Hamed Akhlaghi

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Technical Skills

- C# | .Net | C | C++ | JavaScript | MSSQL | NoSQL | jQuery | React | Node | NextJS | Git | Python
- Azure | AWS |Cloud Computing | CI/CD | XUnit | NightWatch | Unit Testing | Lamda | OOP | Docker
- Microservices | Distributed Systems | Backend | Linux | Command Line Interface
- Machine Learning Algorithms | Transformers | BERT | GPT | LSTM | Reinforcement Learning | PyTorch | Tensorflow | Scikit-learning | XGBoost | Hugging Face

Work Experience

Software Engineer Jan. 2024 – Dec. 2024

Lumentum Ottawa, ON

- Spearheaded the design and development of several manufacturing test applications leveraging advanced technologies such as **Azure, C#, .NET, and Azure Functions**, driving improvements in testing efficiency and reliability.
- Developed a web application to parse and summarize hardware test results in **React** and **NodeJS**
- Designed and implemented scalable APIs and robust background workers to manage and synchronize product databases efficiently on the server side .
- Developed an error parsing application in **C# .NET** that automatically reports any errors detected during product testing directly to the Test Engineering teams, enhancing immediate response capabilities and process optimization.
- Contributed in developing a fast machine learning algorithm with **autoencoders** in calibrating the MEMS optical block
- Engineered and executed automation algorithms and procedures tailored for various Lumentum products, significantly improving automation reliability and process throughput.
- Enhanced calibration processes by implementing a better alternative optimization algorithm to the existing one, achieving a **30%** reduction in test software runtime, which contributed to decreased manufacturing time at Lumentum's Navakorn factory in Thailand.

Machine Learning Engineer Sept. 2022 – Dec. 2023

National Research Council Canada (NRC – AI4D Project) Hamilton, ON

- Developed and implemented advanced computer vision algorithms using deep convolutional neural networks (CNNs), specifically leveraging **LeNet** and **ResNet** architectures for image classification and analysis .
- Enhanced optical communication links by using Physical-informed Neural Networks to generate physically plausible phase screens.
- Optimized existing adaptive optics algorithms through the application of tailored machine learning techniques, significantly boosting performance and precision.

Software Developer Feb. 2021 – March 2022

RASAM Satellite Program Tehran, IR

- Contributed to the RASAM satellite, the second in Amirkabir University of Technology's series, following the successful launch of PAYAM, using **C#**.
- Analyzed advanced systems in leading satellite systems like Starlink and Oneweb, informing development protocols.

Software Developer (Internship) May 2019 – July 2019

Mobile Telecommunication Company of Iran (MCI) Tehran, IR

- Oversaw the performance metrics of multiple BTS stations, strategically enhancing Tehran's mobile network reliability and efficiency.
- Created a Python app streamlining BTS network oversight for MCI's engineering department by visualizing Tehran stations' performance metrics on Google Earth.
- Conducted comprehensive analysis of Iran's 3G and 4G networks, focusing on performance, infrastructure, and optimization opportunities.

Highlights of Qualifications

- Current Master of Science student seeking a 4-12 month Co-op role for January 2024 with eligible Co-op work permit
- Proficient in C++ and Python programming; experienced with algorithm development and implementation
- Experienced in data science methodologies and proficient in leveraging deep learning techniques for complex data analysis, predictive modeling, and algorithmic solutions
- Awarded the prestigious NRC Research Scholarship for academic excellence in the Electrical and Computer Engineering department.
- Areas of interest include: Machine Learning, Deep Learning, Reinforcement Learning, Transformer Models, IoT integrations, Data Science, and GPU-accelerated computing.

Education

Master of Science in Electrical and Computer Engineering Hamilton, ON

McMaster University(**GPA**: 4.00/4.00) Sept. 2022 – ongoing

- Simulating atmosphere turbulence conditions using **CNNs** to recognize turbulence patterns and **GAN**s to create phase screens and other learning techniques to imrpove the simulation.
- Designing a GPU-accerelated architecture to decrease the simulator's running time using **CUDA** and **TensorFlow**.

Bachelor of Science in Electrical Engineering Tehran, IR

Amirkabir Unviersity of Technology(**GPA**: 3.65/4.00) Sept. 2017 – Sept. 2021

- Thesis project: Implemented various algorithms in **C++** to solve Rubik's cube, including **BFS**, **DFS**, and **Bidirectional Search**.
- Ranked among top 10 from 140 students

Projects

MNIST GANs | Python, tensorflow, pytorch, Docker

- Architected and implemented a custom GAN in Python, leveraging TensorFlow and PyTorch for backend operations, emphasizing modularity and efficiency.
- Tailored the GAN to generate handwritten digits, training it on the MNIST dataset to ensure a diverse range of realistic samples.
- Incorporated advanced training techniques to stabilize GAN convergence, mitigating common issues like mode collapse.
- Utilized Docker to containerize the project, ensuring reproducibility and consistency across varying deployment environments.
- Conducted rigorous performance evaluations, with the GAN-generated digits successfully fooling a standard classifier 85 percent of the time.

Chat Server | Python

- Developed an interactive TCP/IP chat server in Python, enabling real-time, multi-user messaging with a user-friendly command-line interface.
- Employed multithreading for concurrency, optimizing server capacity to handle simultaneous communications efficiently.
- Leveraged WireShark for network analysis, enhancing server reliability and message transmission security.

Achievements

- Secured a fully funded Master's position at McMaster University, enriched by an 18,000 CAD annual research scholarship for 2022 and 2023, granted by the National Research Council (NRC).
- Ranked in top 1 percent of the bachelor's degree participants in the national entrance exam (Konkur)
- Full tuition-fee waiver scholarship for bachelor's program from the Ministry of science, research, and technology

Teaching Experience

- Full-time McMaster teacher assistant for Electrical and Computer Engineering department for both semesters, years 2023 and 2024
- Tutorial teacher assistant for Communications Systems (3TR4) course with 278 students
- Lab instructor teacher assistant for Electronic Devices and Circuits II (3EJ4) course with 288 students

Publications

- **GPU-Accelerated Multilayer Turbulence Simulation for Modeling of Free-Space Optical Systems** : Hamed Akhlaghi, Michael Taylor, Antony Orth, and Steve Hranilovic. Optical Fiber Communication Conference (OFC), 2025.
- **Fast Single Pixel Modal Wavefront Sensing** : Antony Orth, Oliver Pitts, Costel Flueraru, Terrence Stewart, Hamed Akhlaghi, Mohamadreza Pashazanoosi, Michael Taylor, and Steve Hranilovic. Available on arXiv.