Amirmohammad Mohammadi

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PROFILE SUMMARY

4+ years of research experience in developing AI-driven solutions across diverse applications in digital health & wearables, scientific ML/AI, remote monitoring, circuits & systems design, and audio. Educational background in electrical & computer engineering. Four first-authored publications and contributions in open repositories.

EXPERIENCE

Texas A&M University, College Station, Texas   September 2022 – Present
Research Assistant
- Devised an audio spectrogram diffusion transformer pipeline aimed to generate new samples for limited audio datasets, and improve the generalizability.
- Introduced a histogram-based parameter-efficient transfer learning method for resource intensive spectrogram transformer models, reducing tunable parameters by **40%** compared to adapters.
- Developed a feature engineering method for neural networks, improving classification accuracy by **7%**.
- Contributed to cross-domain knowledge transfer learning applications of acoustic data using **PyTorch** (Lightning) ImageNet and AudioSet pre-trained models and gradient-based explainable AI.
- Analyzed physiological time-series signals using **Python** and **TensorFlow** with physics-informed neural networks for cardiovascular dynamics, decreasing required ground truth by a factor of **15**.

Sharif University of Technology, Tehran, Iran   July 2019 – February 2021
Student Researcher
- Developed a low-power sensor for mental stress diagnosis taking a **software & hardware** approach.
- Designed circuits schematics and PCB using Altium Designer using **C**, and ML algorithms using **MATLAB**.

SKILLS

Python (PyTorch, TensorFlow, NumPy, Pandas, Matplotlib), Jupyter Notebook, Spyder.

EDUCATION

Texas A&M University, College Station, Texas   April 2027 (anticipated)
Doctor of Philosophy in Computer Engineering

Sharif University of Technology, Tehran, Iran   February 2021
Master of Science in Electrical Engineering

University of Tabriz, Tabriz, Iran   September 2018
Bachelor of Science in Electrical Engineering

PUBLICATIONS

- **Mohammadi, A**., Carreiro, D., Van Dine, A., & Peeples, J. (2025). Histogram-based Parameter-efficient Tuning for Passive Sonar Classification. *PREPRINT*. [link]
- Ritu, J., **Mohammadi, A**., Carreiro, D., Van Dine, A., & Peeples, J. (2025). Structural and Statistical Audio Texture Knowledge Distillation (SSATKD) for Passive Sonar Classification. *PREPRINT*. [link]
- **Mohammadi, A**., Masabarakiza, I., Barnes, E., Carreiro, D., Van Dine, A., & Peeples, J. (2025). Investigation of Time-Frequency Feature Combinations with Histogram Layer Time Delay Neural Networks. *IEEE OCEANS*. [link]
- **Mohammadi, A**., Kelhe, T., Carreiro, D., Van Dine, A., & Peeples, J. (2025). Cross-Domain Knowledge Transfer for Underwater Acoustic Classification Using Pre-trained Models. *IEEE OCEANS.* [link]

- Sel, K., **Mohammadi, A.**, Pettigrew, R. I., & Jafari, R. (2023). Physics-informed neural networks for modeling physiological time series for cuffless blood pressure estimation. *Nature NPJ Digital Medicine*, 6(1), 110. [link]
- **Mohammadi, A.**, Fakharzadeh, M., & Baraeinejad, B. (2022). An integrated human stress detection sensor using supervised algorithms. *IEEE Sensors Journal*, 22(8), 8216-8223. [link]

POSTER PRESENTATIONS

- **Mohammadi, A.**, Masabarakiza, I., Barnes, E., Carreiro, D., Van Dine, A., & Peeples, J. (2024, April). Investigation of Time-Frequency Feature Combinations with Histogram Layer Time Delay Neural Networks. Poster session presented at the *Electrical & Computer Engineering Graduate Spring Poster Event*, College Station, TX.
- **Mohammadi, A.**, Sel, K., Pettigrew, R. I., & Jafari, R. (2023, October). Physics-Informed Neural Networks for Modeling Cardiovascular Dynamics. Poster session presented at the *2023 AI in Health Conference*, Houston, TX.

LEADERSHIP & SERVICE

Peer-Review and Conference Support:
- Served as a Helper/Area Chair for Applied Signal Processing Systems at IEEE ICASSP 2024, helping manage the peer-review process and reviewer assignments.
- Served as Reviewer for IEEE ICASSP 2023.

Research Mentorship:
- Guided an undergraduate student for development of a Diffusion Generative AI project.

Teaching Support:
- Graded coursework in Principles of Electronics, providing timely feedback.