MohammadAmin Alamalhoda

Undergraduate student
Electrical & Engineering
at Sharif University of Technology

Elecrtical Department
Sharif University of Technology
Tehran, IRAN
Mob.: +98 9396753219
Email.:**ma.alamalhoda@gmail.com**
Web.:**ee.sharif.ir/ amin**

Education

2018-Present
B.TECH. IN EE
Sharif University of Technology
Overall GPA: 3.5/4

2016-2018
HIGH SCHOOL
Mofid High School
Overall GPA: 4/4

Skills

PROGRAMMING LANGUAGES

C/C++ (Highly Skilled)
Python (Highly Skilled)
MATLAB (Highly Skilled)
SQL

LANGUAGES

Persian (Native)
English (Second Language)

OTHERS

TeamWork
Signal Processing
EEG Data Analysis
EEG data Acquisition
EEGLab (As an Analysis Tool)
Git
LaTeX
Arduino
Verilog
Linux (Ubuntu-Kali)
Linux Servers (CentOS-RedHat)
FrontEnd (HTML-CSS-Js)
BackEnd (Flask-Django)
Database (MySQL-MariaDB)
Graphic Designing (Adobe Photoshop)

Links

Personal Website: **click here**
LinkedIn: **click here**
Email: **click here**
Github: **click here**
Twitter: **click here**

Experiences

2020-Present **Research Assistant** — **AIRLab**

At Sharif University AIRLab, I am working on Brain Entrainment and Alzheimer's Disease therapy using EEG-based tasks.

2020-Present **Teacher Assistant** — **Neuroscience of Learning, Memory and Cognition**

Computational Neuroscience course for MS students Presented by Sharif University Electrical Engineering Department

2021-Present **Teacher Assistant** — **Signals and Systems**

Signal and Systems course for BS students Presented by Sharif University Electrical Engineering Department

2019-Present **Teacher Assistant** — **C/C++ Programming**

C/C++ course for new entries Presented by Sharif University Electrical Engineering Department

2021-Present **Developer** — **NaadSecure.ir**

Member of development team as C++ and Python developer

2021-Present **Image Processing Intern** — **NabzGroup.com**

R&D team member as an Image processing intern with focus on ultrasound Images enhancement using classic methods and convolutional neural networks (CNN)

2020-2021 **Software Engineer** — **AcoChain.ir**

Senior member of R&D team implementing financial analysis algorithms using Python and taking care of company servers as a sysadmin

2020-Present **Founder** — **MedAI Scanner**

MedAI bot - Telegram Bot for fast document scanning using Image processing techniques

Summer 2020 **Instructor** — **Workshop Instructor**

Sharif University Electrical Engineering Department, Summer 2020 Online MATLAB Workshop

Summer 2019 **Web Programming Intern** — **BonusCo.ir**

Frontend and backend web programming intern working on company website containers

2018-2020 **Graphic Designer** — **Resana**

Senior Graphic Designer at Resana Association (Sharif University Electrical Engineering Department Association)

Papers

2021 **Brain Entrainment for AD Therapy** — Alzheimer's Association International Conference

A Natural Substitute for Entraining the Brain Oscillations in AD Therapy: Canary Song

Finding therapies in nature would be inspiring. We used natural sound from the environment by relevant influences to well-used synthetic 40Hz auditory tone. Also, similar voices like canary, cricket, and woodpecker are good candidates for entraining the brain. Anyway, there is an unwritten law that says everything is better in its natural form.

Accepted in journal, currently waiting for publication and poster presentation.

Selected Research Projects

2021-Present **Natural Songs Effect on Brain Oscillations and AD Therapy** — AIRLab

Determining how natural songs such as bird's song (canary) and back shield insect sound affect brain oscillations which cause brain entrainment with natural frequencies that are good for preventing Amyloid deposition in neurons using EEG data acquisition of healthy and AD subjects.

2021-Present **Design an Algorithm for Predicting the Time of Inhalation** — AIRLab

AIRLab olfactometer had a lack of a breathing sensor to predict the time of exhalation for the most efficient scent releasement. The sensor was made by two iron plates located in a belt shape suit and are placed on the chest and the back of subjects. I am currently working on enhancing the SNR of this sensor and designing an algorithm for predicting the time of inhalation from exhalation.

