Maryam Rahimi (She/Her/Hers)

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EDUCATION

Iran University of Science and Technology Tehran, Iran

Master of Science in Biomedical Engineering, Bioelectric *2021- present*

- Supervisor: Dr. Mohammad Reza Daliri
- Co-supervisor: Dr. Yadollah Yaghoobzadeh
- GPA: 3.88/4.0
- Relevant Course Works:
  - Artificial Neural Networks
  - Statistical Pattern Recognition
  - Biomedical Signal Processing
  - Wavelets: Applications in Signal and Image Processing
  - Computational Neuroscience
  - Brain Computer Interface Systems
  - Biomedical Image Processing

Ferdowsi University of Mashhad Mashhad, Iran

Bachelor of Science in Electrical Engineering, Electronics *2017 -2021*

- Supervisor: Dr. Mohammad Reza Akbarzadeh Totonchi
- GPA: 3.29/4.0
- Relevant Course Works:
  - Soft Computing
  - Computer Architecture
  - Digital Signal Processing
  - Signals and Systems

RESEARCH INTEREST

- Deep Learning
- Natural Language Processing
- Computational Neuroscience
- Signal and Image Processing

PUBLICATIONS

P. Nourmohammadi, **M. Rahimi-H**, M. Zamani-T, M. R. Akbarzadeh-T. Baby Cry Detection Using Deep Learning. *9th Iranian Joint Congress on Fuzzy and Intelligent Systems (CFIS)*. March 2-4, 2022

HONORS AND AWARDS

- **Ranked 3rd in GPA** among all graduate students in biomedical engineering- bioelectric, Iran University of Science and Technology, 2023.
- Received the Sparkling Talent Quota from **Iran University of Science and Technology** and **Ferdowsi University of Mashhad** to enter the Master's without entrance exam due to exceptional academic performance, Iran, 2021.
- Ranked in the top 15% in GPA among all undergraduate students in electrical engineering, Ferdowsi University of Mashhad, 2021.
- **Placed 3rd in Rahneshan competition**, held by Iran's National Elite Foundation, Iran, 2021.
- **Teamwork award** in innovation festival, Ferdowsi University of Mashhad, 2020.
- Secured an **investment of $9300** (120 million Toman) from Trig Up Accelerator for our startup Rebike, after pitching to potential investors at the Roshdafarini event, Mashhad, 2019.

RESEARCH EXPERIENCES

Neuroscience and Neuroengineering Research Laboratory (NNRL)
Iran University of Science and Technology

Tehran, Iran
Sep. 2021- presen

Graduate Research Assistant

Supervisors: Dr. Mohammad Reza Daliri & Dr. Yadollah Yaghoobzadeh

M.Sc. Thesis: *Studying the computational basis of language processing in the brain and deep language models*

- Comparing the brain activities, recorded while subjects listened to spoken narratives, with the language model representations to the same input sentences.

Center of Excellence in Soft Computing and Intelligent Information Processing (SCIIP)
Ferdowsi University of Mashhad

Mashhad, Iran
Oct. 2020- Nov. 2021

Undergraduate Research Assistant

Supervisor: Dr. Mohammad Reza Akbarzadeh Totonchi

B.Sc. Final Project: *Detecting and Distinguishing the Reasons for Infant Crying Using Environmental Sound Analysis*

- Created a custom dataset of crying sounds and their corresponding reasons.
- Preprocessed the audio signal and extracted features such as MFCC.
- Developed deep classifier models based on Convolutional Neural Networks (CNN) and Long Short-Term Memory (LSTM).
- Presented the findings as an oral presentation at the 9th Iranian Joint Congress on Fuzzy and Intelligent Systems (CFIS) in 2022.

Dependable Distributed Embedded Systems (DDEmS) Laboratory
Ferdowsi University of Mashhad

Mashhad, Iran
Jun. 2018- Jul. 2019

Undergraduate Research Assistant

Advisor: Dr. Yasser Sedaghat

Conducted research on various projects related to electronic systems in drones

- Contributed to a collaborative project on building a firefighter drone, which aimed to provide a novel solution for extinguishing fires in hard-to-reach areas.
- Conducted a project on connecting RC transmitter and receiver and interfacing the receiver with STM32 microcontroller and Arduino.

TEACHING EXPERIENCES

Computational Neuroscience, Iran University of Science and Technology

Tehran, Iran
Winter 2023

Teaching assistant, Dr. Mohammad Reza Daliri

- Held tutorial classes.
- Mentored and graded final projects.

Electronics I, Ferdowsi University of Mashhad

Mashhad, Iran
Fall 2019

Teaching assistant, Dr. Maryam Gharaei J.

- Held problem solving sessions and tutorial classes on Pspice.

