Ali Karimzadeh Esfahani

Robotics Engineer

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SUMMARY OF QUALIFICATIONS

- First year MEng in mechanical engineering student at the university of Ottawa.
- Excellent individual and teamwork skills honed through years of experience in University projects.
- Research and analysis skills developed by working on my Bachelor of Science thesis.

EDUCATION

• Master of Engineering, Mechanical Engineering(Robotics)

University of Ottawa, ON — SEP 2022 - Until now

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

• Bachelor of Science, Mechanical Engineering(Robotics)

University of Isfahan, Isfahan, Iran — SEP 2016 - OCT 2020

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

SKILLS

• Engineering Skills

- **Robotics & Reinforcement Learning:** 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 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:** HTML, CSS, Tailwind CSS, React, Django, SQL, Android Studio
- **Operating Systems:** Ubuntu, Windows, Debian

• Languages

- **Programming:** Python, JavaScript, C++, Java
- **Markup:** LaTeX, HTML, CSS, XML, SQL

• Soft Skills

- **Quick Learner:** I am always eager to learn new things, especially in my research area of interest.
- **Passionate to work in teams:** With many projects that I have done in teams, I have experience with teamwork, and I am also good at working with Git and GitHub to ease teamworking.

RESEARCH INTERESTS

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

RELEVANT WORK EXPERIENCE

• Robotics Researcher

Research Team Member — University Of Isfahan, Isfahan, Iran **JAN 2019 - JAN 2021**

- Setting up its servo motor driver to work with Advantech PCI cards.
- Setting it up to work with ROS.
- Stimulating robot in Gazebo software.
- Designing a controller and motion planning for it in ROS environments.

• Computer Vision Engineer

Internship — Novinilya Company, Isfahan, Iran **JUN 2019 - AUG 2019**

- I worked with Novinilya company to survey the surface quality of components in the factories' production line.
- I worked with the R&D team of the company to use embedded boards (Jetson TX1) and also worked with industrial cameras(Basler cameras) for classifying objects by CNN.

ACADEMIC PROJECTS

• Artificial Intelligence

- Implementation of Twin Delayed DDPG (TD3) algorithm for Ant robot in MuJoCo from Gym library to go forward.
- Implementation of evolutionary algorithms like Differential Evolution Algorithm (DE) and 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
- Al challenge: designing a Fruit Eater player to win a costume board game among three other players (I used Deep Q-Networks)
- Classification of cities' weather to dry or humid using unlabeled cities sensors data and Verify it with labeled data (using K-means and KNN by scikit-learn)

• Image Processing and Computer Vision

- Implementing AlexNet to classify MNIST and CIFAR10 datasets with high accuracy
- Projects in DIP class: Designing filters in the frequency domain and spatial domain (in OpenCV & MATLAB)
- Sorting plastic bottle caps by color: I worked in a group of four engineers, and my duty was to design an Android Program for detecting selected colors of caps and sending commands to the Arduino board to sort them.

• Robotics

- Building a handmade robot (at the University of Isfahan).
- Line Follower Robot: using image processing to find Road Direction (by android phone) and Arduino.
- experience working with KUKA LBR iiwa (at the Isfahan University of Technology(IUT)).

• Digital Signal Processing

- Simulation of an FMCW Radar to detect moving objects' motion in the 300-meter range suitable for Autonomous vehicles.

• Systems and Controls

- Controlling Single Servo Motor in torque mode: using MATLAB for system identification and design PID & Lead-Lag controller.
- using LabVIEW for implementing Keyboard Based Control with PID control.
- Designing controller for simulated 3-DOF Robot in ROS (used in bachelor's thesis).

HONORS & AWARDS

- Among Exceptional Talents at the University of Isfahan (2020).
- Accepted in the provincial Chemistry Olympiad (2015).
- I was among the top twenty percent of students in the Mechanical Engineering Department (2020).
- Achieve ranking of 5308 among 162879 participants in the University Entrance Examination for bachelor's degree (2016).
- Participate in Physics and Chemistry High School Lab competitions (2015).

WORKSHOPSWORKSHOPS & SEMINARS

- Completing "Mathematics for Machine Learning: Linear Algebra" course in Coursera.
- Completing "Robotics: Vision Intelligence and Machine Learning" course in edX(free).
- Workshop to make airplane models (Aero-Star & Kadet) in a group (in 2020).
- Participation in the "Design for Manufacture and Assembly (DFMA)" seminar (in 2019).
- Participation in the workshop "making composite materials by hand lay-up method" (in 2018).
- Participation in Glider-making competitions at Sharif University of Technology(SUT) in a group of three students (in 2018).

LANGUAGES

- **Persian**
  - Native Speaker
- **English**
  - **IELTS Academic:** **DEC 2021**
  - Overall: 6.5
  - Listening: 7.5
  - Reading: 7
  - Writing: 6
  - Speaking: 5.5

REFERENCE

- **Dr. Hossein karimpour**
  - **Assistant Professor, Department of Mechanical Engineering, University Of Isfahan**
  - **Tel:** +983137935603
- **Dr. Hossein Karshenas**
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