Ajay Jaiswal

⊙ [Website](#)   𝄞 [Google Scholar](#)   ○ [GitHub](#)
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RESEARCH INTERESTS

Machine Learning: Sparse Neural Networks, Efficient Training & Inference for LLMs, Graph Machine Learning
Interdisciplinary Applications: Computer Vision, Language, Bioinformatics, Medical AI

EDUCATION

The University of Texas at Austin (UT Austin)	Jan. 2021 - Present

Ph.D. Student, School of Information || **Committee**: Profs. Ying Ding, Atlas Wang, Matt Lease, Hanlin Li

Indian Institute of Technology, Kharagpur (IIT Kharagpur)	Aug. 2015 - Jun. 2017

Grad Student, Department of Computer Science || **Committee**: Prof. Animesh Mukherjee, Pawan Goyal

PROFESSIONAL EXPERIENCE

Apple AI/ML (Foundational Model)	May. 2024 - Ongoing

Research Intern, Supervisor: Dr. Xianzhi Du, Dr. Rouming Peng

Amazon Search	Sep. 2023 - Apr. 2024

Research Intern, Supervisor: Dr. Edward Huang, Dr. Karthik Subbian

Apple AI/ML (Visual Intelligence)	May. 2023 - Aug. 2023

Research Intern, Supervisor: Dr. Yinfei Yang, Dr. Zhe Gan

Adobe Computational Photography Lab	Jun. 2022 - Aug. 2022

Research Intern, Supervisor: Dr. Eric Kee, Dr. Marc Levoy

Advanced Technology Lab, Samsung Research	Aug. 2017 - Dec. 2020

Full-Time (Lead ML Engineer), Supervisor: Dr. Vijay Narayan Tiwari

SELECTED PUBLICATIONS

Ajay Jaiswal is a winner of the inaugural Amazon Science Ph.D. Fellowship [link]. He has co-authored over 25 papers including top-tier machine learning and computer vision venues (`NeurIPS`, `ICML`, `ICLR`, `ECCV`, `ICCV`, `WACV`, *etc.*). *** indicates an equal contribution, + indicates under submission**.

▷ **Thrust I. Fundamental Efficient & Scalable Learning Algorithms**

[NeurIPS 2024]$^+$ From GaLore to WeLore: How Low Rank Weights Non-uniformly Emerge from Low Rank Gradients. **Ajay Jaiswal**, Lu Yin, Zhenyu Zhang, Shiwei Liu, Jiawei Zhao, Yuandong Tian, Zhangyang Wang.

[NeurIPS 2024]$^+$ Q-GaLore: Quantized GaLore with INT4 Projection and Layer-Adaptive Low Rank Gradients. Zhenyu Zhang, **Ajay Jaiswal**, Lu Yin, Shiwei Liu, Jiawei Zhao, Yuandong Tian, Zhangyang Wang.

[EMNLP 2024]$^+$ FFN-SkipLLM: A Hidden Gem for Autoregressive Decoding with Adaptive Feed Forward Skipping. **Ajay Jaiswal**, Bodun Hu, Lu Yin, Yeonju Ro, Shiwei Liu, Tianlong Chen, Aditya Akella.

[EMNLP 2024]$^+$ All Against Some: Efficient Integration of LLMs for Message Passing in Graph Neural Networks. **Ajay Jaiswal**, Nurendra Choudhary, Ravinarayana Adkathimar, Muthu P Alagappan, Gaurush Hiranandani, Ying Ding, Zhangyang Wang, Edward W Huang, Karthik Subbian.

[EMNLP 2024]$^+$ Is C4 Dataset Enough for Pruning? An Investigation of Calibration Data for LLM Pruning. Abhinav Bandari, Lu Yin, Cheng-Yu Hsieh, **Ajay Jaiswal**, Tianlong Chen, Li Shen, Shiwei Liu.

[ICML 2024] LLaGA: Large Language and Graph Assistant. Runjin Chen, Tong Zhao, **Ajay Jaiswal**, Neil Shah, Zhangyang Wang.

