Melika Mohammadi Fakhar

Computer Science Student

Tehran, Iran

melikamfakhar@gmail.com

Education

IUST University (Ranked among the top 5 universities in Iran) *Tehran, Iran*

B.Sc. in Computer Science at Iran University of Science & Technology *Sep. 2020- Present*

- CGPA: **3.84/4 (18.17/20)**
- Ranked among the top **10%** in GPA at IUST
- Related Courses: Artificial Intelligence (**19.95/20**), Deep Learning (**18.9/20**), Natural Language Processing (**18.56/20**), Computer Vision (**17.3/20**), Graph Theory and Algorithms (**19.5/20**)

Farzanegan High School *Qom, Iran*

- Diploma in Mathematics and Physics *2016-2020*
- CGPA: **4/4 (19.87/20)**

Research Interests

- **Natural Language Processing**
  Question Answering Systems, Language Modeling, Dialog Systems and Chatbots, Information Retrieval and Extraction
- **Deep Learning**
  Neural Network Architectures, RNNs, GANs, Transfer Learning
- **Machine Learning**
  Model Interpretability and Explainability, Hyperparameter Optimization
- **Computer Vision**
  Object Detection and Recognition, Image Segmentation, Medical Image Analysis

Research Experiences

Natural Language Processing Research Assistant *IUST*

Bachelor Thesis, School of Computer Engineering *April 2024 - Present*

- Thesis Title: Leveraging Multi-Modal RAG for Enhanced Medical Image Analysis
- Supervisor: Dr. Sauleh Eetemadi

Natural Language Processing Intern *IUST*

Summer Internship, School Of Computer Engineering *June. 2023 - Sept. 2023*

- Developed and implemented deep learning models for Visual Dialogues tasks.
- Preprocessed and annotated large datasets to enhance model accuracy.
- Supervisor: Dr. Sauleh Eetemadi

Academic Experiences

Teaching Assistant *IUST*

- Deep Learning - Instructor: Dr. Marzieh Davoodabadi Farahani *Fall 2024*
- Artificial Intelligence - Instructor: Dr. Mohammad Reza Mohammadi *Fall 2024*
- Software Engineering - Instructor: Dr. Mehrdad Ashtiani *Fall 2024*
- Operating Systems - Instructor: Dr. Reza Entezari *Spring 2024*
- Discrete Mathematics - Instructor: Dr. Vesal Hakami *Spring 2024*
- Database Design - Instructor: Dr. Hossein Rahmani *Fall 2023*

- Operating Systems - Instructor: Dr. Reza Entezari *Fall 2023*
- Compiler Design - Instructor: Dr. Saeed Parsa *Fall 2023*
- Logic Circuits - Instructor: Dr. Amir Mahdi Hosseini Monazzah *Spring 2023*
- Fundamentals of Programming - Instructor: Dr. Sauleh Eetemadi *Fall 2022*
- Advanced Programming - Instructor: Dr. Sauleh Eetemadi *Spring 2022*
- Fundamentals of Programming - Instructor: Dr. Sauleh Eetemadi *Fall 2021*

Academic Projects

Keyword-Based Content Summarization on CNN DailyMail using RAG [link] *Spring 2024*
Natural Language Processing Course Project
- Developed a text extraction and chunking mechanism to process large text documents.
- Leveraged retrieval-augmented generation techniques to improve summarization accuracy.
- Models:
  Retriever: all-MiniLM-L6-v2
  Generators: GPT-2, BART-large, T5-small
- Technologies: Python, llama-index, Transformers, Clean-Text.

Question Answering on Persian Data [link] *Spring 2024*
Natural Language Processing Course Project
- Implemented and fine-tuned retrieval-augmented generation models for question answering on Persian text.
- Evaluated model performance using metrics such as accuracy, precision, recall, and F1-score.
- Models:
  Retriever: all-MiniLM-L6-v2
  Generator: GPT-2
- Technologies: Python, Transformers, Accelerate, Bitsandbytes, Hazm, Clean-Text, docx2txt.

Anti-Spoofing Algorithm for Facial Recognition: Liveliness Detection in Videos [link] *Spring 2024*
Computer Vision Course Project
- Implemented a facial liveliness detection algorithm to distinguish between real and spoofed faces in a video.
- Used Convolutional Neural Networks (CNNs) and transfer learning with VGG16 for feature extraction and classification.
- Used CASIA-FASD dataset for training and evaluation.
- Evaluated performance using metrics such as accuracy, precision, recall, and F1-score.
- Technologies: Python, OpenCV, TensorFlow, Keras, VGG16.

