Seyed Mohammad Amin Heydarshahi

github.com/heydarshahi

Research Interests

Neural Network Perception | Multimodal Machine Learning | Computer Vision

Education

2019 – Present   **Master of Science**, *Artificial Intelligence*, University of Erlangen-Nürnberg, Germany
Started with Communications and Multimedia Engineering. Switched to AI in 2021

2013 – 2018   **Bachelor of Science**, *Computer Science*, Sharif University of Technology, Iran
Scored **top 1%** in the national university entrance exam, entered the **highest-ranking** university in Iran

Projects

1-Person   **Functional Specialization between Music and Speech in Convolutional Neural Networks**, Master Project 2
- Trained 4 dual-task **neural networks** on music and speech to **compare perception of brain and CNNs**
- Designed **lesioning experiments** to quantify segregation between music and speech in CNNs
- Analyzed impact of batching method and network architecture on the level of task segregation

2-Person   **Biological Learning**, Master Project 1
- Reproduced two **biologically-inspired neural networks** following Hebb's rule
- Adapted a convolutional version and scaled up the models to Tiny ImageNet dataset
- Demonstrated a decrease in performance and an increase in generalizability of Hebbian learning

3-Person   **Musical Instrument Separation**, Music Processing course project at FAU
- Implemented two signal processing methods for musical instrument **source separation** in Python
- Used spoken speech spectrogram of singer as template matrix for non-negative matrix factorization

Work Experience

2022 – 2023   **Fraunhofer IIS**, Student Research Assistant, Quantum Reinforcement Learning
- Developed a **reinforcement learning agent** environment for quantum circuit optimization
- Boosted circuit scanning speed by 57 times using local gate search

2020 – 2022   **Fraunhofer IIS**, Student Research Assistant, Deep Learning for Video Compression
- Trained >10 deep learning models to improve **hybrid video compression** methods
- Tested three convolutional models to predicting **optical flow** with TensorFlow and PyTorch

2019 – 2020   **International AudioLabs Erlangen, Fraunhofer IIS**, Student Research Assistant, Music and Speech Processing
- Developed a **speech alignment** method with Dynamic Time Warping with an error of .25 seconds
- Wrote a Jupyter notebook to compare performance of filterbanks in SciPy and Librosa

Technical Skills

Programming	Python, Java, MATLAB, R	**Deep Learning**	PyTorch, TensorFlow, Keras
Other	Pandas, Librosa, TensorBoard | Excel, Word, PowerPoint, LaTeX| Linux, Windows | Git		

☎ +49 176 32561099   •   ✉ amin.heydarshahi@fau.de

Languages

- **English:** Fluent
- TOEFL iBT: 103/120

- **Persian:** Native
- **German:** Currently at B2 level