under Review)
- Q. Li, Y. Zhou, H. Yang, Y. Yan, K. Keutzer, M. W. Mahoney, Y. Yang "Sharpness-diversity tradeoff: improving flat ensembles with SharpBalance" (Under Review)

Professional Experience

Graduate Research Assistant, Dartmouth College — Hanover, NH
advised by **Prof. Yaoqing Yang** — *Sep. 2023 – Present*

- Researched a new artificial intelligence (AI) model training method focusing on dynamic layer-wise learning rate adjustments.
- Developed a novel diagnostic tool using Random Matrix Theory to evaluate the quality of AI model layers and improve training processes.

- Utilized the proposed training method to improve the performance of image classification, object detection, and language modeling tasks.
- Published a first-author paper at the 2023 Conference on Neural Information Processing Systems.

Research Engineer, International Computer Science Institute Berkeley, CA
supervised by **Prof. Michael Mahoney** *Jan. 2023 – Jun. 2023*

- Researched model compression methods for AI models, focusing on network pruning methods.
- Researched sparse ensembling methods for improving the efficiency of AI models.
- Developed backdoor detection methods to enhance AI model safety.

Graduate Research Assistant, Sky Computing Lab, UC Berkeley Berkeley, CA
advised by **Prof. Michael Mahoney** *Aug. 2021 – Dec. 2022*

- Researched hyperparameter tuning methods for AI models, focusing on tuning the model compression algorithms.
- Proposed a three-regime model based on loss landscape metrics for efficient tuning.
- Published a first-author paper at the 2023 International Conference on Machine Learning.

Research Assistant, Mechanical Systems Control Lab, UC Berkeley Berkeley, CA
advised by **Prof. Masayoshi Tomizuka** *Sep. 2020 – Dec. 2020*

- Conducted research on robotic grasping tasks using 3D vision AI models.
- Proposed a novel loss function for learning robotic grasping from sparsely labeled datasets.
- Published a second-author paper at the 2022 International Conference on Robotics and Automation.

Services and Award

Reviewers: ICML 2024, CVPR 2024, ICLR 2024, CPAL 2024, NeurIPS 2023, IROS 2022, TMLR

Teaching (Head TAs): CS70: Foundations of Applied Computer Science (Dartmouth College Spring 2024)

Talk: Invited talk at AI-TIME, "Phase transition, loss landscape and model diagnostics", Jan. 18, 2024

Award: NeurIPS 2023 Scholar Award

Skills

Programming Language: Python, Java, C/C++, CUDA, SQL, MATLAB

Deep Learning: Linear/Logistic Regression, Decision Tree, Random Forest, PCA, Clustering (K-means), Deep Models (Transformers, CNN), RL Algorithms (Q-Learning, Offline RL. etc), Model Compression (Pruning)

Developer Tools: PyTorch, Ubuntu, MujoCo, ROS, PyBullet, Slurm, PyRender, Open3D