Mohsen Motieshirazi

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SUMMARY

Experienced ML/AI Engineer skilled in multimodal machine learning across **signals, images, text, and audio**, with expertise in **deep learning**, **large language models (LLMs), and signal processing**. Partnered with **Google** on advanced ultrasound intelligence, developing edge-optimized ML models deployed in a **mobile app** that helped reduce fetal mortality in underserved regions. Built and deployed production-grade ML systems using large-scale, real-world healthcare data, improving prediction accuracy and robustness in noisy conditions. Experienced in end-to-end ML development and deploying models to **cloud and edge environments.**

Professional Experience

Postdoctoral Fellow - Biomedical AI (Google Partnership) *Emory University, GA • June 2023 – present*

- Partnered with **Google** to build **self-supervised deep learning models** for Doppler ultrasound, achieving ~1-week MAE in gestational age estimation and contributing to a **30% reduction in fetal mortality** in rural Guatemala.
- Developed a **real-time** signal-quality assessment model and deployed it in an **Android app** on Google Pixel phones, achieving **~65% improvement** in Doppler signal quality while maintaining low latency.
- Performed **signal-processing**–based data cleaning and feature extraction on **wearable in-ear EEG and ECG** data and developed **multimodal ML** pipelines that support more accessible early MCI detection.
- Applied **LoRA-based fine-tuning** and **embedding-based RAG** pipelines with **LLMs (BERT, LLaMA)** on EHR notes to identify patients at high risk of mental-health issues, improving early insight and scalable text analysis.
- Collaborated with **cross-functional teams**, including engineers, data scientists, and clinicians, to **validate AI models on real-world data** and integrate model outputs into clinical workflows for actionable decision support.
- Deployed models on **cloud** infrastructure using **AWS** services (S3, EC2, SageMaker) and **Docker** to enable scalable testing, automation, continuous integration, and distributed model evaluation.

Postdoctoral Research Associate (MGH Collaboration) *Clarkson University, NY • July 2022 – June 2023*

- Developed multimodal ML pipelines leveraging **voice data** from **ambulatory monitoring** for pathology classification, achieving a 10% boost in accuracy and improving diagnostic reliability.
- Applied **signal-processing** techniques to **acoustic** and pressure signals from vocal-fold recordings for **biomarker extraction** and improved diagnostic interpretation.
- Processed **high-speed vocal-fold videos** to extract features indicative of voice disorders, improving clinical analysis

Research Assistant *Clarkson University, NY • Jan 2017 – June 2022*

- Used **Kalman filtering** and **image processing** on vocal-fold imaging to improve pathology-related biomarkers.
- Built **statistical** and multivariate models to link physiological signals with clinically meaningful outcomes.
- Designed **real-time sensor systems** that enabled the first in-vivo acquisition of **voice-related pressure signals**, providing unprecedented data for improving voice-pathology modeling.

Technical skills

Machine Learning & AI: Deep Learning (CNNs, Transformers) • LLMs (BERT, LLaMA, GPT-style) • Self-supervised Learning • Generative AI (RAG, PEFT, LoRA) • NLP • Multimodal Fusion • Contrastive Learning • Edge AI (TensorFlow Lite, On-device Inference) • Real-Time Mobile ML • Time-series Modeling • Model Optimization • Explainable AI • Signal Processing • Adaptive Filtering • Spectral & Time–Frequency Analysis • Noise Reduction • Image Processing • Statistical Modeling and Inference

Programming & Frameworks: Python (NumPy, Pandas, SciPy, PyTorch, TensorFlow, Scikit-learn, XGBoost) • C/C++ • SQL • R • MATLAB • AWS (S3, EC2, SageMaker) • Docker • Git

Academics

Ph.D. in Engineering, **(GPA: 4.0/4.0) – Google Scholar** Clarkson University, Potsdam, NY, 2022