

# Hessam Alizadeh

(Hamidreza Lotfalizadeh, Ph.D.)

Bryan, TX (willing to relocate) | [hamidla.ap@gmail.com](mailto:hamidla.ap@gmail.com) | [linkedin.com/in/hessamla](https://www.linkedin.com/in/hessamla) | [github.com/hessamla](https://github.com/hessamla)

**SUMMARY:** ML researcher and engineer with expertise in **graph neural networks**, **distributed systems**, and **GenAI/RAG** implementations. Proven track record of delivering scalable ML solutions: achieved **80% reduction** in conflict detection time, **>80% accuracy** in pharmaceutical knowledge discovery, and **\$3M investment** through product demonstrations. Strong foundation in systems programming and cross-functional collaboration.

## EDUCATION

<b>PhD in Computer Engineering</b> Purdue University - Main Campus	Dec 2024
<b>MSc in Computer Engineering</b> Amirkabir University	Feb 2011
<b>BS in Computer Engineering</b> Azad University	Jul 2008

## TECHNICAL SKILLS

**Core Languages:** Python, C, C++, Rust, Java, JavaScript, TypeScript, C#

**ML/AI Frameworks:** PyTorch, TensorFlow, CUDA, Numpy, Pandas, SciPy, Scikit-Learn, MLFlow, Transformers, Node2Vec, NodeForce

**Deep Learning & NLP:** CNN, RNN, CRNN, GNN, GCN, GAT, Fine-Tuning, PEFT, RAG, LangChain, LangGraph, Prompt Engineering

**Data & Analytics:** Time series analysis, Entropy analysis, Statistical modeling, Design of Experiments, Real-time data streaming (MQTT)

**Infrastructure & Databases:** AWS, Neptune, GCP, OCI, Docker, Kubernetes, SLURM, Spark, SQL, Gremlin, Graph databases

**Software Engineering:** OOP, Functional Programming, Concurrent & Parallel Programming, Multi-threaded Applications, CI/CD, Git, RESTful APIs, Distributed Systems Architecture

## WORK EXPERIENCE

**Graph Networks Specialist || Inertia Systems** Jul 2024 - present

- **Architected graph-based system** for construction tech, achieving over **90% reduction** in conflict detection and resolution time for building plans
- **Designed and deployed Neptune graph database solution** with optimized Gremlin queries for real-time conflict detection across complex building structures
- **Built an interactive graph visualization UI and querying system** and enabled stakeholders for efficient and timely conflict detection.
- **Delivered critical features** that secured **\$3 million investment** through compelling product demonstrations to investors
- **Lead GenAI integration initiative** to incorporate LLM and RAG capabilities for advanced document ingestion

**Postdoctoral Researcher || Indiana University** Apr 2024 - Jul 2024

- **Researched and developed diffusion models** on dynamic graphs for simulating structural changes in complex networks
- **Created novel models** for detecting source of rumore using graph diffusion techniques
- **Applied graph diffusion algorithms** to solve alignment tasks with results pending publication

**AI/ML Intern || Eli Lilly** May 2024 - Aug 2024

- **Developed scalable ML methods** for analyzing large-scale knowledge graphs with **over 1 million nodes** using Python, JavaScript, and TypeScript
- **Achieved 96% precision** with semi-supervised learning methods for pharmaceutical knowledge discovery
- **Built RAG-powered exploration tool** integrating graph traversal algorithms for intelligent subgraph extraction and query-based analysis
- **Collaborated with cross-functional teams** across chemistry/pharma, finance, and marketing to align ML solutions with business objectives
- **Designed and deployed web interface** with interactive visualization features, improving decision-making processes for domain experts

**Data Science Researcher || Purdue University** Dec 2019 - Apr 2022

- **Architected scalable real-time streaming pipeline** using MQTT to process IoT sensor data for early incident detection
- **Built fault-tolerant distributed system** for multivariate time series analytics and prediction models
- **Implemented concurrent multi-threaded operations** enabling real-time classification across multiple data streams
- **Developed time series prediction models** improving incident detection accuracy and reducing false positives

**Software Developer || Purdue University** May 2018 - Aug 2020

- **Developed distributed systems** using Python socket programming for robust client-server connections
- **Built web server implementation with Django** for scalable data processing and RESTful API development