Mohammad Javad Ranjbar

+98-9120657462 Mohammadjavadranjbarkalahroodi@gmail.com MohammadJ MohammadJRanjbar

Research Interests

- Machine Learning
- Computer Vision
- Speech recognition
- Deep Learning
- Natural Language Processing
- Human–Computer Interaction

Education

University of Tehran, Tehran-Iran **2022 – Present**

Master of Science in Computer Software Engineering *GPA: 4/4 (18.7/20)*

Supervisors: Dr. Heshaam Faili and Dr. Azadeh Shakery

Amirkabir University of Technology, Tehran-Iran **2016 – 2021**

Bachelor of Science in Electrical Engineering *GPA: 3.64/4 (17.1/20) via 67 passed credits*

Thesis: Facial Expression Recognition

Transfer learning has been used to fine-tune ResNet, and it has been implemented on a personal assistant robot. The robot reacts to its owner's emotions, shows various gestures, and is commendable in using speech to perform the task of playing music based on audience expressions. Additionally, a data mining app has been implemented to find emotions and relevant durations in videos.

Supervisors: Dr. Mohammad Bagher Menhaj and Dr. Hassan Taheri

Experience

University of Tehran **Tehran, Iran**

Teaching Assistant *Jan 2023 – Present*

- Machine Learning: Designed and developed the final project.
- Satanical Inference: Created and organized the first homework assignment.

Research Assistant

- Working as RA at Natural Language Processing Lab, contributing to my thesis and actively researching diverse NLP challenges, including chatbot development and wake word detection.

Amirkabir University of Technology(AUT) **Tehran, Iran**

Teaching Assistant *Oct 2021 – Jan 2022*

- Assisted in teaching Introduction to Computational Intelligence lab, providing guidance and instruction for the course's laboratory section.

Research Assistant *Sep 2020 - Sep 2022*

- Worked as a research assistant at the Computer Intelligence and Large Scale System Research Lab, focusing on my thesis on facial emotion recognition.

Member of the Executive Committee at Innovation Center *Jan 2019 – Jan 2020*

Sharif University of Technology **Tehran, Iran**

Research Assistant *Oct 2021 – Jan 2022*

- Contributed as a research assistant at the DML Lab.

Amirkabir Robotics and Programming School (FIRA Academy) **Tehran, Iran**

Instructor of Image Processing Course *2020 – 2021*

- Developed and delivered an engaging course on introduction to machine learning and computer vision, focusing on image processing concepts

Member of the Production Team of SWIMBot *March 2021*

- Contributed as a member of the Production Team of SWIMBot, a versatile platform for implementing various applications, including image processing, mapping, obstacle avoidance, and more.

International Conference on Robotics and Mechatronics **2019, 2021**

Member of Student Committee *Tehran, Iran*

Canavat Electric Iranian Arvand **Summer 2019**

Internship *Iran*

- Implemented a low-priced IR-remote dimmer with the help of Arduino Nano

Publication

Social robots: an open-source framework for personal assistant robots | *ICRoM 2022* **Oct 2022**

Mohammad Javad Ranjbar, MB. Menhaj, H. Taheri.

Selected Courses

- Machine Learning 4/4 (20/20)
- Statistical Inference 4/4 (19.2/20)
- Algorithm Design 4/4 (17/20)
- Natural language processing 4/4 (18.2/20)
- Computational intelligence 4/4 (17/20)
- Computational intelligent lab 4/4 (20/20)

Online Courses

- Machine Learning [Certificated]
- Deep Learning Specialization [In-progress]
- Algorithms Specialization [In-progress]
- Natural Language Processing [In-progress]

Technical Skills

Languages/Database: Python (Pytorch, Tensorflow, Keras, NLTK, OpenCV, SciPy, Scikit-learn, Pandas, Matplotlib, Numpy, Pygame, Pyaudio, Threading, PyQt, Xlsxwriter), R, C/C++, C, Matlab, VHDL, Assembly, HTML, MySQL, LaTeX

