ARKAJYOTI BASAK

ROBOTICS / AI / CV

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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. *Link*

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. *Link*

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**
EKF & UKF based SLAM with landmark detection using a laser scanner. Feature detection pipeline includes points clustering, circle fitting, and circle classification. Implemented using ROS, Gazebo, C++. *Link*

PATH PLANNING & CONTROL — **2021**
Implemented a local navigation algorithm with Artificial Potential Field. *Link*
Implemented a coverage path planning algorithm for autonomous vacuum cleaner *Link*
Stabilization of a line following robot based on a PID controller. *Link*

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# *Link*

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