Mojtaba Mozaffar

✉ mojtabamozaffar@gmail.com • mojtaba-mozaffar • mojtabamozaffar

Scientist with expertise in robotics, computer vision, and policy learning. Proven track record of impactful leadership in academia and industry, with 1700+ citations and filed patents.

PROFESSIONAL EXPERIENCE

Senior Applied Scientist at Amazon Robotics: Fall 2022–Present

- Led the development (from authoring the proposal to leading project with 10+ full-time employees) of ML-based depth estimation solutions, including monocular, stereo and multi-view stereo methods, replacing costly 3D sensors with commodity RGB cameras, achieving mm-level accuracy (10x improvement over legacy solutions) with a projected savings of $50MM over three years across several Amazon Robotics programs.
- Led a team of 4 scientists to develop multi-modal sensing stack that allows safe human-robot interactions, working with several sensing technologies including radar, thermal, and TOF sensors.
- Implemented key components of foundation perception and action models for robotic manipulators.
- Managed and mentored 7 junior scientists and interns/co-ops, and drove 3+ cross-org collaborations.
- Development of simulation tools at Amazon Robotics to close sim2real gap across multiple perception tasks.
- Published research contributions in three Amazon conferences and two filed patents.

Research Assistant Professor at Northwestern University: Summer 2021–Fall 2022

- Initiated and led three collaborative projects at the intersection of artificial intelligence and mechanics collectively involving four academic institutions and delivering 5 publications with aggressive timelines.
- Led the conceptualization and development of a *National Science Foundation* proposal and significantly contributed to three successful proposals ranging $700K-3M in funding.
- Led collaboration with several industrial partners such as *Mayo clinic* and *Machina AI*.

TECHNICAL SKILLS

Languages and Tools: Python • C++ • CUDA • Linux • Git • PyTorch • JAX • TensorRT • ROS • Isaac Lab

Machine Learning: Computer Vision • Reinforcement Learning • Imitation Learning (Diffusion and Transformer-Based Policies) • Physics-Informed ML • ML Ops and Large-Scale Training • Efficient Inferencing on Edge Compute

Robotics: Full-Stack Roboticist • Closed-Loop Sensing and Control • Tactile Sensing • Safe Human-Robot Interaction • Advanced Optimization and Trajectory Planning • Model Predictive Control

EDUCATION

Ph.D., Mechanical Engineering, Northwestern University. GPA : 3.98/4 Summer 2021

- Dissertation: Physics-Informed Artificial Intelligence Methods in Advanced Manufacturing Processes.
- Pioneered the research area of artificial intelligence-based simulation and design methods in AMPL research group, which resulted in 12 published work in highly prestigious journals such as *PNAS* and *JMPS*.

M.S., Mechanical Engineering, Northwestern University. GPA : 4.00/4 Winter 2019

B.S., Mechanical Engineering, Sharif University of Technology. GPA : 4.00/4 Spring 2015

SELECTED PUBLICATIONS (19 publications with 1700+ citations)

1. **M. Mozaffar**, et al. "Deep learning predicts path-dependent plasticity." *Proceedings of the National Academy of Sciences* 116, no. 52 (2019): 26414-26420.
2. **M. Mozaffar**, et al. "Geometry-agnostic data-driven thermal modeling of additive manufacturing processes using graph neural networks." *Additive Manufacturing* 48 (2021): 102449.
3. **M. Mozaffar**, et al. "Mechanistic artificial intelligence for modeling, design, and control of advanced manufacturing processes: Current state and perspectives." *Journal of Materials Processing Technology* 302 (2022): 117485.