# 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