# Ahmad Ghasemi

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## EDUCATION

**Ph.D. Data Science**, GPA: 3.94/4.0,
- Worcester Polytechnic Institute (WPI), Worcester, MA, USA **2019 – 2023**
- Michigan Technological University (MTU), Houghton, MI, USA **2018 – 2019**

**M.Sc. Electrical and Computer Engineering**, GPA: 17.27/20.0, Shiraz University, Shiraz, Iran **2009 – 2012**

## PROFESSIONAL EXPERIENCE

**Efficient Deep Learning Consultant**, SoilX, Worcester, MA **01/2024 - Present**
- Designing and implementing efficient deep learning and tiny machine learning models for UAVs, focusing on model optimization and resource efficiency.
- Developing and optimizing end-to-end machine learning pipelines for large-scale, multi-modal data, improving computational efficiency and model performance.
- Mentoring a cross-functional team of data scientists and engineers, fostering collaboration and innovation in project development.

**Lecturer**, University of Massachusetts Amherst, Amherst, MA **09/2023 - Present**
- Lectured on advanced topics in efficient deep learning, computer vision, and digital image processing.
- Guided graduate and undergraduate research, focusing on innovative approaches in machine learning and model optimization.

**Graduate AI Researcher**, Worcester Polytechnic Institute, Worcester, MA **01/2019 - 08/2023**
- Led a research project on low-cost, efficient deep learning algorithms for radio resource management, enhancing network capacity and computational efficiency.
- Developed and implemented efficient machine learning algorithms to optimize resource management, resulting in a 40% increase in network capacity with linear complexity.
- Published original research and presented findings at top-tier conferences, contributing to the field of machine learning.

**Summer Graduate Research Internship (Funded by Ford)**, Wireless Positioning Lab., Michigan Tech., MI **06/2019 - 08/2019**
- Developed an efficient computer vision algorithm for autonomous vehicles, reducing latency by 15%.
- Implemented the system on a Raspberry Pi, demonstrating practical, low-cost deployment.

## SELECTED PROJECTS

**1. Efficient Graph Neural Networks**, UMass Amherst, Amherst, MA **10/2023 - 01/2024**
- Innovated a Low Rank Message Passing Graph Neural Network (LR-MPGNN).
- This innovative design significantly reduces the model size by **60X**, with only a **2%** performance reduction in the sum rate.

**2. Tiny Graph Classification Expressiveness**, UMass Amherst, Amherst, MA **09/2023 - 10/2023**
- Applied pruning, quantization-aware training, and post-training quantization techniques to optimize models.
- Reduced GCN and GIN model sizes by **93X** and **78X** respectively while maintaining performance.

**3. Adversarial attacks against graph neural networks**, WPI, Worcester, MA **01/2022 - 02/2023**
- Introduced four novel adversarial attacks targeting GNN-based resource management, achieving a **95%** success rate.

**4. Low-Cost Beamforming Algorithms**, WPI, Worcester, MA **09/2020 - 04/2021**
- Proposed two efficient ML algorithms for resource management with linear complexity, reducing processing time by **60%**.

**5. Real-Time object tracking**, Wireless Positioning Lab., Michigan Tech., Houghton, MI **06/2019 - 09/2019**
- Implemented efficient region-based CNN (R-CNN) and fast R-CNN on Raspberry Pi to track object in the real time.
- Achieved **15%** less latency.

## SKILLS

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

## HONORS AND AWARDS

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