

EDUCATION

B.Sc. in Electrical Engineering, Electronics and Communications2019- 2023

Shahid Beheshti University (SBU) (Top 5 Electrical-Eng Universities in Iran, Full Undergraduate Scholarship)CGPA: 15.8/20 (3.4/4.0)

Thesis: Landmark Tracking and Object Detection, Complete Vision System for Self-Driving CarsGrade: 20/20 (Full mark)

Relative Coursework: VHDL (3.9), Embedded Systems (4.0), FPGA (3.83), Intro to AI (3.93), Digital Communications (3.6), Digital Electronics (3.6), Industrial Control (3.44), Microprocessor and Computer Structure (3.91), Numerical Computations (3.6), Computer Programming (3.93)

Research Interests: ML/DL, Security

EXPERIENCE

Research Assistant2020- 2023

SBU Robotics and Intelligent Automation Lab - LinkedInunder supervision of Dr. Mohammad Hossein Moaiyeri

Worked mainly on **autonomous vehicles** research: image processing, object detection, feature extraction, implementing DL models, and python software (detailed at Projects)

Research Assistant2022

Cyberspace Research Institute, Shahid Beheshti Universityunder supervision of Dr. Vahideh Moghtadaiee

Differentially private GANs, feature selection, data engineering, deep learning models

Lead Teaching Assistant for "Machine Learning"Fall 2023, Spring 2024

Shahid Beheshti Universityinstructed by Dr. Reza Ghaderi

Lead Teaching Assistant for "Introduction to Artificial Intelligence"Spring 2023

Shahid Beheshti Universityinstructed by Dr. Atefe Aghaei

Lead Teaching Assistant for "Computer Programming (Python)"Spring 2021, Fall 2022

Shahid Beheshti Universityinstructed by Dr. Vahideh Moghtadaiee

Created class content, held sessions, graded projects and exams for overall more than 300 students

Teacher of "Python Programming" CourseFall 2023

Danesh High School, Tehran, Iran

Lecturer for "Machine Learning" CourseAug 2023

RoboCamp, Tehran, Iran

Prepared extensive material including theoretical concepts and various code snippets for simulations and real-world ML projects

Technical Committee of Junior Soccer Open League (Certificate)May 2023

IranOpen Robocup

Executive Member of "Electrical Engineering" and "Robotics" Scientific Associations2020- 2022

Shahid Beheshti University

PUBLICATIONS

(DETAILS/PDF AVAILABLE ON PERSONAL WEBSITE), , GOOGLE SCHOLAR

[In Preparation] M.H. Moaiyeri, S.P. Hemmasi, **Milad Rabiei** |
Unified Driver’s Behavior Recogniser System Aiming to Provide Safety with Connected Cars [Since 2023]

[Submitted to Elsevier-Information Sciences journal] Mina Alishahi, Vahideh Moghtadaiee, Amir Fathalizadeh, **Milad Rabiei** |
Mutual Impact of Feature Selection and Hiding Sensitive Information Mechanisms [2024]

[Manuscript] F. Younesi, S. Keivanfard*, **Milad Rabiei***, M. Sharifi*, M. Ghayour Najafabadi, B. Moadeli, A. Jafari, M.H. Moaiyeri |
An Optimized Platform for Cost-Efficient Density-based Tracking Systems (* equal contributions) [Since 2022]

[Submitted to Springer-International Journal of Information Security] V. Moghtadaiee, M. Alishahi, **Milad Rabiei** |
Differentially Private GANs for Generating Synthetic Indoor Location Data [2023]

EXTRA ACTIVITIES

Organization and Management of a Deep Learning Reading Group at the ECE Department

Fall 2023 at SBU

Conference Coordinator:

- Management of the 4th Iranian International Conference on Microelectronics (IICM 2022)

20-22 Dec 2022 at SBU

- Management of the 13th Power Electronics and Drives: Systems and Technologies Conference (PEDSTC 2022)

01-03 Feb 2022 at SBU

SKILLS

Programming	Python (OpenCV, PyTorch, Keras, Numpy, Pandas, Matplotlib, Scikit-Learn, Selenium), C, MATLAB, Lua
Embedded	Raspberry Pi, Nvidia Jetson Nano and Orin NX, Arduino family, NodeMCU ESP8266, ESP32
Languages	Persian (Native) English (Proficient) IELTS (Feb 4th, 2023) Test Result: 7.5 - L(8.5), R(8), W(7), S(7)

