Mohsen Motieshirazi

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SUMMARY

Machine Learning Scientist with 6+ years of experience developing clinically validated AI algorithms for biomedical signals (EEG, ECG, Doppler ultrasound). Proven expertise in deep learning, digital signal processing, and large-scale clinical data analysis. Strong track record of end-to-end algorithm development, from data curation to regulatory documentation and deployment on cloud and embedded systems. Passionate about advancing healthcare through innovative biosignal analytics and machine learning.

Experience

Postdoctoral Fellow - Biomedical Informatics, Emory University, GA, US

June 2023 - present

- Developed self-supervised and deep learning models for 1D Doppler ultrasound (gestational age estimation MAE ≈ 1 week; fetal HR RMSE: 2.1 bpm).
- Engineered EEG pipelines for in-ear wearable devices, enabling real-time detection of auditory stimulation responses and early cognitive decline biomarkers.
- Built and deployed ensemble ECG models for mobile devices, detecting atrial fibrillation with 94% F1.
- Designed real-time signal quality assessment system (TensorFlow Lite) for Android (97.6% accuracy, <150ms latency).
- Optimized DSP methods (noise reduction, saturation detection, anomaly detection) to enhance robustness of continuous physiological monitoring.
- Collaborated with clinicians and engineers to deploy models on 10,000+ physiological recordings, ensuring clinical reliability.
- Contributed to regulatory-ready documentation and validation of algorithms for clinical translation.

Postdoctoral Research Associate, Clarkson University, NY, USA

July 2022 – June 2023

- Applied ML and statistical analysis to wearable sensor datasets, achieving 10% improvement over baseline for chronic condition monitoring.
- Led multimodal feature fusion (acoustic, acceleration, pressure signals) for biomarker discovery.
- Built ML models (SVM, XGBoost, CNNs) for vocal pathology classification; improved accuracy by 10%.
- Applied dimensionality reduction (PCA, t-SNE) and feature selection to improve interpretability of complex datasets.

Research Assistant, Clarkson University, NY, USA

Jan 2017 – June 2022

- Developed image processing and Kalman filter algorithms to estimate vocal fold collision pressure from high-speed imaging, achieving <7% error compared to ground truth measurements.
- Designed in-vivo multimodal monitoring systems integrating video, acoustic, and pressure signals.
- Applied hypothesis testing and multivariate modeling to correlate physiological signals with clinical outcomes.

Technical skills

Machine Learning & Signal Processing: Machine learning, Deep learning (CNNs, RNNs, Transformers), self-supervised learning, Feature engineering, time-series analysis, adaptive filtering, Image processing, Spectral analysis, Noise reduction, multimodal data fusion

Programming & Frameworks: Python (NumPy, Pandas, SciPy, TensorFlow, PyTorch, Scikit-learn), C/C++, MATLAB, SQL, R, Cloud Computing (AWS), Docker

Academics