Mohammad Mahdi Khademi

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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

Robotic & Artificial intelligence Lab (RAIZ), **Reinforcement Learning for Autonomous Parallel Parking** — March 2024 - present

- Trained a virtual car to perform parallel parking using reinforcement learning (PPO, DQN, TD3). Created a custom reward function to optimize alignment, curb distance, and maneuver success. Tested in Webots with plans for real-world sensor integration and enhanced control.

Superviser: Dr. Seyed Hassan Zabihifar, Assistant Prof.

Honors and Awards

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

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

Projects

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

Related Course: Mechanisms Design

- Designed and simulated a Rotopod using a Stewart platform for six degrees of freedom, reducing vibrations and instability. Modeled in SolidWorks, simulated in CoppeliaSim, and analyzed in MATLAB.

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 with TensorFlow/Keras for classification, and integrated YOLO for real-time detection. Built a keypoint-based pose estimation system with visualization, strengthening computer vision and ML expertise.

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.

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

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.

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

Languages

Persian: Native
English: Fluent
TOEFL iBT: It will be ready on **November 4, 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
Home Page: Dr. Amir Hossein Davaie Markazi