Ahmad Ghasemi

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SUMMARY

ML Consultant at **SoilX** specializing in efficient DL for UAVs. Concurrently serving as a **Lecturer** at **UMass Amherst**, teaching ML, DL, and CV. Passionate about Efficient Deep Learning, Tiny ML, and Generative AI, evidenced by 20+ publications. Strong mathematical, analytical, and programming skills, complemented by a GPA of 3.94/4.0.

SKILLS

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

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.

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**

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**