Seyed Soroush Majd

Contact Information

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Research Interests

- Natural Language Processing
- Machine Learning
- Trustworthy AI
- Deep Learning

Education

- **Shahid Beheshti University**, Tehran, Iran
  M.Sc., Artificial Intelligence, September 2021–Present
  Overall GPA: **17.86**/20, **4**/4 (Calculated by iGPA, WES tools)
  Thesis: Improving Semantic Textual Similarity Using Deep Learning
  Supervisor: Professor Mehrnoush Shamsfard
- **Amirkabir University of Technology (Tehran Polytechnic)**, Tehran, Iran
  B.Sc., Biomedical Engineering - Bioelectrics, September 2016–October 2021
  Last Two Years' GPA: **17.01**/20
  Overall GPA: **16.04**/20
  Thesis: Heart Rate Measurement and Blood Perfusion Mapping in Parts of Human Body Skin using rPPG
  Supervisor: Professor Vahidreza Nafisi
- **Allameh Helli High School**, Tehran, Iran
  Affiliated with the National Organization for Development of Exceptional
  Diploma in Mathematics and Physics October 2012–June 2016
  Overall GPA: **19.68**/20

Relevant Coursework

Master's in Artificial Intelligence

- Deep Learning (17.3/20)
- Machine Learning (16.8/20)
- Digital Signal Processing (19/20)
- Principles of Algorithms (20/20)
- Pattern Recognition (16.75/20)
- Natural Language Processing (17/20)
- Knowledge and Ontology Engineering (19.25/20)
- Trustworthy AI (Visiting student at University of Tehran, 19.4/20) (ABET)

Bachelor's in Biomedical Engineering

- Linear Control Systems (19/20)
- Biostatistics & Probability (19/20)
- Data Structures and Algorithms (17/20)
- Principles of Rehabilitation (18.05/20)

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)

Publications

- **HmBlogs: A big general Persian corpus** (Ongoing)
  Participating in the ongoing BERT pretraining project using the HmBlogs corpus to advance Persian NLP. Contributing to data preprocessing, model fine-tuning, and model performance evaluation with the ultimate goal of completing the HmBlogs paper. (Link to HmBlogs Paper).
  Supervisor: Prof. Mehrnoush Shamsfard

Research Experience

Graduate Research, Natural Language Processing Lab (August 2023–Present)

- Improving clinical Semantic Textual Similarity (STS) using metric learning. Developing training strategies to enhance model representation to overcome challenges such as limited clinical data. (Link to Proposal in English)
  Supervisor: Professor Mehrnoush Shamsfard

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

- 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: Professor Vahidreza Nafisi

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

- Estimated the heart rate and mapped blood flow below the skin using facial videos with a non-invasive method called rPPG. (Link to Thesis File in Persian)
  Supervisor: Professor Vahidreza Nafisi

Selected Projects

- **High-Accuracy FAQ Question Answering using Metric Learning (Angular Loss) and SPARQL-Based Ontology Querying.**
  Knowledge and Ontology Engineering Course Final Project (Github Link) (Report in English)
  Implemented in PyTorch with PyTorch Metric Learning Library
- **Evaluating Fairness, Backdoor Attack, and Out-Of-Distribution Detection in ResNet18 Image Classification**
  Interpretable AI Course Project (Github Link) (Report in English)
- **Model Interpretation using SHAP for Regression (MLP) and LIME for Image Classification (MobileNet v2)**
  Interpretable AI Course Project (Github Link) (Report in English)
- **Enhancing Robustness and Generalization in ResNet18 Classification with Angular Loss on Limited Training Data (20% of CIFAR-10 dataset)**
  Interpretable AI Course Project (Github Link) (Report in English)
  Implemented in PyTorch with PyTorch Metric Learning Library
- **Question Answering Using Cosine Similarity Between Input Questions and Constructed Sentences (Subject, Object, Predicate) from Ontology.**
  Knowledge and Ontology Engineering Course Final Project (Github Link) (Report in English)
- **Comparing Performance of Contextual and Static Embeddings in Analogical Reasoning Tasks.**
  Natural Languege Processing Course Project (Github Link)
- **Text Classification on WELFake Dataset with BERT and RoBERTa**
  Deep Learning Course Project (Github Link)
- **Multi-Layer Perceptron for Image Classification (Sign Language Symbols)**
  Deep Learning Course Project (Github Link)
- **Google Stock Price Prediction Based on GRU and LSTM Models**
  Deep Learning Course Project (Github Link)
  Implemented various GRU and LSTM models with TensorFlow.

Skills

- **Programming Languages:** Python, MATLAB, C++, SQL
- **AI and Data Science:** PyTorch, TensorFlow, NumPy, Matplotlib, Scikit-Learn, Pandas, PyTorch Metric Learning
- **Web Development:** HTML, CSS
- **Hardware:** Proteus, Arduino, Assembly, Verilog, LTspice
- **Miscellaneous:** Git, LaTeX

Professional Development

- **Deep Learning Course - 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)

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.
- Member of National Organization for Development of Exceptional Talents (NODET), Tehran, Iran, 2012–2016.

Languages

- **Persian**: Native
- **English**: Fluent (Scheduled **TOEFL iBT** for November 1, 2023)

References

- **Mehrnoush Shamsfard, Associate Professor**
  Computer Science and Engineering Department, Shahid Beheshti University
  Email: m-shams@sbu.ac.ir
- **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