

# Ahmad Ghasemi

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## PROFESSIONAL SUMMARY

Highly skilled and innovative researcher specializing in efficient deep learning techniques and computer vision. Passionate about developing cutting-edge algorithms and models that push the boundaries of AI and have real-world applications. Proven track record in leading research projects, mentoring teams, and contributing to high-impact publications.

## SKILLS

<b>Machine Learning &amp; Deep Learning:</b>	Computer Vision, Generative AI, Efficient Deep Learning, Multi-Model ML
<b>Post-training Model Optimization:</b>	Pruning, Quantization, NAS
<b>Deep Learning frameworks:</b>	PyTorch, TensorFlow, PyTorch Geometric, TensorFlow Lite
<b>Programming:</b>	Python, OpenCV, MATLAB, Julia
<b>Version Control:</b>	Git

## EXPERIENCE

<b>Efficient Deep Learning Consultant</b> , SoilX, Worcester, MA	<b>01/2024 - Present</b>
<ul style="list-style-type: none"><li>Designing and implementing efficient deep learning and tiny machine learning models for drone-based applications, focusing on model optimization and resource efficiency.</li><li>Developing and optimizing end-to-end machine learning pipelines for large-scale, multi-modal data, improving computational efficiency and model performance.</li><li>Mentoring a cross-functional team of data scientists and engineers, fostering collaboration and innovation in project development.</li></ul>	
<b>Lecturer</b> , University of Massachusetts Amherst, Amherst, MA	<b>09/2023 - Present</b>
<ul style="list-style-type: none"><li>Lectured on advanced topics in efficient deep learning, computer vision, and digital image processing.</li><li>Guided graduate and undergraduate research, focusing on innovative approaches in machine learning and model optimization.</li></ul>	
<b>Graduate AI Researcher</b> , Worcester Polytechnic Institute, Worcester, MA	<b>01/2019 - 08/2023</b>
<ul style="list-style-type: none"><li>Led a research project on low-cost, efficient deep learning algorithms for radio resource management, enhancing network capacity and computational efficiency.</li><li>Developed and implemented efficient machine learning algorithms to optimize resource management, resulting in a 40% increase in network capacity with linear complexity.</li><li>Published original research and presented findings at top-tier conferences, contributing to the field of machine learning.</li></ul>	
<b>Summer Graduate Research Internship (Funded by Ford)</b> , Wireless Positioning Lab., Michigan Tech., MI	<b>06/2019 - 08/2019</b>
<ul style="list-style-type: none"><li>Developed an efficient computer vision algorithm for autonomous vehicles, reducing latency by 15%.</li><li>Implemented the system on a Raspberry Pi, demonstrating practical, low-cost deployment.</li></ul>	

## SELECTED PROJECTS

<b>1. Efficient Graph Neural Networks</b> , UMass Amherst, Amherst, MA	<b>10/2023 - 01/2024</b>
<ul style="list-style-type: none"><li>Innovated a Low Rank Message Passing Graph Neural Network (LR-MPGNN).</li><li>This innovative design significantly reduces the model size by <b>60X</b>, with only a <b>2%</b> performance reduction in the sum rate.</li></ul>	
<b>2. Tiny Graph Classification Expressiveness</b> , UMass Amherst, Amherst, MA	<b>09/2023 - 10/2023</b>
<ul style="list-style-type: none"><li>Applied pruning, quantization-aware training, and post-training quantization techniques to optimize models.</li><li>Reduced GCN and GIN model sizes by <b>93X</b> and <b>78X</b> respectively while maintaining performance.</li></ul>	
<b>3. Adversarial attacks against graph neural networks</b> , WPI, Worcester, MA	<b>01/2022 - 02/2023</b>
<ul style="list-style-type: none"><li>Introduced four novel adversarial attacks targeting GNN-based resource management, achieving a <b>95%</b> success rate.</li></ul>	
<b>4. Low-Cost Beamforming Algorithms</b> , WPI, Worcester, MA	<b>09/2020 - 04/2021</b>
<ul style="list-style-type: none"><li>Proposed two efficient ML algorithms for resource management with linear complexity, reducing processing time by <b>60%</b>.</li></ul>	
<b>5. Real-Time object tracking</b> , Wireless Positioning Lab., Michigan Tech., Houghton, MI	<b>06/2019 - 09/2019</b>
<ul style="list-style-type: none"><li>Implemented efficient region-based CNN (R-CNN) and fast R-CNN on Raspberry Pi to track object in the real time.</li><li>Achieved <b>15%</b> less latency.</li></ul>	

## HONORS AND AWARDS

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<b>Travel Award</b> , School of Arts & Sciences, WPI, Worcester, MA, USA	<b>2022</b>
<b>TA of the Year Award (Finalist)</b> , WPI, Worcester, MA, USA	<b>2022</b>
<b>Charles Kao Best Paper Award</b> , the 29th Wireless and Optical Communications Conference, NJ, USA	<b>2020</b>

## EDUCATION

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<b>Ph.D. Data Science</b> , - Worcester Polytechnic Institute (WPI), Worcester, MA, USA	<b>2019 – 2023</b>
- Michigan Technological University (MTU), Houghton, MI, USA	<b>2018 – 2019</b>
<b>M.Sc. Electrical and Computer Engineering</b> , Shiraz University, Shiraz, Iran	<b>2009 – 2012</b>