Shaden Alshammari

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Education

Massachusetts Institute of Technology (MIT) **Cambridge, MA**

MEng in Computer Science and Engineering; GPA: 5.0/5.0 *Sep. 2023 – Feb. 2025*
Thesis: *A Unifying Framework for Representation Learning.* ***Advisor:*** *William T. Freeman*

B.S. in Computer Science and Engineering & in Mathematics; GPA: 5.0/5.0 *Sep. 2019 – Jun. 2023*

Technical Skills

Domains Self-Supervised Learning, Imbalanced Learning, Vision Language Models, Networks
Languages Python, Julia, MATLAB, Java, JavaScript, C.
Frameworks PyTorch, TensorFlow, Keras, Scikit-learn, OpenCV, CUDA, Microsoft Azure, AWS.

Publications

[1] A Unifying Framework for Representation Learning *(Under review for ICLR 2025; received high scores)*
S. Alshammari, Mark Hamilton, Axel Feldmann, John R. Hershey, William T. Freeman.

[2] Long-Tailed Recognition via Weight Balancing *(CVPR, 2022; +170 citations)*
S. Alshammari, Yu-Xiong Wang, Deva Ramanan, Shu Kong.

[3] Vision-Language Models Do Not Understand Negation *(ECCVW 2024; under review for CVPR 2025)*
S. Alshammari*, K. Alhamoud*, Yonglong Tian, Guo Li, PHS Torr, Yoon Kim, Marzyeh Ghassemi.

[4] Using Contact Microphones for Robot Manipulation *(WiML Workshop at NeurIPS, 2022)*
S. Alshammari, Victoria Dean, Tess Hellebrekers, Pedro Morgado, Abhinav Gupta.

[5] Continual Long-Tailed Recognition: Merge Tail Classes Today, Separate them Tomorrow *(2022)*
Yanan Li, **S. Alshammari**, Bin Liu, Shu Kong.

Research Experience

MIT Computer Science & Artificial Intelligence Laboratory (CSAIL) **Sep. 2023 – present**
Research Assistant *Cambridge, MA*
Developed a unified framework generalizing contrastive learning, supervised learning, dimensionality reduction, and clustering, achieving an 8% improvement in unsupervised accuracy on ImageNet clustering.

Robotics Institute - Carnegie Mellon University (CMU) **Jun. 2022 – Aug. 2022**
Research Intern *Pittsburgh, PA*
Designed algorithms leveraging contact audio as an alternative tactile modality for robot manipulation tasks.

MIT Sloan School of Management **Mar. 2022 - May 2022**
Research Assistant *Cambridge, MA*
Built a statistical pipeline and predictive model to analyze and summarize large survey datasets.

CMU Argo AI Center for Autonomous Vehicle Research **Jun. 2021 – Mar. 2022**
Research Intern *Pittsburgh, PA*
Developed an weight balancing techniques to mitigate data bias in long-tailed distribution images such as iNaturalist that achieved +6% improvement on classification tasks.

Teaching and Leadership Experience

Graduate Instructor for Linear Algebra and Optimization at MIT 2023-2024
Teaching Assistant for Introduction to Machine Learning at MIT 2024
Math Olympiad Trainer and problem writer for the Team Selection Tests (TST) 2019-2023
Deputy Leader & Observer at the IMO, EGMO, and CMC 2019-present

Awards and Honors

Bronze Medal at the International Mathematical Olympiad (IMO) 2017
Gold Medal at the European Girls Mathematical Olympiad (EGMO) 2017
Gold Medal at the Balkan Mathematical Olympiad (BMO) 2016
Honorable mentions from the American Mathematical Society presented at Intel ISEF 2016