ARKAJYOTI BASAK

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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. Maintainer of *jderobot/drones* and *RoboticsAcademy*. **Language/Tools - Python, PX4, MAVLink, ROS, Gazebo**

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. **Language/Tools - Python, C++, ROS, OpenCV, Html/Css/Js, Docker** *Blog*

DASSAULT SYSTÈMES, INDIA
Industry Internship **Feb 2021-Aug 2021**
Designed a foldable motorcycle helmet. Awarded the **first prize** as overall best Capstone Project. Showcased our product at Industry-Academia Connect program to **win funding by Dassault Systèmes. Softwares - 3DEXPERIENCE, SolidWorks, xDesign, Simulia**

ATALKI
Machine Learning, Freelance **Feb 2021-Mar 2021**
Built an **NLP** pipeline for sentence simplification. Trained various models that utilized Stanford Dependency Parser and T5-Transformer to achieve optimal generalizability. **Language/Tools - Python, PyTorch, NLTK, TF-IDF** *Blog*

EDUCATION

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

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*

SKILLS

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