

# Usama Hamayun Ghouri

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## Skills

<b>Robotics</b>	Ros, ROS2, SolidWorks, DJI SDK, Docker Desktop, Behavior Trees, Path Planning, SLAM, Visual Navigation.	<b>Testing</b>	Pytest, Docker, Gtest.
<b>Languages</b>	Python, C++ , Bash, XML	<b>Electronics</b>	PCB Design, Schematic Diagrams, Intel Altium, Proteus, Eagle Cad.
<b>OS</b>	Ubuntu, CentOS	<b>Others</b>	Matlab, Overleaf, Overleaf, Reinforcement Learning, Pytorch.

## Experience

### WeCrunch

Nov 2022 – Present

#### Robotics Engineer

- Design of Autonomous Indoor Drones and Mobile Robots.
- Implementing Path Planning and Navigation Algorithms
- Development of Test Benches
- Collaboration Between AI Team for development of AI based Detection Algorithms
- Development of Software Stack using ROS/ROS2, OMPL, Behavior Trees
- Contributed in Development of Isaac Sim Based Simulation for testing
- Developed Power Electronics for mobile robot
- Developed Tethering Power Solution for Drones, PCB Design and its Electronics.

### Accomac Technologies

March 2019 - Sep 2023

#### UAV Engineer

- Contributed in Development of Software stack of Fully Autonomous Agriculture Spraying Drone.
- Contributed in Sourcing and Procurement of Drone Hardware.
- Implemented Vision Based object detection
- Surveying and Mapping using multispectral Cameras

### Salman And Associates

Sep 2019 - Sep 2022

#### Technical Sales and Support Engineer

- Presented Companies as a Technical Rep of Various International Companies in pakistan.
- Providing Bespoke Solutions to industrial clients.
- Commissioning and Procurement of Machineries(CNC, Robotic ARMs)
- Providing full time after sales and service support.

## Education

### Universitat Politecnica De Catalunya (UPC - Barcelonatech

2022-2025

#### Masters OF Automatic Controls and Robotics

### Air University - Islamabad

2015-2019

#### Bachelors Of Mechatronics Engineering

## Publication

### Attitude Control of Quad-copter using Deterministic Policy Gradient Algorithms (DPGA)

- Deep Reinforcement Learning, ROS1, Gazebo, Pytorch.

## Projects

### Exploration Scheme of Multi-Robot System Using Centralized Predictive Controller - Master's Thesis

- Model Predictive Controls, Path Planning, Optimization, Visual Odometry, ROS2, Python

### Chess Playing Robot

- ROS2, Visual Mapping and localization, C++.

### Autonomous Robotic Stock Counting System

- SLAM, QR Detection, Automatic Power tethering system, DJI MSDK, IOT.

**Exploring Service Robotics: Task and Motion Planning for Classroom Automation with Tiago Robot**

– Path Planning, Kautham, ROS2, OMPL, Python.

**Hybrid Predictive Temperature Control System**

– Hybrid Model Predictive Control, Matlab, Simulink

**Exploring Service Robotics: Task and Motion Planning for Classroom Automation with Tiago Robot**

– Path Planning, Kautham, ROS2, OMPL, Python.

**Autonomous Delivery Drone - Bachelors Final Year Project**

– Pixhawk, Electronics, Outdoor Mission Planning.

## References

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**Usama Altaf - Senior AI Engineer**

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**WeCrunch**

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**Newyork Department of Education**