Mohammad Mahdi Khademi

Tehran, Iran | E-mail | Phone Number | LinkedIn | GitHub | My Website

Research interests

- Autonomous Vehicles
- Reinforcement Learning
- Robotics
- Deep Learning
- Mechatronics and Mechanical design

Education

B.Sc **Iran University of Science and Technology (IUST)**, Bachelor of Mechanical Engineering — Sep 2021 – present

- **Total GPA:** (3.08/4)
- **Last 2 Years GPA:** (3.39/4)

Research experience

Mechatronics Lab, **Reinforcement Learning for Autonomous Parallel Parking** — March 2024 - present

- Worked on training a virtual car to perform parallel parking using reinforcement learning algorithms such as SAC, DQN, and TD3 for continuous control tasks. I developed a custom reward function to effectively optimize the car's alignment, curb distance, and overall success in completing parking maneuvers. To test and refine these strategies, I ran simulations in Webots, with future plans to integrate real-world sensors and enhance control mechanisms for practical implementation.

  Superviser: Dr. Seyed Hassan Zabihifar, Assistant Prof.

Projects

Automated License Plate and Lane Detection Using Deep Learning and Image Processing — Nov 2023

Related Course: Artificial Intelligence

- Developed a CNN-based system for automated license plate recognition and character reading. Applied image processing techniques for lane detection and integrated real-time video input for dynamic analysis. Designed a user-friendly interface for seamless image and video processing.

Human Detection and Pose Estimation with Deep Learning — Sep 2023

Related Course: Artificial Intelligence

- Collected and annotated a human pose dataset, trained a CNN using TensorFlow and Keras for pose classification, and integrated YOLO for real-time human detection. Developed a keypoint-based system for pose estimation and visualized detected poses, enhancing computer vision and machine learning skills.

Modeling and Simulation of an R-3000 Rotopod in SOLIDWORKS and MATLAB — May 2024

Related Course: Mechanisms Design

- Designed and simulated a Rotopod using the Stewart platform to achieve six degrees of freedom, minimizing vibrations and instability. Simulated in CoppeliaSim and modeled in SolidWorks, with kinematic analysis conducted in MATLAB to ensure optimal performance. Focused on optimizing material usage and functional efficiency, producing visual outputs to illustrate the mechanism's transportation potential.

Selected Courses

Artificial Intelligence, GPA :20/20 (4/4)

Computer Programming, GPA : 19.6/20 (4/4)

Mechanism Design, GPA :19.4/20 (4/4)

Teaching experience

Artificial Intelligence, Teaching Assistant — Fall 2024
The school of Mechanical Engineering, Iran University of Science and Technology — Fall 2025
Supervisor: Dr. Seyed Hassan Zabihifar, Assistant Prof.

Advanced Control Systems, Teaching Assistant — Fall 2024
The school of Mechanical Engineering, Iran University of Science and Technology
Supervisor: Dr. Amir Hossein Davaie Markazi, Prof.

Engineering Dynamics, Teaching Assistant — Fall 2024
The school of Mechanical Engineering, Iran University of Science and Technology
Supervisor: Dr. Majid Rajabi, Associate Prof.

Mentor of an Artificial Intelligence Competition, overseeing and providing guidance to participants. — Fall 2024

Mechanism Design, Teaching Assistant — Winter 2025
The school of Mechanical Engineering, Iran University of Science and Technology — Spring 2025
Supervisor: Dr. Seyed Hassan Zabihifar, Assistant Prof. — Summer 2025

Honors and Awards

Ranked among top 0.01% in the nationwide university undergraduate entrance exam **Iran**. — Sep 2021

Technical skills

Engineering Softwares: SOLIDWORKS, MSC ADAMS, Webots, CoppeliaSim, Gazebo, Arduino, Simulink, Abaqus CAE

Programming Languages: Python, MATLAB, C++

Machine Learning Frameworks: TensorFlow, Keras, PyTorch

Python Libraries: NumPy, Matplotlib, Pandas, SciPy, OpenCV

Publishing Tools: LaTeX, Microsoft Office Package

Operating Systems: Windows, Linux, ROS

Languages

Persian: Native
English: Fluent
TOEFL iBT: It will be ready on **October 2, 2025**.
Reading: **-/30** Listening: **-/30** Speaking: **-/30** Writing: **-/30**

References

Dr. Seyed Hassan Zabibifar
Assistant Professor
Home Page: Dr. Seyed Hassan Zabibifar

Dr. Majid Rajabi
Associate Professor
Home Page: Dr. Majid Rajabi

Dr. Amir Hossein Davaie Markazi
Professor
PhD: Mechanical Engineering Dept., McGill University, Montreal, Canada, 1995
Home Page: Dr. Amir Hossein Davaie Markazi