PROJECTS

Analysis of Private Data Generation

Cyberspace Research Institute

[Source Code](#)

- a comprehensive study comparing how **anonymization, Differential Privacy (DP), Generative Adversarial Networks (GAN), and Differentially Private GAN (DPGAN)** techniques affect **feature significance** in privatized datasets, addressing the challenge of information hiding. It investigates how several criteria including dataset properties, privatization techniques, feature selection methods, and privacy levels influence utility loss and privacy gain. The study explores **trade-offs between privacy and data utility** using various metrics. (Submitted Paper)

- The project presents an approach for **privacy-preserving generation of synthetic indoor location data** by using Differentially Private Generative Adversarial Networks (DPGANs) and its variants, more specifically **DPWGAN and DPCGAN**. The approach is experimentally evaluated with regards to various ML and privacy related metrics. (Submitted Paper)

1:10 Scale Self-Driving Robot Car

SBU Robotics Lab

- Setting up an **Nvidia Jetson board** operating a Linux Ubuntu, and a wide lens camera sensor to tackle tasks of **vision and intelligence**.

- Leading the evolution of **lane detection** methodologies from **filter-based techniques** with **novel density-based trackers to deep learning models**, Achieving robust path planning in collaboration with the Control section.

- Leading the **training, testing, and deployment of multiple object detection models**, including **Scaled-YOLOv4, YOLOv5, and YOLOv8** enabling the robot to accurately identify and respond to traffic signs, signals, and obstacles.

- Development of a **synthetic data generation and augmentation pipeline** which helped improve the robustness of the model significantly.

Face and Hand Gesture Detection

[Source Code](#)

With a focus on detecting **sign language**, this computer vision project uses pretrained optimized neural networks from **Google's Mediapipe** to get hand landmarks which are then passed into a **NN model** for **gesture recognition** (Acc 96%). The result is then sent to an ESP32 board.

Implementation of GAN and CGAN for MNIST dataset

Generating **synthetic samples** for MNIST image dataset with the help of generative adversarial networks. **Conditional generation** was also examined based on CGAN architecture. This project was programmed in Python with PyTorch neural network package.

Ball Balancer

A motor tries to balance a ball on a rod (plate). By implementing **PID controllers** and using **ToF Laser-ranging sensors**, the device can hold the ball stable on any distances on the rod, specified by user. It uses **ESP8266** as controller device and server for **web connection**.

Genetic Algorithm on Images

[Source Code](#)

A slightly altered Genetic Algorithm is implemented to generate the famous Alan Turing image from random pixels. The project includes **selection, simultaneous crossover**, and slightly-enhanced **adaptive mutation**, to get results.

Image Classification using Canny Features

[Source Code](#)

Several models are utilized to classify a web scraped dataset of images (only Canny features to reduce computation and training time).

HONOURS AND AWARDS

1st place, Individual Team Section, Autonomous Vehicles League

[IranOpen RoboCup 2022](#)

1st place, Technical Challenge, Autonomous Vehicles League

[IranOpen RoboCup 2022](#)

2nd place, Race Section, Autonomous Cars League Simulation

[Fira RoboWorld Cup SDE 2021](#)

1st place, Race Section, Autonomous Cars League Simulation

[Iran Fira RoboWorld Cup 2021](#)

2nd place, Urban Section, Autonomous Cars League Simulation

[Iran Fira RoboWorld Cup 2021](#)

REFERENCES

Dr. Mohammad Hossein Moaiyeri

Associate Professor, Shahid Beheshti University, Iran, [Mail](#), [Scholar](#)

Dr. Reza Ghaderi

Associate Professor, Shahid Beheshti University, Iran, [Mail](#), [Scholar](#)

Dr. Mina Alishahi

Assistant Professor, Open Universit t, The Netherlands, [Mail](#), [Scholar](#)

Dr. Vahideh Moghtadaiee

Assistant Professor, Shahid Beheshti University, Iran, [Mail](#), [Scholar](#)