Sentiment Analysis on Persian Corpus [link] *Fall 2023*
Deep Learning Course Project
- Preprocessed ArmanEmo dataset by cleaning, normalizing, and stemming text using Parsivar.
- Implemented DistilBERT for feature extraction and classification.
- Evaluated performance with accuracy, precision, recall, F1-score, and confusion matrix.
- Technologies: Python, Parsivar, DistilBERT, scikit-learn, PyTorch.

NoWaste [link] *Fall 2023*
Software Engineering Course Project
- Participated as a back-end developer in developing NoWaste, a web application aimed at minimizing food waste by connecting restaurants and cafes with surplus food to potential consumers.
- Designed and implemented RESTful APIs to facilitate efficient data exchange between frontend and backend systems.
- Dockerized the application to streamline deployment and ensure consistency across development and production environments.
- Developed and maintained CI/CD pipelines, automating testing, building, and deployment processes to enhance development efficiency and ensure robust application delivery.

Accordion: Music Streaming Web Application [link] *Fall 2023*
System Design and Analysis Course Project
- Contributed to the design and development of Accordion, a web application for streaming and managing music, akin to Spotify.
- Developed responsive and interactive user interfaces using React, JavaScript, HTML5, and CSS3.

Theory of languages and Automata [link] *Spring 2022*
TLA Course Projects
Implementing tools for converting Non-deterministic Finite Automata to Deterministic Finite Automata, check string acceptance in finite automata, Turing Machine operations, Pushdown Automaton (PDA) calculator for analyzing context-free languages.

Skills

Programming: Python, C, C++, C#, Java, JavaScript, SQL
Libraries and Frameworks: PyTorch, Keras, TensorFlow, Pandas, Scikit-learn, NumPy, NLTK, Django
Technologies: Git, Docker, Postman, Azure DevOps, Jupyter Notebook

Interpersonal Skills: Teamwork, Teaching, Self-Learning, Problem Solving
Operating Systems: Linux (Ubuntu), MacOS, Windows

Honors And Certificates

- **Ranked among the top 10% in GPA within the Computer Engineering faculty at IUST.**
- **Ranked within the top 0.1% in the Iranian University Entrance Exam for Mathematics and Physics majors.**
- **Accepted in the first round of the Iranian Mathematics Olympiad.**

- **Natural Language Processing Specialization Certificate from Coursera.** *Sep. 2023*
  Natural Language Processing with Classification and Vector Spaces - View Certificate

- **Deep Learning Specialization Certificate from Coursera.** *Aug. 2023*
  Neural Networks and Deep Learning - View Certificate

- **Data Structures and Algorithms Specialization Certificate from UC San Diego.** *Spring 2022*
  - Algorithms on Strings - View Certificate
  Covering advanced string algorithms, pattern matching, suffix structures, and their applications in text processing and bioinformatics.
  - Algorithms on Graphs - View Certificate
  focusing on graph traversal, shortest paths, minimum spanning trees, and network flow algorithms.
  - Data Structures - View Certificate
  including in-depth study of arrays, linked lists, stacks, queues, hash tables, and trees.
  Algorithmic Toolbox - View Certificate
  focusing on fundamental algorithms, divide and conquer strategies, dynamic programming, and greedy algorithms.

Languages

- **Persian:** Native
- **English:** Fluent (Expected IELTS Score of **7.0**, exam to be taken in the near future)

Membership

- **Elected Member, Computer Engineering Scientific Association of IUST** *Spring 2022 - Fall 2023*
  Actively involved in organizing key events such as the Summer Bootcamp for Web Development, orientation ceremonies for new students, and various educational courses and workshops.

References

Dr. Sauleh Eetemadi
Assistant Professor in the Department of Computer Engineering, Iran University of Science and Technology and University of Birmingham
Email: s.eetemadi@bham.ac.uk

Dr. Behrooz Minaei-Bidgoli
Professor in the Department of Computer Engineering, Iran University of Science and Technology
Email: b_minaei@iust.ac.ir

Dr. Reza Entezari-Maleki
Assistant Professor in the Department of Computer Engineering, Iran University of Science and Technology
Email: entezari@iust.ac.ir