ARKAJYOTI BASAK

arkajbasak1211@gmail.com iamarkaj.github.io (+91)9051902862 Kolkata, India
arkajyotibasak iamarkaj iamarkaj iamarkaj

EDUCATION

Thapar Institute of Engineering & Technology — **Patiala, India**
B.E. in Mechanical Engineering — **Jun 2018-Jun 2022**

WORK EXPERIENCE

ROBOTICS LAB - UNIVERSIDAD REY JUAN CARLOS, SPAIN
Software Developer, Part-time — **Sep 2021-Present**
Working on the navigation of UAV using visual landmarks based on **PX4**, **MAVLink**, **ROS**, **Gazebo**. Under the guidance of Prof. JoseMaria Canas, and Pedro Arias.

GOOGLE SUMMER OF CODE 2021
JdeRobot — **May 2021-Aug 2021**
Built the Robotics Academy **Docker** Image for **ROS**-Noetic. Extended the drone exercises from ROS node to web-based template. Added connection protocols and many other features. *Blog*

ATALKI
Machine Learning, Freelance — **Feb 2021-Mar 2021**
Built an **NLP** pipeline for sentence simplification. Trained various models in **Python** that utilized Stanford Dependency Parser and T5-Transformer to achieve optimal generalizability. *Blog*

PROJECTS

DRONE 3D MAPPING & NAVIGATION — **Present**
Developing an algorithm for autonomous navigation of drones in GPS denied environments using SLAM.

EKF & UKF SLAM ON TURTLEBOT3 — **2021**
Created a ROS package *awesome slam*. Implemented EKF & UKF based SLAM with landmark detection using a laser scanner. Built a feature detection pipeline which includes points clustering, circle fitting, and circle classification. Implemented using **ROS**, **Gazebo**, **C++**.

PATH PLANNING & CONTROL — **2021**
Proof of concept for a local navigation algorithm with Artificial Potential Field *Blog*, coverage path planning algorithm for autonomous vacuum cleaner *Blog*, PID controller on a line following robot. *Blog*

AI LEARNS TO PARK — **2020**
Created a 3D parking-lot game in Unity simulator. Worked on setting up the communication networks using socket networking interface. Trained an ANN using Rainbow-DQN algorithm for the agent to self-park. Implemented using **Python**, and **C#** *Blog*

LINE FOLLOWING ROBOT USING NVIS3302ARD — **2019**
Project completed as a part of ED2. Worked on Arduino ATMega 328P, gyroscope, accelerometer, IR, ultrasonic, and ZigBee.

CAPSTONE

FOLDABLE MOTORCYCLE HELMET — **2021**
Designed a hybrid helmet for easy storage and portability. Awarded the **first prize** as overall best Capstone Project. Showcased our product at Industry-Academia Connect program to **win funding by Dassault Systemes**, India. Under the guidance of Prof. A.S. Jawanda and Dr. Bikramjit Sharma.

SKILLS

PROGRAMMING LANGUAGES: C++, Python, Bash
TOOLS / FRAMEWORKS: ROS, Gazebo, Unity3D, OpenCV, PyTorch, TensorFlow
3D SOFTWARES: SolidWorks, Ansys, PTC Creo, Blender