ROBOTICS CLUB
IIT DHARWAD

SUMMER OF INNOVATION

2023

Drone Dash

A race to the finish!

Hosted By:

Robotics Club,
IIT Dharwad

PROBLEM

Statement

The objective of Drone Dash is to design an obstacle avoidance algorithm for a drone. There is an onboard colour and depth camera which can be used for this task. You may use any algorithm you like. The goal is to reach the end of the track in the shortest time possible with as few collisions as possible.

The drone should land once it detects an Aruco marker below it (present at the end of the obstacle course).

Team Size: 1-2 Members

Evaluation Components

Component		Submission Format	Submission Date	Weightage	
				Juniors	Others
Setting up development environment		Demo	Friday, 16th June	15%	10%
Navigation Algorithm	Report	Markdown / PDF	Friday, 30th June	30%	25%
	Performance	Git Repository		55%	50%
Landing Algorithm	Report	Markdown / PDF		Bonus Points	5%
	Performance	Git Repository		Bonus Points	10%

* If the total score exceeds 100 due to bonus points, the score will be considered 100.

Report Evaluation

Algorithm (60%)
- Is it innovative?
- Is it effective/efficient?
- How reliable is it?

Experiments & Observations (30%)
- How did the algorithm evolve, and why?

Clarity & Presentation (10%)
- Readability, Neatness
- Completeness

Performance Evaluation

World #1
Released on 17th June

World #2
Released on 24th June

World #3
Unseen World

The final performance evaluation score will be an average of performance scores in worlds #1 to #3.

Development Environment

You will be developing the algorithm for use with the PX4 Autopilot Stack in ROS. The PX4 Autopilot is a flight control software stack for drones. ROS is a robotics middleware that provides a set of tools and libraries for developing robot applications.

You will be using the Gazebo simulator to test your algorithm. Gazebo is a 3D robotics simulator that provides a physics engine, high-quality graphics, and convenient programmatic and graphical interfaces.

Resources

We understand it can be hard to get started. So we went ahead and made a getting started guide to help you out!

Installation Guide

The guide contains a detailed step-by-step guide to install and setup the development environment!

Demo Script

We've provided a demo script that runs a basic demo of the simulation environment which you can use as a base for your solution!

Further Resources

We've compiled a list of resources we feel could be useful for further development of your solution.

Contact Us

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Need Help?

Feel free to contact any of the organizers!

Best of Luck!