

# Ali Karimzade

Robotics Engineer

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## SUMMARY OF QUALIFICATIONS

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- First-year MEng in mechanical engineering student at the University of Ottawa.
- Excellent individual and teamwork skills honed through years of experience in various projects.
- Research and analysis skills developed by working on my Bachelor of Science thesis for two years.
- The broad scope of robotics expertise allows for a rapid and complete comprehension of projects.

## EDUCATION

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### ● Master of Engineering, Mechanical Engineering(Robotics)

University of Ottawa, ON

SEP 2022 - Until now

- **Relevant Courses:** Biomechanics of Movements, Digital Signal Processing, Applied Artificial Intelligence

### ● Bachelor of Science, Mechanical Engineering(Robotics)

University of Isfahan, Isfahan

SEP 2016 - OCT 2020

- **Bachelor's Theses:** [Using Deep Reinforcement Learning algorithms to push an object with robotic Manipulators](#)  
**Supervisor: Dr. Karimpour** **Grade:20/20**
- **Overall GPA:** 3.46
- **Relevant Courses:** Computer Programming, Dynamics, Dynamics of Mechanics, Mechanical Vibration, Automatic Control, Robotics, Artificial Intelligence and Expert Systems, Simulation of Dynamic Systems, and Control
- **Relevant Courses from MSc Programs(voluntary Participation):** Digital Image Processing, Robotics

## SKILLS

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### ● Engineering Skills

- **Robotics:** Robot Operating System(ROS), Gazebo, MoveIt, MuJoCo, OpenSim, LabVIEW
- **Machine Learning:** TensorFlow, PyTorch, scikit-learn
- **Computer Vision:** OpenCV, Matlab Image Processing Toolbox
- **Digital Signal Processing:** MATLAB DSP System Toolbox, FIR and IIR filters, FMCW Radars
- **Linear control system design:** Lead-Lag and PID Controllers
- **Embedded Systems:** Raspberry Pi, NVIDIA Jetson TX1, Arduino
- **Web, and Android development:** Tailwind CSS, React, Django, SQL, Android Studio
- **Operating Systems:** Ubuntu, Windows, Debian

### ● Languages

- **Programming:** Python, JavaScript, C++, Java
- **Markup:** L<sup>A</sup>T<sub>E</sub>X, HTML, CSS, XML, YAML, SQL

### ● Soft Skills

- **Quick Learner:** Constantly keen to learn new things, especially in my area of interest.
- **Passionate to work in teams:** With numerous projects completed in teams and experience with Git and Docker to speed up and organize DevOps in groups, teamwork skills have advanced.

## RESEARCH INTERESTS

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- Machine Learning
- Computer vision
- Robotics and Simulation
- Digital Signal Processing
- Control System Design
- Biomechanics
- Autonomous vehicles
- Embedded systems programming

## RELEVANT WORK EXPERIENCE

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### ●Robotics Researcher

Research Team Member — University Of Isfahan, Isfahan

JAN 2019 - JAN 2021

- Reconstruction of a homemade 3 DOF robot and servo motor drivers connection to Advantech PCI cards.
- Operation of the robot with ROS and its simulation in the Gazebo software.
- Development of a controller and motion planner for it in the ROS environment.

### ●Computer Vision Engineer

Internship — Novinilya Company, Isfahan

JUN 2019 - AUG 2019

- Examination of the surface quality of the parts on the mass production at the plants.
- Object recognition with embedded boards like Jetson TX1 and industrial Basler cameras in the company's R&D team.

## ACADEMIC PROJECTS

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### ●Artificial Intelligence

- [Twin Delayed DDPG \(TD3\) algorithm implementation for the Ant robot in MuJoCo \(in Gym library\) to run forward.](#)
- Evolutionary algorithms Implementation, including the Differential Evolution Algorithm (DE) and the [Multi-Verse Optimizer \(MVO\)](#).
- [Implementation of DDPG and TD3 algorithms in my B.Sc. thesis to push objects to their desired goal in a simulated environment with the help of hindsight experience replay paper.](#)
- Implementation of deep Q-Networks in a four-player fruit-eating game for an AI competition.
- Using K-means and KNN in Scikit-Learn for the Classification of cities' weather as dry or humid using unlabeled data

### ●Image Processing and Computer Vision

- [Implementation of the AlexNet architecture for image classification on the MNIST and CIFAR-10 datasets.](#)
- Designing filters in the frequency and spatial domain in both OpenCV and MATLAB.
- Android software development to recognize chosen cap colors and program an Arduino board to sort plastic bottle caps.

### ●Robotics

- Building a line-following robot with an Android phone and an Arduino to find road directions by image processing.
- Worked with KUKA LBR iiwa at Isfahan University of Technology (IUT)

### ●Digital Signal Processing

- [FMCW radar simulation for autonomous vehicles to detect objects' movement within 300 meters.](#)

### ●Systems and Controls

- Designing a PID controller for a simulated 3-DOF robot in ROS (used in the B.Sc. thesis).
- Using LabVIEW for the implementation of keyboard-based control with PID control.
- Controlling servomotors in torque mode using MATLAB for system identification and the design of a PID and lead-lag controller.

## LANGUAGES

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### ●English

- IELTS Academic: 6.5 Overall

DEC 2021

## REFERENCE

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### ●Dr. Karimpour

- Assistant Professor, Department of Mechanical Engineering at the University Of Isfahan

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### ●Dr. Karshenas

- Assistant Professor, Artificial Intelligence Department at the University Of Isfahan

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### ●Dr. Kazemi

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