Work Experiences

Sunflower Industrial Research Company (SIRCo)

Mashhad, Iran
Jun. 2022- Aug. 2022

Data Scientist

- Developed various state-of-the-art Machine Learning (ML) and Deep Learning (DL) models and classic algorithms for long-term and short-term electrical load forecasting in Pahbar software, which resulted in reducing the Mean Absolute Percentage Error (MAPE) from 1.3 to between 0.9% and 1.1%.
- Analyzed the results using statistical tests, correlation analysis, error analysis, and presented the key patterns and insights using various data visualization techniques
- Conducted a comprehensive code analysis, refactoring, and documentation for the old version of Pahbar software.
- Collaborated with senior managers in the presentation of Pahbar software for receiving government grants.

Rebike Startup

Mashhad, Iran
Sep. 2019- Jan. 2021

Co-founder & CEO

- Built easy install e-bike conversion kit that turns any bicycle into an electric one.
- Received $9,300 investment and mentorship services from Trig Up accelerator for 15% equity, after pitching our project and demonstrating our minimum viable product (MVP).

Khorasan Razavi Power Distribution Company

Mashhad, Iran
Spring 2021

Intern

- Conducted research on intelligent metering of electrical consumption.
- Learned about the role of each team of the company in the process of power generation from the power plant to the home and prepared the company brochure.

Jarfabin

Mashhad, Iran
Summer 2018

Intern

- Searched for various startup ideas related to artificial intelligence, such as computer vision, natural language processing, machine learning, etc., and documented them for the research and development team.

Skills

Programming Languages: Python, MATLAB, C

Tools & Frameworks: Machine Learning (PyTorch, Keras, TensorFlow, Hugging Face, Transformers, Captum, Scikit-learn, XGBoost); Natural Language Processing (spaCy, librosa); Brain Imaging (Nilearn, MNE, himalya); Data analysis and Visualization (Scipy, NumPy, Pandas, Matplotlib, seaborn)

Hardware Description Languages (HDL): Verilog, VHDL

Electronics: Altium Designer, OrCAD PSpice, Multisim, Proteus

Others: Git, DataLad, Poetry, Linux

Languages

English: Full professional proficiency, planned to take IELTS in October 2023

French: Elementary proficiency

Persian: Native

NOTABLE PROJECTS

Investigating the Effect of Chemogenetic Suppression of the mPFC in Reward Time Prediction of Dopaminergic Neurons in Mouse Ventral Tegmental Area (VTA) Using Spiking Activity Data

Final project of computational neuroscience course, Iran University of Science and Technology Winter 2022.

- Analyzed spike data (raster plot, peri-stimulus histograms, etc.) in Python.
- Predicted reward expectancy for a novel stimulus and reward pair.

Increasing the Frame Rate of Echocardiography Based on Large Motion Frame Interpolation

Final project of image processing course, Iran University of Science and Technology, Fall 2022.

- Used FILM (Frame Interpolation for Large Motion) neural network of Google.

Brain Computer Interface Course Assignments

Iran University of Science and Technology, Fall 2022.

- Continuous Decoding of Hand Movements
- SSVEP Classification
- Solving the Blind Source (BSS) Problem Using Canonical Correlation Analysis (CCA)
- Applying Data-independent (CAR; Small and Large Laplacian) and Data-dependent (FBCSP; CCSP; RCSP) Filters for Classification of Motor Imagery

Stock Market Forecasting

Freelance project at Karlancer website.

- Used time series analysis with LSTM

Rahneshan Competition

Designing and Implementing a Smart Device that Decodes Baby Cries

- Used machine learning models such as SVM, KNN
- Cry sound was recorded by Ky037, and real-time data was transmitted to the server by Adafruit HUZZAH ESP8266 and MQTT protocol.

REFERENCES

Dr. Mohammad Reza Daliri

(M.Sc. Thesis Supervisor)

Rank: Full Professor

Email: daliri@iust.ac.ir

Webpage: https://its.iust.ac.ir/profile/en/daliri

Location: Electrical Engineering Department, Iran University of Science and Technology

Dr. Yadollah Yaghoobzadeh

(M.Sc. Thesis Co-supervisor)

Rank: Assistant Professor

Email: y.yaghoobzadeh@ut.ac.ir

Webpage: https://ece.ut.ac.ir/en/~105908695

Location: School of Electrical and Computer Engineering, University of Tehran

Dr. Mohammad Reza Akbarzadeh Totonchi

(B.Sc. Final Project Supervisor)

Rank: Full Professor

Email: akbazar@um.ac.ir

Webpage: https://prof.um.ac.ir/akbazar

Location: School of Electrical and Computer Engineering, Ferdowsi University of Mashhad