

# Mohammad Mahdi Khademi

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## Research interests

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

## Education

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**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

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**Mechatronics Lab, 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.

Supervisor: [Dr. Seyed Hassan Zabihiifar](#), Assistant Prof. [🔗](#)

## Honors and Awards

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**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

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**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

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**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

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**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

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**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

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**Persian:** Native

**English:** Fluent

**TOEFL iBT:** It will be ready on **November 4, 2025**.

Reading: -/30

Listening: -/30

Speaking: -/30

Writing: -/30

## References

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**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](#)