2020-2021 **Building a new Model for Inhibitory and Excitatory Neurons** — AIRLab

Tryin to make a new population-based neural model for inhibitory and excitatory neurons using phase plane analysis for simulating Alzheimer's disease by computational methods and python Brian2 neural activity simulator package.

This research was discontinued due to supervisor advice.

2020-2021 **Analysing Auditory and Visual Stimuli effect on Brain Entrainment** — AIRLab

We are analyzing auditory and visual stimuli (single auditory stimuli, single visual stimuli, simultaneous auditory and visual stimuli) effect on brain entrainment for preventing Alzheimer's disease or slowing down its speed using EEG data acquisition of healthy and AD subjects and time-frequency signal processing methods.

Selected Course Projects

2021 **Music Genre Effect on Brain Waves Band Power** — **Foundation of Neuroscience**

EEG data acquisition of subjects listening to genres of music, preprocessing of the EEG signals using EEGLAB toolbox and determining the effect of genres on band power using different processing methods.

2021 **Registration of Spinal Cord MRI** — **Medical Images Analysis and Processing**

Designing new methods for Registration of spinal cords to Atlas image. I designed two new techniques: Polynomial fitting registration and Cascade feedforward neural network registration using inputs made by PAR and CPD.

2020 **Dynamics of Computational Neuron Models** — **Neuroscience of Learning, Memory and Cognition**

Simulation of different neuron models (H-H, IF, AdEx) and neural populations using python and phase-plane analysis.

2020 **Logic Gates Neural Network** — **Neuroscience of Learning, Memory and Cognition**

Implementation of a 3 layer Neural Network that can implement all logic gates using the back propagation method for updating weights using Python.

2020 **EEG Signal Processing** — **Signals and Systems**

Processing of EEG signals gathered from subjects looking at words on a screen to determine what specific word is being shown to the subject using feature extraction and linear regression models.

2020 **OCR** — **Signals and Systems**

Implementation of optical character recognition for detecting driving signs during virtual self-driving car simulations.

2020 **Object Detector** — **Signals and Systems**

Detecting all objects in a video using YOLO weights for real-time object tracking (objects such as persons, dogs, cars, cats, airplanes, and ...) and counting people who are in the same place from arrival to departure

2020 **Geometrical Shapes Detector and Basic Image Processing** — **Signals and Systems**

Detecting geometrical shapes with different sizes in an image and basic image segmentation K-means and OTSU algorithms, edge detection in image using Sobel, Kirsch, and LoG operators, and image denoising.

2021 **OPAMP Designing** — **Principles of Electronic**

I Designed a 3-stage Operational Amplifier with great amplitude gain using differential stages and BJT transistors.

2020 **UART** — **Computer Architectures**

Implementation of Universal Asynchronous Receiver Transmitter designed using Verilog HDL.

Honors

2018 **Mathematics and Physics Konkur** **Awarded**

Ranked 199 out of 400,000 participants (Konkur is Iranian University Entrance Exam)

2018 **CrossFit competition** **Awarded**

ranked 3rd out of 20 participants in Shiroodi CrossFit event.

Selected Courseworks

GRADUATE COURSES

- Neuroscience of Learning, Memory and Cognition [Prof. Hamid Aghajan] 20/20
- Medical Imaging Systems [Prof. Vosoughi Vahdat] 19/20
- Medical Image Analysis and Processing [Prof. Emad Fatemizadeh] 17.2/20

UNDERGRADUATE COURSES

- Foundation of Neuroscience [Prof. Ali Ghazizadeh] 19.4/20
- Signal and Systems [Prof. Hamid Aghajan] 17/20
- Engineering Mathematics [Prof. Hamid Aghajan] 17.5/20
- Logic Circuits and Digital Systems [Prof. Mahdi Shabany] 18.5/20
- Computer Architectures [Prof. Khosro Hajsadeghi] 18/20
- Principles of Electronic [Prof. Zahra Kavehvash] 18/20
- Numerical Computation [Prof. Siavash Bayat] 17/20
- Differential Equations [Prof. Bijan Zanganeh] 17/20
- C/C++ Programming [Dr. Taherkhani] 20/20

* For more informations about my Projects and papers please check my website: **click here**