Amirhossein **Mesbah**

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"Be the change that you want to see in the world."

Education

University of Tehran — *Tehran, Iran*

M.Sc. in Artificial Intelligence and Robotics — *2020 - present*

- Overall GPA: 19.48/20 (4/4)

University of Tabriz — *Tabriz, Iran*

B.S. in Computer Engineering — *2016 - 2020*

- Thesis: news scrapping dashboard using Scrappy and Django frameworks for news clustering
- Overall GPA: 18.23/20 (3.79/4)

Research Interests

☑ **Reinforcement Learning**	Social Reinforcement Learning
☑ **Deep Learning**	Theory of Deep Learning
☑ **Explainable AI**	Adverserial Attacks
☑ **Computational Neuroscience**	System Neuroscience

Research Experience

Research Assistant — *Tehran, Iran*

Cognitive Systems Lab, University of Tehran — *2021 - present*

- Working on Social Reinforcement Learning

Teaching Experience

Regular Teaching Assistant — *Neuromatch Academy*

United States — *2022*

- Computational Neuroscience and Deep Learning

Mentor — *HooshBaaz Summer School*

University of Tehran, Tehran, Iran — *2022*

- Data Analytics and Machine Learning

Teaching Assistant — *Dr. Mohammad Amin Sadeghi*

School of Electrical and Computer Engineering, Collage of Engineering, University of Tehran, Tehran, Iran — *2022*

- Advanced Deep Learning

Teaching Assistant — *Dr. Majid Nili Ahmadabadi*

School of Electrical and Computer Engineering, Collage of Engineering, University of Tehran, Tehran, Iran — *2021*

- Interactive Learning

Teaching Assistant — *Dr. Mohammad Reza Abolghasemi*

School of Electrical and Computer Engineering, Collage of Engineering, University of Tehran, Tehran, Iran — *2021*

- Machine Learning

Honors & Awards

Domestic

2020 **3rd Rank**, Among Graduated Bachelor Students based on Overall GPA among 70 students — *Tabriz, Iran*

2020 **Top 0.1%**, National Iran-Wide University Entrance Exam for Master's Degree in Computer Engineering, Iran — *Iran*

Technical Skills

Theoretical Experience

-Expertise: Statistical Machine learning, Reinforcement Learning, Design of Algorithms, Data structures and Databases

Programming and scripting

-Experienced in: Python, SQL, HTML, CSS, JavaScript and LaTeX
- Having familiarity with Matlab, C, C++ and Java

Libraries

-Expertness: Pandas, Numpy, Scipy, Pytorch, keras, Scikit-learn, BeautifulSoup and NLTK
- Familiar With Opencv, Jquery and Pymongo

Frameworks

-Specialized in: Django and Scrapy

Libraries

-Experienced in: Microsoft office
- Familiar With Adobe Photoshop

Projects

Launching a real-time data pipeline on the Crypto and Stocks market *2022*
- Using the benefits of Docker to launch BigData Tools on a container to design a real-time data pipeline with visual dashboard.

Using Apache Spark for NLP, Social Networks Analysis and dimesionality reduction tasks *2022*
- creating N-grams for a text book, Graph mining, Dimensionality reduction and training an ANN with Spark-ML.

Implementing multiple Neural Dynamic models of single cell and population models *2022*
- Implementing several biological Neuron Models and Examining the effect of parameters on them.

Analyzing behavioral data of subjects collected by designing a Psychopy task *2022*
- Designing the task of paper entitled ”Spatial Heterogeneity in the Perception of Face and Form Attributes”, and analyzing the collected data.

Studying Continuous-Time Neural Signals for different data modalities *2022*
- Working with different modalities of Continuous-Time Neural data like EEG, LFP and fMRI

Evaluating Discrete-Time Neural Signals *2022*
- Applying several algorithms like spike sorting, Unit based decoding, and population-based decoding on single cell unit data.

Investigating the role of Imitation and Emulation in Decision Making *2022*
- Implement the models of a related paper to investigate the mechanism of using imitation or emulation during human decision making.

Utilizing federated learning methods (FedAVG, FedADMM) for image segmentation task *2021*
- Applying FedAvarage and FedADMM for a semantic segmentation task on Camvid Dataset and investigating the influence of parameters.

Training Distributed Deep Neural Networks for Fashion MNIST classification *2021*
- Implementing GoSGD algorithm for training Deep Neural Networks for classification task and looking for the effect of delay and noise on training.

Implementing Multi-Agent Reinforcement learning algorithms for grid Environment *2021*
- Design a grid environment and apply Distributed Reinforcement Learning to investigate the learning of agents in this environment.

Implementing Generative Cooperative Network *2021*
- Combining an image generator and a classifier network to generate human face images, hand-written digits and data augmentation.

Setting up a Machine translation system with transformers (English to Persian) *2021*
- Implementing a transformer model from scratch for translating sentences by Pytorch and getting a BLUE score of 14.63 after 8 hours of training.

Implementing an Image captioning Deep Network *2021*
- Use Pytorch to implement a deep neural network and RNN for the image captioning task on the flickr8k data set.

Performing Semantic segmentation on Camvid Dataset *2021*
- Executing semantic segmentation on Camvid data set by implementing SegNet base Network with PyTorch.

Training Deep Reinforcement Learning Agents for turning the forest fires off *2021*
- Simulating a forest environment and a multi-agent system of drones trying to turn off the fire with double deep Q-leaning algorithm.

Finding the best route in a network with multi armed bandit algorithms *2020*
- Using multi-armed bandit algorithms like UCB, Gradient methods, and epsilon greedy policy to find the best route for given network.

Detecting Parkinson disease using signals of speech data with ensemble learning *2020*

- Using an ensemble of KNN models for detecting people with Parkinson's disease and reaching an accuracy of 96% .

Languages

English *Fluent*
Persian *Native*
Turkish *Native*

Academic Courses

Principles of cognitive science, 19.49/20 *2022*
Massive Data Analysis and Systems, 20/20 *2022*
Data Analysis, 19.5/20 *2021*
Distributed Optimization and Learning (Special Topics in Control Eng), 19/20 *2021*
Biological Computing, 19.6/20 *2021*
Interactive Learning (Special Topics in Control Engineering 1), 18.5/20 *2020*
Machine Learning, 19.9/20 *2020*