ARKAJYOTI BASAK

ROBOTICS

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EDUCATION

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

EMPLOYMENT

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

GOOGLE SUMMER OF CODE 2021
JdeRobot — **May 2021-Aug 2021**
Built the Robotics Academy Docker Image for ROS-Noetic and extended the drone exercises from ROS node to web-based template. Under the guidance of Pedro Arias, and Nikhil Khedekar. *Link*

ATALKI
Machine Learning, Freelance — **Feb 2021-Mar 2021**
Developed an algorithm for sentence simplification where the aim is to split a complex sentence into a meaning preserving sequence of shorter sentences. Worked on PyTorch, T5-Transformer, NLTK, Dependency Parser, TF-IDF. *Link*

PERSONAL 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**
Built EKF & UKF SLAM with landmark detection using laser scanner. Feature detection pipeline includes points clustering, circle fitting, and circle classification. Sensor fusion of 2D-LiDAR and odometry data. 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 a ANN using the modified 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 PROJECT

FOLDABLE MOTORCYCLE HELMET — **2021**
Awarded the first prize as overall best Capstone Project. Selected among the top 4 projects by Dassault Systemes, India. Selected for funding by Mechanical Department, TIET, Patiala and 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