

# Ismail Abou Zeid

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Beirut, Lebanon

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## EDUCATION

**Rafik Hariri University**, Mechref, Lebanon

September 2020 – August 2024

**ABET Accredited Bachelor of Engineering in Mechatronics Engineering (93.08/100)** – minor in **Computer Science**

**Beirut Annunciation Orthodox College**, Beirut, Lebanon

September 2005 – June 2020

**Lebanese Baccalaureate in General Sciences**

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## EXPERIENCE

**Oreyeon**, Beirut, Lebanon

June 2023 - Present

**Computer Vision Intern**

- Conducted in-depth research to compare and benchmark different image stitching techniques, including classical approaches and Deep Learning (DL) methods.
- Developed a C++ class library for an image stitching pipeline, utilizing Object-Oriented Programming (OOP)
- Optimized the image stitching process for the NVIDIA AGX Orin, achieving an 83% improvement in processing speed through the implementation of multithreading techniques.
- I improved code maintainability with Doxygen documentation, followed C++ core guidelines for quality, and wrote Boost unit tests for thorough development.

**Freelancer**

January 2023 – June 2023

**Course Content Writer**

- I wrote chapters for a high school AI course covering the following topics: scikit-learn, pandas, different ML models, Scratch AI.
- Prepared final projects for 2 levels: Mobile Phone Price Classification and Bitcoin Closing Price Prediction.

**ISS Software Hive**, Beirut, Lebanon

August 2022 – September 2022

**Internship Trainee**

- Built Machine Learning models using PyTorch to practice: Neural Networks, CNNs, RNNs, GANs.
- Implemented Reinforcement Learning Algorithms (Q-Learning, DQN, and PPO) using PyTorch in different OpenAI gym environments using Jupyter Notebook.
- Utilized the ML-Agents Package and the Python API to train agents using built-in and custom implementations of RL Algorithms specifically PPO, Q-Learning and DQN.

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## Projects

- **2D Physics Engine**

Currently developing a C++ physics engine with SFML for rendering, featuring a polymorphic class structure and basic collision handling for entities.

- **Capstone Project: General Pick and Place Mobile Robot**

Currently developing a robot capable of navigating spaces and performing pick and place tasks. I'm leading the software aspect of this robot in regard to ROS and computer vision.

- **Recipe App**

Collaborated with a group of 3 to develop an android application that allows users to look up and bookmark recipes. This project done using the Spoonacular API and SQLite.

- **Hand Gesture Controlled Mobile Robot**

Used ROS, OpenCV, and the MediaPipe library to detect position of several hand landmarks. Utilized these landmarks to create gestures that offer linear and angular control over the robot's speed.

- **Self-Driving Car Navigation using Reinforcement Learning Techniques**

Taught a car agent to navigate to a target without hitting any obstacles in a simulated Unity environment based on observations from a ray cast sensor using the PPO algorithm and the ML-Agents package.

- **Black-Scholes Monte Carlo Option Pricing**

This project implements a Monte Carlo simulation for option pricing based on the Black-Scholes model. The simulation estimates the prices of European call and put options.

- **SLAM Mobile Robot Using ROS**

A two-wheeled robot simulated in Gazebo mapped its environment using Gmapping then localized itself via AMCL and planned paths to objectives using the move\_base package

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## SKILLS

- **Software:** C++, Python, Linux, Git, GitHub, PyTorch, Unity, MATLAB, AutoCAD, SolidWorks, Fusion360, Robot Operating System, Arduino, Doxygen, OpenCV, CUDA.
- **Languages:** Fluent in English and Arabic, limited proficiency in German.