Simulation Tools and hardware: ARM (STM32), Arduino, Raspberry Pi, NodeMCU, Simulink, Proteus, H SPICE, Advanced Design System

IDEs/Tools: Jupyter Notebook, Google Colab, Visual Studio, Keil5, STM32 Cube MX, Microsoft Office (Word, Excel, PowerPoint), Adobe Photoshop, Adobe Premiere, Adobe Animate, After Effects, Unity, Git, Docker

Language: Persian (Native), English (Fluent), TOEFL Score: 107 (R: 29, L: 30, S: 24, W: 24)

Projects

FAQ chat bot | *Rasa, Bert, Python*— *Git* | *Telegram bot* **May 2023**

- FAQ chatbot specialized in selling airplane tickets, capable of detecting intents, classifying domains, and extracting slot values (e.g., destination city, date, etc.)
- Specialized FAQ chatbot providing responses to users seeking information on weight loss strategies, nutrition, fitness, and general healthcare inquiries.

Persian music dastgah detection | *Surfboard, Librosa, sklearn, Tensorflow, Python* — *Git* **Jan 2023**

- After preprocessing the gathered data, audio features such as zero-crossing rate and short-time Fourier transform, among others, have been extracted. Multiple models, including Neural Networks, Support Vector Machines, and others, have been trained for detecting Dastgath. Additionally, various clustering methods were employed.

Training robust model | *Cleverhans, Pytorch-metric-learning, PyTorch, Python*— *Git* **Mar 2023**

- A robust model was trained using data augmentation, and the exploration of the Angular loss function was conducted. Moreover, the model's resilience against fast gradient methods and its performance in the presence of noisy data were thoroughly examined.

Correction of skewed text | *Open-CV, Tensorflow, Python*— **Sep 2021**

- Developed a deep neural network using Self-Supervised Learning to accurately predict optimal page rotation angles of skewed text.

snake game with voice control and motion detection | *Pygame, Picovoice, Open-CV, Python* — *Git* **Apr 2020**

- The game was developed using the Pygame module and features voice control, trained with 4 wake words. Motion control is implemented by detecting movement of a designated color.

2x2 Rubik's cube solver | *C++*— *Git* **Mar 2020**

- The developed program allows user interaction with a 2x2 Rubik's Cube via command inputs. Color assignments provided by users are utilized in solving the Rubik's Cube using DLS (depth-limited search), with the required moves printed as output.

Face Recognition System | *Open-CV, Numpy*— *Git* **Mar 2020**

- Applying the Eigenfaces method to project and classify faces by comparing their positions in a subspace with those of recognized individuals.

Game recommender | *NLTK, Python* —*Git* **Mar 2021**

- Utilizing collaborative filtering for game recommendations by analyzing user history similarities.

Smart temperature control system using STM32 | *C*— *Git* **Dec 2020**

- Developed a smart temperature control system using STM32, LM35, and Stepper motor HCSR05 components. Integrated remote control for setpoint adjustment via an Arduino Due.

Music algorithm | *Matlab*— *Git* **Dec 2019**

- Implementing a music algorithm for estimating the Direction Of Arrival (DOA) in sound sources.

Honors

- Ranked within the top 0.5% (76th) among approximately 13000 participants in the computer engineering national master entrance exam for Iranian universities. 2022
- Ranked within the top 1% (35th) among approximately 2000 participants in the computer science national master entrance exam for Iranian universities. 2022
- Ranked within the top 0.6% (27th) among approximately 4000 participants in the information technology engineering national master entrance exam for Iranian universities. 2021
- Ranked within the top 0.25% in the nationwide entrance exam for B.Sc. degree among 163000 participants. 2016
- Accepted to take part in "Iranian Physics Olympiad stage 2" from top 5% of participants. 2015
- Accepted Three times to take part in "Iranian Olympiad on Astronomy and Astrophysics stage 2" from the top 5% of participants. 2013, 2015