

# 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](https://github.com/jderobot/drones) and [RoboticsAcademy](https://www.roboticsacademy.com/). 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

B.E. in Mechanical Engineering

Patiala, India

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

A small open-source project [awesome slamlab](https://github.com/awesome-slamlab/awesome-slamlab) to implement SLAM based on EKF & UKF using Turtlebot3. Built a feature detection pipeline which includes points clustering, circle fitting, and circle classification. Implemented using C++, ROS, Gazebo.

### PROOF OF CONCEPTS

2021

Proof of concepts for local navigation algorithm with Artificial Potential Field, coverage path planning algorithm for autonomous vacuum cleaner, 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