Ali Karimzade

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 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

• 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 — 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
- **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:** 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
- **Operating Systems:** Ubuntu, Windows, Debian
- **Familiarity with Web, and Android development:** Tailwind CSS, React, Django, SQL, Android Studio

• Languages

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

• Soft Skills

- **Quick Learner:** Constantly keen to learn new skills, 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

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

RELEVANT WORK EXPERIENCE

• 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

• 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 Al 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.
- Controlling the KUKA LBR iiwa through several point-to-point pathways 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

• English

- **IELTS Academic:** 6.5 Overall **DEC 2021**

REFERENCE

• Dr. Karimpour

- Assistant Professor, Department of Mechanical Engineering at the University Of Isfahan
- **Tel:** +98(313)793-5603

• Dr. Karshenas

- Assistant Professor, Artificial Intelligence Department at the University Of Isfahan
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• Dr. Kazemi

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