Ali Karimzade
Robotics Engineer

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⦿ **Commanda Way, Ottawa K1M 1E7**

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.

○ Excellent range of expertise in robotics to completely comprehend the enormous robotic projects and prepare for them within the minimum timeframe.

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

○ **Web, and Android development:** Tailwind CSS, React, Django, SQL, Android Studio

○ **Operating Systems:** Ubuntu, Windows, Debian

● **Languages**

○ **Programming:** Python, JavaScript, C++, Java

○ **Markup:** LaTeX, 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

- 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 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

- **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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