Negar Naghavian

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Research interests

- Reinforcement Learning
- Robotics
- Mechatronics and Mechanical Design
- Automatic Control Systems
- Deep Learning

Education

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

- **Last year GPA:** 3.71/4
- **Total GPA:** 3.14/4

Research experience

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

- Training a virtual car for parallel parking using reinforcement learning algorithms (PPO, DQN and TD3) for continuous control. Designing a reward function to optimize alignment, curb distance, and successful parking maneuvers. Simulating scenarios in Webots while planning for real-world sensor integration and control refinement.

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

- Created a comprehensive 3D model of the R-3000 Rotopod in SOLIDWORKS, accurately representing its mechanical structure and movements. Simulated dynamic performance in MATLAB to analyze key operational parameters and behavior.

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

Related Course: Artificial Intelligence

- Developing a license plate detection system using CNNs and character recognition for automated reading. Applying image processing for lane line detection and integrating real-time video input for dynamic environments. Designing a user-friendly interface for image and video processing.

Human Detection and Pose Estimation with Deep Learning — Sep 2023

Related Course: Artificial Intelligence

- Implemented human detection using YOLO for fast and accurate identification.
- Developed a CNN model for classifying human poses, such as walking or sitting, and combined both for a system that recognizes and categorizes human activities.

Selected Courses

Artificial Intelligence, GPA :19.9/20 (4/4)

Automatic Control Systems, GPA : 18.1/20 (4/4)

Fundamental of Programming , GPA :19.1/20 (4/4)

Teaching experience

Automatic Control Systems, Teaching Assistant — Winter 2025
The school of Mechanical Engineering, Iran University of Science and Technology,
Instructor: Dr. Amir Hossein Davaie Markazi, Prof.

Mechanical Vibrations , Teaching Assistant — Winter 2025
The school of Mechanical Engineering, Iran University of Science and Technology,
Instructor: Dr. Majid Rajabi, Associate Prof.

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

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

Technical skills

Programming Languages: Python, MATLAB, C++

Machine Learning Frameworks: TensorFlow, Keras, PyTorch

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

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

Languages

English: Fluent. TOEFL iBT: 103

Reading: 27/30 Listening: 29/30 Speaking: 21/30 Writing: 26/30

Persian: Native

References

- **Dr. Seyed Hassan Zabibifar**
  Email: shzabihifar@iust.ac.ir
  Home Page: Dr. Seyed Hassan Zabihifar

Dr. Majid Rajabi
Email: majid_rajabi@iust.ac.ir
Home Page: Dr. Majid Rajabi

- **Dr. Amir Hossein Davaie Markazi**
  Email: markazi@iust.ac.ir
  Home Page: Dr. Amir Hossein Davaie Markazi