Mohammad Javad Ranjbar | CV

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Research Interests

- Machine Learning
- Deep Learning
- Computer Vision
- Human–Computer Interaction
- Social Networks
- Natural Language Processing
- Generative Adversarial Networks
- Cognitive neuroscience
- Reinforcement Learning

Education

- **Master of Science** 2022 – present
  University of Tehran Tehran-Iran
  - Computer Engineering
- **Bachelor of Science** 2016 – 2021
  Amirkabir University of Technology Tehran-Iran
  - Electrical Engineering
    - Last 2 years GPA: : **3.64/4 (17.1)** via 67 passed credits
    - Overall GPA: 15.2/20
  - **Thesis Title: Facial Expression Recognition**
    I used transfer learning to finetune ResNet, and implemented it on a personal assistant robot. The robot reacts to its owner's emotion and shows various gestures and it is commendable using speech to perform the task of playing music based on audience expressions. Additionally, I implemented a data mining app that finds the emotions and the relevant durations in videos.
    Supervisors: Dr. Mohammad Bagher Menhaj and Dr. Hassan Taheri

Work Experience

- **Research Assistant at DML lab at Sharif University of Technology** Oct 2021 – Jan 2022
  - We were working on a food computing project in colaberation with University of California Irvine under supervision Dr. Hamid Reza Rabiee and Dr. Ramesh Jain
- **Teaching assistant for Introduction to Computational Intelligence Course** Oct 2021 – Jan 2022
  - Instructor: Dr. Heidar Ali Talebi (Amirkabir University of Technology)
- **Research Assistant at CILSS Lab at Amirkabir University of Technology** 2020 – 2022
  - I was working on my thesis project (facial expression recognition).
- **Machine learning Teacher at Amirkabir Robotics and Programming school (FIRA Academy)** 2020 – 2021
  - I designed and taught an introduction to machine learning and computer vision course
- **Member of the production team of SWIMBot** (Designed for **Diginext**) March 2021
  - SWIMBot is a platform for implementing various applications such as image processing, mapping, obstacle avoidance and more.
- **Innovation Center of Amirkabir University of Technology** 2019 – 2020
  - Member of executive committee.
- **International Conference on Robotics and Mechatronics** 2019 , 2021
  - Member of Student committee.
- **Internship at Internship at Canavat electric Iranian Arvand** Summer 2019
  - I used Arduino nano to designe a low priced IR-remote dimmer

Publications

- **Mohammad Javad Ranjbar**, MB. Menhaj, H. Taheri. "Social robots: an open-source architecture for personal assistant robots". (Accepted to be presented in The 10th RSI International Conference on Robotics and Mechatronics) ICRoM 2022

Selected Courses

- Introduction to Computational Intelligence 4/4
- Introduction to Computational Intelligent lab 4/4
- An Introduction to Machine Learning 4/4
- Microprocessor Systems & Interfaces with Lab 4/4
- Computer Programming 4/4
- Advanced Programming Passed

Online Courses

- Machine Learning [Certificated]
  - Instructors: Dr. Andrew Ng
  - Offered by: Stanford University
- Algorithms Specialization [In-progress]
  - Instructors: Dr. Tim Roughgarden
  - Offered by: Stanford University
- Deep Learning Specialization [In-progress]
  - Instructors: Dr. Andrew Ng
  - Offered by: Deeplearning.ai
- Reinforcement Learning Specialization [In-progress]
  - Instructors: Dr. Martha White, Dr. Adam White
  - Offered by: University of Alberta & Alberta Machine Intelligence Institute

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 top 5% of participants. 2013–2015

Technical & Personal Skills

- **Programming/Scripting:** Python *(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 HardWares:** 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)

Selected Projects

- **Correction of skewed text** DML lab [2021]
  - I trained a deep neural network which is able to predict the correct rotation angle of pages.
- **Prediction of application's category based on their description** Personal Project [2021]
  - I used NLTK and Hazm for Persian language and trained a deep learning model for predicting the category.
- **Game Recommender** Personal Project [2021]
  - Implementing collaborative filtering to recommend games to users, based on the similarity of users' history.
- **Self-driving Car** Personal Project [2021]
  - Using OpenCV to detect lanes and control the car movement in the Avis Engine simulator.
- **Word Embedding Visualization** Personal Project [2021]
  - Visualizing of 2D word embedding with PCA method on pre-traind GloVe vectors.
- **Snake game with Voice Control and Motion Detection** Advanced Programming [2020]
  - I implemented the game with the help of the Pygame module, for the Voice control I trained a model with 4 wake words, for motion control I detected the movement of a specific colour.

- **2x2 Rubik's Cube Solver** Advanced Programming [2020]
  - I implemented a program that users can play with 2x2 Rubik by typing commands. Also, users can give colors for the cube and the program will solve the Rubik using DLS(depth limited search) and will print the needed moves.
- **Face Recognition System** Advanced Programming [2020]
  - Projecting image of face to subspace and classifying the face based on comparing its position in the face space with the positions of the known individuals. (Eigenfaces method)
- **Irrigation System using STM32** Microprocessor Systems Interfaces [2020]
  - I used stm32, LCD, keypad and YL-69 to implement an irrigation system. The LCD shows the menu, the user can choose how long the irrigation should be, and YL-69 is used to find out the soil condition.
- **Smart Temperature Control System using STM32** Microprocessor Systems Interfaces [2020]
  - I used STM32, LM35, Stepper motor HCSR05 to make a smart temperature control system and also added a remote control to change setpoint using an Arduino Due.
- **Remote Dimmer** Internship Project [2020]
  - I designed a low priced IR-remote dimmer using Arduino nano.
- **Handwriting Digit Recognition** Introduction to Machine Learning [2019]
  - I used Mnist dataset to train different convolutional neural network (CNN) with different activation functions and learning rates and compared their effects on loss and accuracy.
- **Fruit Classification using Deep Learning** Introduction to Computational Intelligence [2019]
  - I trained a Convolution Neural Network (CNN) with help of TensorFlow, for 4 different fruit and achieved high accuracy on test data. Additionally, I used a pre-trained YOLO network for real-time fruit classification.
- **Titanic: Machine Learning from Disaster** Introduction to Computational Intelligence [2019]
  - Implementing this project consisted of preprocessing the data and eliminating irrelevant features. Then training machine learning models (Decision Tree, KNN, etc.) to achieve high accuracy.
- **Music algorithm** Linear Algebra [2019]
  - Implementing Music algorithm for Direction Of Arrival (DOA) estimation

For further information, and proofs check my Gitub