[ICML 2024] Junk DNA Hypothesis: Pruning Small Pre-Trained Weights Irreversibly and Monotonically Impairs Difficult Downstream Tasks in LLMs. Lu Yin*, **Ajay Jaiswal***, Shiwei Liu, Souvik Kundu, Zhangyang Wang.

[ICML 2024] Outlier Weighed Layerwise Sparsity (OWL): A Missing Secret Sauce for Pruning LLMs to High Sparsity. Lu Yin, You Wu, Zhenyu Zhang, Cheng-Yu Hsieh, Yaqing Wang, Yiling Jia, Gen Li, **Ajay Jaiswal**, Mykola Pechenizkiy, Yi Liang, Zhangyang Wang, Shiwei Liu.

[ICML 2024] Sparse Cocktail: Every Sparse Pattern Every Sparse Ratio All At Once. Zhangheng Li, Shiwei Liu, Tianlong Chen, **Ajay Jaiswal**, Zhenyu Zhang, Dilin Wang, Raghuraman Krishnamoorthi, Shiyu Chang, Zhangyang Wang.

[ICML 2024] `Decoding Compressed Trust: Scrutinizing the Trustworthiness of Efficient LLMs Under Compression.` Junyuan Hong, Jinhao Duan, Chenhui Zhang, Zhangheng Li, Chulin Xie, Kelsey Lieberman, James Diffenderfer, Brian Bartoldson, **Ajay Jaiswal**, Kaidi Xu, Bhavya Kailkhura, Dan Hendrycks, Dawn Song, Zhangyang Wang, Bo Li.

[ICLR 2024] `Compressing llms: The truth is rarely pure and never simple.` **Ajay Jaiswal**, Zhe Gan, Xianzhi Du, Bowen Zhang, Zhangyang Wang, Yinfei Yang.

[ICML 2023] `Graph ladling: Shockingly simple parallel gnn training without intermediate communication.` **Ajay Jaiswal**, Shiwei Liu, Tianlong Chen, Ying Ding, Zhangyang Wang.

[ICML 2023] `Instant soup: Cheap pruning ensembles in a single pass can draw lottery tickets from large models.` **Ajay Jaiswal**, Shiwei Liu, Tianlong Chen, Ying Ding, Zhangyang Wang. (Spotlight-Top5%)

[NeurIPS 2023] `The Emergence of Essential Sparsity in Large Pre-trained Models: The Weights that Matter.` **Ajay Jaiswal**, Shiwei Liu, Tianlong Chen, Zhangyang Wang.

[ICLR 2023] `Sparsity May Cry: Let Us Fail (Current) Sparse Neural Networks Together!` Shiwei Liu, Tianlong Chen, Zhenyu Zhang, Xuxi Chen, Tianjin Huang, **Ajay Jaiswal**, Zhangyang Wang. (Spotlight-Top5%)

[ICLR 2023] `Sparse MoE as the New Dropout: Scaling Dense and Self-Slimmable Transformers.` Tianlong Chen, Zhenyu Zhang, **Ajay Jaiswal**, Shiwei Liu, Zhangyang Wang. (Spotlight-Top5%)

[ICDM 2022] `RoS-KD: A Robust Stochastic Knowledge Distillation Approach for Noisy Medical Imaging.` **Ajay Jaiswal**, Kumar Ashutosh, Justin F Rousseau, Yifan Peng, Zhangyang Wang, Ying Ding.

[NeurIPS 2022] `Old can be Gold: Better Gradient Flow can Make Vanilla-GCNs Great Again.` **Ajay Jaiswal**, Peihao Wang, Tianlong Chen, Justin F Rousseau, Ying Ding, Zhangyang Wang.

[ICML 2022] `Training your sparse neural network better with any mask.` **Ajay Jaiswal**, Haoyu Ma, Tianlong Chen, Ying Ding, Zhangyang Wang. (Spotlight-Top5%)

▷ **Thrust II. Applications: Computer Vision, Medical AI, and Healthcare**

[Nature Digital Medicine 2024] `CancerGPT for few shot drug pair synergy prediction using large pretrained language models.` Tianhao Li, Sandesh Shetty, Advaith Kamath, **Ajay Jaiswal**, Xiaoqian Jiang, Ying Ding, Yejin Kim.

