Mohammad **Mortazavi**

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Education

University of Toronto   *Toronto, CA*

Doctor of Philosophy (PhD) – Electrical and Computer Engineering   *September 2021 – August 2025*

- Conducted research at the intersection of Graph Neural Networks and Wireless Communications, focusing on Autonomous Vehicular Nets.
- Course Assistant for ECE345 - Algorithms & Data Structures, ECE1724 - Special Topics in Software Engineering, and INF2190 - Data Analytics.
- **Courses:** Machine Learning Fundamentals, Algorithm and Data Structures, Advanced Cellular Systems (4G/5G), Artificial Intelligence in Finance.
- **Honors:** Awarded University of Toronto Fellowship, Awarded Edward S. Rogers Sr. Graduate Scholarship.

Sharif University of Technology   *Tehran, IR*

Master of Science (MSc) – Electrical Engineering   *September 2016 – September 2018*

- Conducted research on Cooperative Relaying in Random Access Wireless Ad-Hoc Networks with Energy Harvesting Nodes.
- **Courses:** Coding Theory, Numerical Optimization Methods, Digital Signal Processing, Game Theory, Stochastic Process, Network Coding.
- **Honors:** Ranked top 0.1% in nationwide university entrance exam, Published a peer-reviewed paper in the journal IEEE Transactions on GCN.

University of Science and Technology   *Tehran, IR*

Bachelor of Science (BSc) – Electrical Engineering   *September 2012 – September 2016*

- Conducted research on Localization Techniques in LTE Networks, resulting in a publication at the 17th ISCEE and graduation with distinction.
- **Courses:** Computer Programming (C/C++), Information Theory, Probability & Statistics, Linear Algebra, Logic Circuits, Internet of Things (IoT).
- **Honors:** Graduated in the top 5 of the class '16, Granted direct admission to graduate studies with exemption from the entrance exam.

Work Experiences

Vector Institute   *Toronto, CA*

Machine Learning Associate – GenAI and NLP Cohort | Part-time (Hybrid)   *January 2025 – May 2025*

- Developed an **end-to-end ML pipeline** on **AWS** EC2, utilizing S3 for storage, to **automate** SR&ED tax report generation, reducing turnaround time from a week to under **1 hr** and cutting manual editing from 2 hours to **5 min**, ensuring **90-100%** of writing tasks are performed by AI.
- Fine-tuned and deployed domain-specific **LLM-based generative AI solutions** to automate and enhance legal/business **document drafting**.
- Implemented **RAG workflows** for context-aware document generation using real-time knowledge retrieval from Jira, GitHub, and QuickBooks.
- Integrated **retrieval**, **generator**, and **evaluator** models, leveraging a looped **agent** and **prompt engineering** to ensure compliance and quality.

Ericsson   *Montreal, CA*

Machine Learning Intern – Global AI Accelerator (GAIA) | Full-time (On-site)   *January 2024 – April 2024*

- Developed **Decentralized Distributed Machine Learning (D-DML)** algorithms in parallel using **PyTorch**, reducing training time by **23%**.
- Accelerated **distributed parallel training** by simultaneously performing **communication** and **computation**, decreasing GPU idle time by **18%**.
- Designed a communication-efficient **network topology** that balances **convergence** and **latency**, achieving a distributed consensus **1.2x** faster.
- Conducted **100+** experiments on the cluster using public datasets to evaluate the performance of distributed learning algorithms that trade-off computation and communication costs both in a **multi-core** as well as **distributed memory** setting, enhancing algorithm efficiency by **15%**.
- Delivered insights to internal **R&D teams** to enhance federated learning infrastructure and **enterprise ML model scalability**.

University of Toronto   *Toronto, CA*

Doctoral R&D Researcher – Mobile Computing Laboratory | Full-time (On-site)   *September 2022 – January 2024*

- Modeled D2D-enabled vehicular networks with Graph Transformers for efficient spectrum allocation and interference mitigation.
- Developed and tested ML-based solutions for dynamic resource management using large-scale simulation datasets and PyTorch.
- Proposed iterative learning cycles for graph-based spectrum optimization and presented findings in international ML and telecom venues.

Selected Publications

[1] **M. Mortazavi**, E. Sousa. "Intelligent Interference Management in VANETs through Dynamic Resource Allocation based on GNNs."
IEEE Wireless Communications and Networking Conference (WCNC), 2024, Dubai, United Arab Emirates.

[2] **M. Mortazavi**, E. Sousa. "GNN-based Proportional Fair Dynamic Bandwidth Allocation in Wireless Vehicular Networks."
IEEE Global Communications Conference (GLOBECOM), 2023, Kuala Lumpur, Malaysia.

[3] **M. Mortazavi**, E. Sousa. "Efficient Mobile Cellular Traffic Forecasting using Spatial-Temporal Graph Attention Networks."
IEEE 34th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), 2023, Toronto, Canada.

Professional Skills

Programming Language	Python • SQL • R • MATLAB • C/C++ • PHP • HTML/CSS
Data Science & Machine Learning	TensorFlow • PyTorch • Scikit-learn • Pandas • NumPy • Matplotlib • Spark • Azure • AWS • Databricks
Microsoft Certified Specialization	Azure AI Fundamentals: ML (Automated ML, ML Pipelines), Computer Vision (Object detection, OCR), NLP (Text Analytics, Language Understanding, Document AI, Conversational AI, Bot Service)