Omid Vaheb

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Profile Summary

- Detail-oriented **Applied AI Scientist** specializing in **scalable ML models** for cross-functional solutions.
- **3+ years** of hands-on experience in **vision & audio processing**, model development & optimization, and advanced algorithm design through roles at **Vector Institute**, **REDspace**, **NRCC**, and **UofT**.
- **4+ years** experience in **PyTorch**, **TensorFlow**, and **C++** solving problems in real-world applications.

Professional Experience

Machine Learning Engineer | *REDspace (Software Development Company)* Remote | Jan. 2025 – Present

- Improving the **Automatic Speech Recognition (ASR)** pipeline accuracy by reducing Word Error Rate and hallucination errors, leveraging contextual data within Mockingbird AI dubbing product.
- Applied OpenAI speech-to-text model, Whisper, and developed a **multimodal** error correction solution to improve increasing overall coherence and quality of the results.

Machine Learning Associate | *Vector Institute* Toronto, Canada | Jan. 2025 – Present

- Collaborated with Vector staff and project managers to deliver deep learning solutions addressing the AI needs of SMEs, emphasizing organized workflows and industry best practices.
- Gained hands-on experience through Vector's bootcamps, mastering topics like **Retrieval-Augmented Generation (RAG)**, and **LLM fine-tuning & alignment** to optimize enterprise AI applications.

Research Assistant | *University of Toronto* Toronto, Canada | Sep. 2022 – Dec. 2024

- Achieved 15dB PSNR improvement in astronomical **image denoising**, **improving object detection by 7%**, and lowering observation costs by 66%.
- Decreased memory usage by 80%, reducing execution time up to 60%, and limiting disk access by optimizing data loaders and **accelerating model training**.
- Designed an **unsupervised** training framework by proposing a mixture of N2N and SURE loss to train denoisers while collaborating with non-technical astronomer teams and translating technical findings.

Applied Scientist | *National Research Council Canada* Victoria, Canada | Jun. 2023 – Sep. 2023

- Lowering mean absolute error in astronomical image reconstruction task by 15% by tuning the architecture of Restormer **transformer** and UNets. Implemented in Pytorch and deployed on multiple GPU clusters.
- Created **large-scale** synthetic data using simulations based on real galaxies and decreased synthesis time on CPU by 10%. Designed preprocessing pipelines to clean and prepare raw telescope data for training.

Research Assistant | *Computational Audio-Vision Lab* Remote | Apr. 2021 – Aug. 2022

- Achieved state-of-the-art performance with **92% accuracy** in Autism detection using infants' crying audio. Leveraged fine-tuning of deep networks and ensemble to train a robust classifier with Tensorflow.
- Attained **99.5%** in **data integrity & consistency metric** relative to manual human annotation by proposing an automatic data processing pipeline. The process consists of feature extraction using Google's YAMNet model and an energy-based algorithm to clean messy voice recordings.

Data Scientist | *Virasad Startup* Tehran, Iran | May 2020 – Apr. 2021

- Decreased maintenance costs up to 10% by designing a real-time **anomaly detection** system.
- Used LSTM and ARIMA models for **time series forecasting** of a series of production lines and presented technical results to stakeholders in monthly meetings using data visualization tools.

Related Skills

- **Programming:** Python, C/C++, Linux Shell Scripting, MATLAB, SQL, R, Verilog, OOP
- **AI Libraries & Frameworks:** PyTorch, Tensorflow, Keras, NLTK, OpenCV, AutoML, Fastai, JAX
- **Development Tools & Skills:** Git, Slurm, Docker, MySQL, AWS, GCP, Vertex AI, BigQuery, Dataflow, Looker, PubSub, Wandb, HDF5, Cloud Computing, DBMS, AI Solution Architecture

Education

Master of Applied Science in Electrical and Computer Engineering — Sep. 2022 – Nov. 2024
University of Toronto; GPA: 3.86/4 — *Toronto, Canada*

B.Sc. in Electrical Engineering, Minor in Computer Engineering — Sep. 2017 – Feb. 2022
University of Tehran; GPA: 3.92/4 — *Tehran, Iran*