Dhruv Pandit

London | dupandit@gmail.com | +44 7355 640603 | Dhruv Pandit | thePanda-6400

Experience

Defence Research and Development Organisation, Research Intern — Jan 2023 - June 2023 6 Months

- Completed a robot locomotion project that included the use of LiDAR based SLAM for obstacle detection and avoidance
- **Relevant Skills:** ROS2, Gazebo, SLAM

ioGenies Solutions, Embedded Software Engineer, Intern — June 2022 - July 2022 2 Months

- Interface various sensor modules using I2C and UART
- Created a library that enables embedded devices to communicate with a Smart Meter using the MODBUS communication protocol
- **Relevant Skills:** Embedded C, Circuit Design

Education

MSc **King's College London**, Robotics — January 2025 (expected)

- **Final Project:** Reinforcement Learning to Optimise the Locomotion of Bipeds
- **Relevant Skills:** PyTorch, Gazebo, MPC, PD Control, Reinforcement Learning

B.Tech **MIT World Peace University**, Electrical Engineering — June 2023

- GPA: 8.4/10 (Distinction)
- **Capstone Project:** Machine Learning for Control
- **Relevant Skills:** Simscape, MATLAB, PID

Projects

Reinforcement Learning to Optimise the Locomotion of Bipeds

- Implemented a PD controller to achieve biped locomotion
- Designed a custom environment using Gazebo and OpenAI Gym to train the robot
- The feedback from the Robot's sensors was used as observations to train the A2C reinforcement learning algorithm to tune the gains of the PD controller such that power consumption reduced by 42%
- **Relevant Skills:** Reinforcement Learning, PyTorch, PD control, A2C, OpenAI Gym

Museum Guide Robot

- A TIAGo Robot programmed to act as a museum guide
- Implemented object detection and avoidance using both computer vision and LiDAR
- Implemented the YOLO V8 to detect and recognize various pieces of artwork
- Simulated the robot and the environment in Gazebo and programmed the robot using ROS
- **Relevant Skills:** ROS, CNN, PyTorch, OpenCV, SLAM, Object Detection

Autonomous Aquatic Glider

- Designed and Built an Autonomous Aquatic Glider for the environmental monitoring of lakes up to a depth of 100 metres
- Simulated the glider and the environmental forces acting on it in Simulink and used the simulation to design the PID controller to control the glider's pitch angle
- Implemented the PID control and on-off control to control the pitch angle and depth of the glider using an Arduino and BTS7960 motor controllers

- Interfaced an IMU, SONAR, and Temperature Sensor with the Arduino using I2C and UART
- **Relevant Skills:** MATLAB, Simulink, Embedded Programming, State-Space analysis, Electronic Design, Sensor Integration, Communication Protocols, Circuit Design, PID Programming, I2C, UART, SPI

Robot Locomotion Research

- Created the URDF and SDF of a wheeled robot with a LiDAR and encoders for Gazebo Simulations
- LiDAR data was used to implement SLAM and object avoidance
- Implemented the A* algorithm for path planning so that the robot can navigate complex environments
- **Relevant Skills:** Gazebo, ROS2, SLAM, Python Programming, Path planning

Automated Bottling Line

- Used Siemens PLC to create an automated bottling line
- Interfaced proximity sensors to detect bottles under the filling valve and bottling valve
- Implemented timers, control loops and level sensors to fill bottles
- **Relevant Skills:** PLC Programming, Timers, Control Systems, Control Loops, Siemens LOGO

Machine Learning for Control

- Implemented Fuzzy Logic controllers and a PID Controller to achieve balance in a self balancing robot
- **Relevant Skills:** MATLAB, SIMULINK Machine Learning, Fuzzy Logic

Object Detection using ESP32

- Used SPI to interface a camera with an ESP32
- Implemented an object detection program using OpenCV that ran on an ESP32 micro-controller
- **Relevant Skills:** Computer Vision, AI on the Edge, Python, OpenCV, Embedded Systems

Line Following Robot

- Designed an IR sensor array to detect the line and interfaced it with an Arduino Uno Micro-Controller
- The L293D motor controller was interfaced with the arduino to control the motors and achieve locomotion
- Implemented a PID controller so that the robot follows the set path
- **Relevant Skills:** Embedded Programming, Circuit Design, PID Control, Sensor Integration

Conferences and Workshops

Asian regional workshop on SciTinyML: Scientific Use of Machine Learning on Low-Power Devices

Technologies and Skills

Languages: C, Python, HTML
Software and Tools: Visual Studio, MATLAB, Simulink, LabVIEW, Proteus, PyTorch, ROS, Git, Micro-controllers, Linux, RTOS
Skills Siemens PLC, Control Theory, Data Analysis, Circuit Design

Certificates

- Python for Data Science and AI Certificate
- Data Analysis with Python Certificate
- Data Visualisation with Python Certificate
- Using Python to Interact with Operating Systems Certificate