Seyed Soroush Majd

Contact Information

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Research Interests

- Machine Learning
- Computer Vision
- Artificial Intelligence in Medicine
- Deep Learning
- Natural Language Processing
- Biomedical Signal and Image Processing

Education

- **Shahid Beheshti University**, Tehran, Iran

  M.Sc., Artificial Intelligence, September 2021–Present
  Overall GPA: **16.71**/20 (**4**/4)

- **Amirkabir University of Technology (Tehran Polytechnic)**, Tehran, Iran

  B.Sc., Biomedical Engineering - Bioelectrics, September 2016–October 2021
  Last Two Years' GPA: **17.01**/20 (**3.68**/4)
  Overall GPA: **16.04**/20 (**3.37**/4)
  Thesis: Heart Rate Measurement and Blood Perfusion Mapping in Parts of Human Body Skin using rPPG
  Supervisor: Dr. Vahidreza Nafisi

- **Allameh Helli High School**, Tehran, Iran
  Affiliated with the National Organization for Development of Exceptional Talents (NODET)

  Diploma in Mathematics and Physics October, 2012–June 2016
  Overall GPA: **19.68**/20 (**4**/4)

Relevant Coursework

Shahid Beheshti University

- Deep Learning (4/4)
- Machine Learning (4/4)
- Pattern Recognition (4/4)
- Neural Networks (4/4)

Amirkabir University of Technology

- Linear Control Systems (4/4)
- Biostatistics & Probability (4/4)
- Principles of Rehabilitation (4/4)
- Microprocessor and Assembly Language (4/4)
- Microprocessor and Assembly Language Lab (4/4)
- Fundamentals of Image Processing (4/4)
- Data Structures and Algorithms (4/4)
- Computer Programming (4/4)

Teaching Experience

Teaching Assistant, Department of Computer Engineering, Amirkabir University of Technology

- Computer Architecture, Instructor: Prof. Hamed Farbeh (Spring 2022)
- Microprocessors and Assembly Language, Instructor: Prof. Hamed Farbeh (Fall 2019)

Research Experience

Research Assisstant, Iranian Research Organization for Science and Technology (IROST) (April 2022–Present)

- Researched different rPPG signal extraction methods using videos from the skin at different light wavelengths to map blood flow below the skin with the cooperation of The Color and Visual Computing Laboratory (Colourlab) at the Norwegian University of Science and Technology (NTNU).
  Supervisor: Prof. Vahidreza Nafisi

Bachelors Research, Amirkabir University of Technology (October 2020–October 2021)

- Estimated the heart rate and mapped blood flow below in the skin using facial videos with a cheap and non-invasive method called rPPG (Remote Photoplethysmography). Involves detecting the Region of Interest (ROI) (using Neural Network, Thresholding, and Manual Selection), extracting the rPPG signal from the ROI (using two methods of calculating the average pixel intensity and Independent Component Analysis (ICA)), and calculating the Fourier Transform of the rPPG signal to identify the frequency with the highest amplitude as the estimated heart rate.
  Supervisor: Prof. Vahidreza Nafisi

Selected Projects

- **Image Colorization with Convolutional Neural Network**
  Deep Learning Course Project (Github Link)
  Implemented in PyTorch based on the CIFAR-10 dataset.
- **Tata Steel Ltd. Stock Price Prediction Using Hidden Markov Model**
  Machine Learning Course Final Project (Github Link)
  Implemented a Machine Learning model based on the ideas presented in a paper entitled "Stock Price Prediction Using Hidden Markov Models".
- **Text Classification on WELFake Dataset with BERT and RoBERTa**
  Deep Learning Course Project (Github Link)
  Fine-tuned BERT and RoBERTa in PyTorch to classify fake news.
- **Multi-Layer Perceptron for Image Classification**
  Deep Learning Course Project (Github Link)
  Classified Sign Language Symbols with MLP Network in PyTorch.
- **Comparing Object Recognition in Humans and Deep Convolutional Neural Networks Based on Kay et al. (2008)**
  Neuromatch Academy Deep Learning Course Final Project (Link to certificate)
  Implemented using PyTorch and TensorFlow.
- **Human Activity Recognition with Bi-directional CNN-LSTM**
  Neural Networks Course Final Project (Github Link)
  Implemented in TensorFlow based on the PUC-Rio dataset.
- **Google Stock Price Prediction Based on GRU and LSTM Models**
  Deep Learning Course Project (Github Link)
  Implemented various GRU and LSTM models with TensorFlow.
- **Earthquake Prediction in Iran using Machine Learning Techniques**
  Pattern Recognition Course Final Project (Github Link)
  Predicted earthquakes at a specific time based on the arrangement of the solar system's planets.

Skills

- **Programming Languages:** Python, MATLAB, C++, SQL
- **AI and Data Science:** PyTorch, TensorFlow, NumPy, Matplotlib, Scikit-Learn, SciPy, Pandas, OpenCV, Dlib
- **Miscellaneous:** Git, LaTeX
- **Web Development:** HTML, CSS
- **Operating Systems:** Linux, Windows
- **Hardware:** Proteus, Arduino, Assembly, CUDA, Verilog

Professional Development

- **Deep Learning Course (in English) - Neuromach Academy**, (July 2022)
  The DL course provided an integrated, scientific inquiry-based curriculum with instruction in core topics of Deep Learning and Neural Networks. such as Optimization, Regularization, Recurrent Neural Networks, Generative Models, Unsupervised Learning, and Reinforcement Learning (The syllabus for 2022).
  (Link to certificate)
- **MATLAB Course - BME Students' Scientific Association**
- **HTML and CSS Course - CE Students' Scientific Association**

Honors And Awards

- Achieved **top 1%** place among all applicants of the Nationwide University Entrance Exam (Konkour) for B.Sc. in Engineering among 162,879 applicants, Iran, 2016.
- Best Project Award, NODET Seminar of Science and Technology, for project "Valveless Pulse jet", Allame Helli High School, Tehran, Iran, 2015.
- Member of National Organization for Development of Exceptional Talents (NODET), Tehran, Iran, 2012–2016.

Languages

- **Persian** (Farsi): Native
- **English**: Fluent

References

- **Vahidreza Nafisi, Associate Professor**
  Biomedical Engineering Department, Amirkabir University of Technology
  Head of Biomedical Research Group at IROST
  Email: vr_nafisi@irost.org
- **Hamed Farbeh, Assistant Professor**
  Computer Engineering and IT Department, Amirkabir University of Technology
  Email: farbeh@aut.ac.ir
- **Reza Tavasoli, PhD Candidate**
  Computer Science and Engineering Department, University of South Carolina
  Email: tavasoli@email.sc.edu