

FARBOD SIAHKALI

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Education

Bachelor of Electrical Engineering

Control Engineering Branch at University of Tehran

Score: 18.36/20

Sep. 2019 – July 2023

Tehran, Iran

Diploma of Mathematics

Salam High School

Score: 19.32/20

Sep. 2016 – June 2019

Tehran, Iran

Research Interests

- Game Theory
- Reinforcement Learning
- Machine Learning
- Optimization
- Control Theory
- Federated Learning

Experience

Research Assistant

Intelligent Networks Lab

Oct. 2023 – Present

- Towards Effective Opinion Shaping: A Deep Reinforcement Learning Approach in Bot-User Interactions.

TIL: Telecommunications Innovation Lab

Oct. 2022 – July 2023

- Predicting Arterial Blood Pressure (ABP) using subject's PPG signal and 1D convolutional neural networks.

TaarLab: Human and Robot Interaction Laboratory

May 2021 – Oct. 2022

- Implementing deep convolutional neural networks for person-reID, attribute recognition, and attribute retrieval tasks.
- Implementing human detection and tracking models.

Teaching Assistant

Sep. 2020 – Present

- Neural Networks & Deep Learning (*Master's Course*) — Spring & Fall 2023.
- Operational Research — Fall 2023.
- Instrumentation — Fall 2022 & Spring 2023.
- Linear Control Systems — Fall 2022.
- Engineering Mathematics — Fall 2021.
- Electronics I — Fall 2021.
- Engineering Mathematics — Spring 2021.
- Introduction to Computing Systems and Programming — Fall 2020 & Fall 2021.
- Introduction to Electrical Engineering — Spring 2021.

Publications

Image-based and Partially Categorical Annotating Approach for Pedestrian Attribute Recognition July 2023

Pre-print available at SSRN

- This paper suggests an image-based partially categorical attribute dataset (CA-Duke) and also proposes a two-step learning method for evaluating the separability of data in the latent space via a new metric called the Separation Index.

SIVD: Dataset of Iranian Vehicles for Real-Time Multi-Camera Video Tracking and Recognition Dec. 2022

Published in International Conference on Signal Processing and Intelligent Systems (ICSPIS 2022)

- In this paper, we propose a new web-scraped Iranian vehicle dataset (SIVD) (which has 29 classes and more than 36,000 images) for simultaneous real-time vehicle tracking and recognition.

Honors & Awards

Best Undergraduate Project Award

July 2023

- Have been honored with the Best Undergraduate Project Award at the Project Day held in the ECE Faculty of the University of Tehran. My project focused on implementing a novel approach for Pedestrian Attribute Recognition.

Notable Course Projects

Neural Networks & Deep Learning (*Master's Course*) | *PyTorch, TensorFlow* Fall 2022

- Exploring the performance of classical neural network architectures, including Adaline, Madaline, RBM, and MLP.
- Focusing on transfer learning in CNNs and implementing segmentation using YOLOv5.
- Diving into the world of RNNs and LSTM architectures, and then combining them with CNNs.
- Focusing on implementing the BERT model for NLP tasks and BEIT for image segmentation and classification.
- Exploring various GAN architectures, including Deep CGAN, ACGAN, and Wasserstein GAN.

Game Theory (*Master's Course*) | *Python* Spring 2023

- Gained a deep understanding of principles, including Nash Equilibrium, Mixed Strategy, Bayesian Games, and Auctions.
- Implemented a paper, constructing a non-zero-sum game framework for multi-vehicle driving, utilizing ADP-based reinforcement learning to achieve interactive decision-making, and validating the model at non-signalized intersections.

Artificial Intelligence | *Python* Spring 2023

- Utilized search algorithms like BFS, DFS, and A* in order to find the shortest path.
- Developed genetic algorithms for stock market optimization and Minimax algorithm for Othello.
- Applied Naive Bayes algorithms for image classification of Iranian digits.
- Utilized linear regression, decision trees, and ensemble learning techniques for housing price prediction.

Notable Research Projects

Iranian Vehicle Tracking and Recognition | *PyTorch, Selenium* Sep. 2022

- Proposed SIVD: Scraped Iranian vehicle dataset. Implemented a tracking and recognition using Yolov5 and OSNet.

Pedestrian Re-identification and Attribute Recognition/Retrieval | *PyTorch* July 2022

- Proposed Categorical Attribute DukeMTMC (CA-Duke) with 76 attributes for over 32,000 train and test images.
- Developed a multi-branched model for attribute recognition task without affecting the weights of the Re-ID baseline.

Fashion Recommendation System | *PyTorch, Flask* April 2022

- Web scraping online fashion stores and developing a recommendation system using feature re-ranking methods.

Relevant Coursework

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|-----------------------------------------------------------------|---------------------------------------------------------|------------------------|
| • Game Theory (<i>Master's Course</i>) | • Artificial Intelligence | • Modern Control |
| • Neural Networks & Deep Learning
(<i>Master's Course</i>) | • Robotics & Mechatronics
(<i>Master's Course</i>) | • Linear Algebra |
| | | • Operational Research |

Certificates

IELTS Certificate

- Listening: 8
- Reading: 8.5
- Writing: 7
- Speaking: 7
- Overall Score: 7.5

Coursera Courses

- Game Theory
- Getting Started with Git and GitHub
- Introduction to Web Development (HTML, CSS, Js)
- Introduction to Cloud Computing

Technical Skills

Coding Languages: Python, C, C++, HTML/CSS, Matlab, Verilog, SQL
Frameworks: PyTorch, TensorFlow, Keras, GitHub, Numpy, Pandas, Flask
Software Tools: VS Code, L^AT_EX, Git, Tensorboard, IBM Cloud Platform

References

Available upon request.