[WACV 2024] `Farsight: A physics-driven whole-body biometric system at large distance and altitude.` Feng Liu, Ryan Ashbaugh, Nicholas Chimitt, Najmul Hassan, Ali Hassani, **Ajay Jaiswal**, Minchul Kim, Zhiyuan Mao, Christopher Perry, Zhiyuan Ren, Yiyang Su, Pegah Varghaei, Kai Wang, Xingguang Zhang, Stanley Chan, Arun Ross, Humphrey Shi, Zhangyang Wang, Anil Jain, Xiaoming Liu.

[MICCAI 2024] `How does pruning impact long-tailed multi-label medical image classifiers?` Gregory Holste, Ziyu Jiang, **Ajay Jaiswal**, Maria Hanna, Shlomo Minkowitz, Alan C Legasto, Joanna G Escalon, Sharon Steinberger, Mark Bittman, Thomas C Shen, Ying Ding, Ronald M Summers, George Shih, Yifan Peng, Zhangyang Wang.

[ICLR 2023] `Outline, then details: Syntactically guided coarse-to-fine code generation.` Wenqing Zheng, SP Sharan, **Ajay Jaiswal**, Kevin Wang, Yihan Xi, Dejia Xu, Zhangyang Wang.

[ICCV 2023] `Physics-driven turbulence image restoration with stochastic refinement.` **Ajay Jaiswal**, Xingguang Zhang, Stanley H Chan, Zhangyang Wang

[ICCV 2023] `Single frame atmospheric turbulence mitigation: A benchmark study and a new physics-inspired transformer model.` Zhiyuan Mao*, **Ajay Jaiswal***, Zhangyang Wang, Stanley H Chan.

[WACV 2023] `Attend who is weak: Pruning-assisted medical image localization under sophisticated and implicit imbalances.` **Ajay Jaiswal**, Tianlong Chen, Justin F Rousseau, Yifan Peng, Ying Ding, Zhangyang Wang.

[ML4H 2021] `Radbert-cl: Factually-aware contrastive learning for radiology report classification.` **Ajay Jaiswal**, Liyan Tang, Meheli Ghosh, Justin F Rousseau, Yifan Peng, Ying Ding.

[ICML 2021] `Scalp-supervised contrastive learning for cardiopulmonary disease classification and localization in chest x-rays using patient metadata.` **Ajay Jaiswal**, Tianhao Li, Cyprian Zander, Yan Han, Justin F Rousseau, Yifan Peng, Ying Ding.

SERVICES

Conference Reviewer: TMLR 2024, EMNLP 2024, NeurIPS 2024,2023; ICLR 2024,2023; ICML 2024,2023,2022, ICME 2022/2023, ICDM 2022, KDD 2022

Workshops Organizer: (1) The 6th Workshop and Prize Challenge: Bridging the Gap between Computational Photography and Visual Recognition (UG2+) in conjunction with IEEE CVPR 2023 [link] (2) Edge-Device Large Language Model Competition in conjunction with NeurIPS 2024 [link]

Invited Talks: Department of Computer Science, Michigan State University (March 2023, April 2022); Adobe (August 2022); Apple AIML (August 2023)

Teaching Assistant: IIT Kharagpur CSE 205I: Operating System Lab (Fall 2016), IIT Kharagpur CSE 201G: Graduate Machine Learning Lab (Spring 2017)

AWARDS/HONORS

Amazon Science Ph.D. Fellowship (inaugural), by UT Austin-Amazon Science Hub, in 2023.
Professional Development Fellowship by School of Information, UT Austin in 2021, 2024.
Recipient of **ICLR 2024 Travel Grant**.
Winner of **AI Health Data Challenge** at UT Austin. [First Prize - USD 1000]
Recipient of **Graduate Recruitment Fellowship** by UT Austin.
Recipient of **Graduate School Fellowship** by the Government of India in 2015.

MENTEES

Runjin Chen (PhD Student, ECE@UT Austin)	Aug 2023 - present
Charles O Nimo (MS Student, CS@UT Austin)	March. 2022 - Feb 2023
Emerald Zhang (Undergarduate student, CS@UT Austin)	Jan. 2023 - May 2023