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 — **Feb 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*

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*

FOLDABLE MOTORCYCLE HELMET — **2021**
Designed and analyzed a foldable helmet for easy storage. Project **selected for funding** by Mechanical Department, TIET, Patiala and Dassault Systemes, India. Under the guidance of Prof. A. S. Jawanda, and Dr. Bikramjit Sharma.

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.

SKILLS

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