MavericksUAS

Fr. Conceicao Rodrigues College of Engineering, Bandra

About Us

We are a technical team from the Fr. Conceicao Rodrigues College of Engineering, Bandra specializing in autonomous systems.

The team focuses on creating Unmanned Aerial Vehicles which have extensive applications in various fields such as search and rescue operations, disaster management, geographic mapping and more.

We have proficiency in designing autonomous aerial vehicles, image processing, systems integration, machine learning and deep learning applications.

We participate in different national and international competitions as a way to test our abilities and keep improving on ourselves.

Participated in the Association for Unmanned Vehicle Systems International (AUVSI) Student Unmanned Aerial Systems (SUAS) competition.

Overall Rank**: 43**
Mission Rank: **31**
Flight Readiness Review Rank: **41**
Journal Rank: **34**
Received "Just Joe Sportsmanship Reward"

Participated in **Operation Rahat** for the year 2017 conducted during the **Techfest event by IIT Bombay**. The team completed the mission in **73 seconds**.

Organized one-day workshop on **Introduction to Arduino** for First Year students in 2017 and 2018.

The team also conducted a workshop on Background to Machine Learning by Dr. Shaunak De.

Successfully designed and fabricated a **Vertical Take - Off and Landing** (VTOL) capable aircraft.

The team was featured in an article titled **"Mumbai's students spread wings with their flying machines"** by the newspaper **'Bombay Times'** for their 7th June 2018 issue.

Problem Statement

SUAS AUVSI 2020 Mission:

Multiple package delivery companies have tasked Unmanned Aerial Systems (UAS) to deliver packages to customers. These UAS must avoid each other, avoid static obstacles like buildings, identify potential drop locations, drop the package to a safe location, and then move the package to the customer's location.

Competition Purpose:

The AUVSI SUAS Competition is designed to foster interest in Unmanned Aerial Systems (UAS), stimulate interest in UAS technologies and careers, and to engage students in a challenging UAS mission. Competition requires students to design, integrate, report on, and demonstrate a UAS capable of autonomous flight and navigation, remote sensing via onboard payload sensors, and execution of a specific set of tasks.

SUAS AUVSI 2020

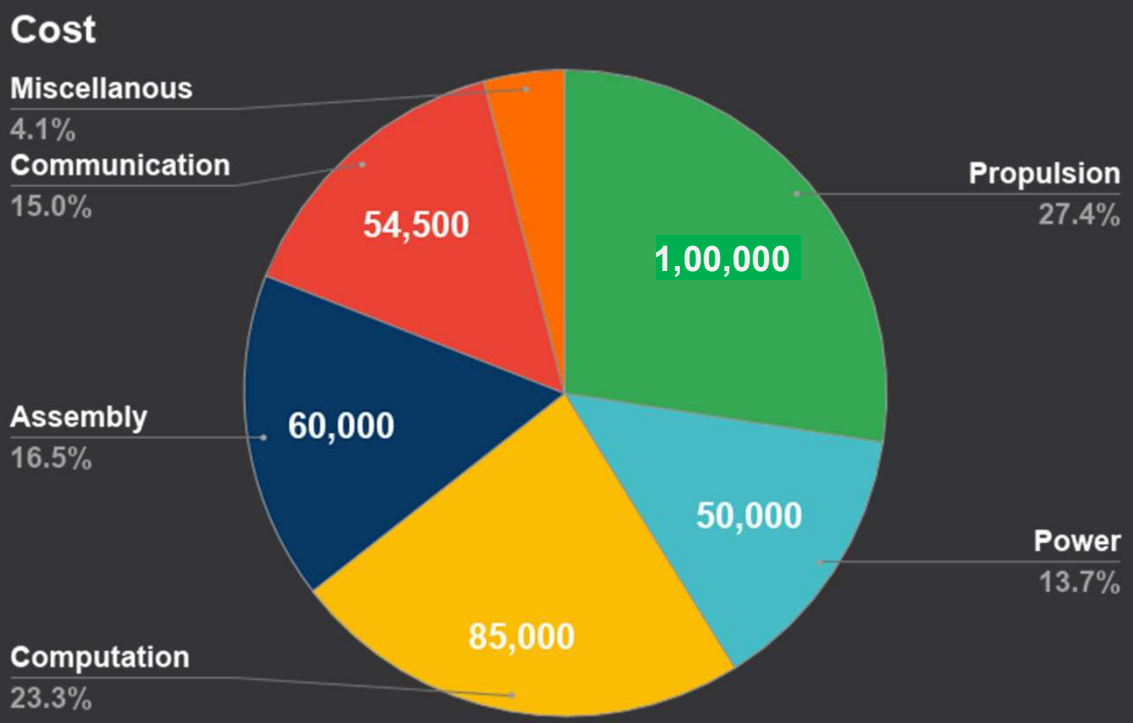
The **Aerial Unmanned Vehicle Student International** is an autonomous drone competition wherein participants are supposed to design and develop a drone adhering to the following key points:

- **Autonomy**: Takeoff, waypoint navigation, parallel process execution and landing at a safe location autonomously.
- **Obstacle Avoidance**: Implementation of obstacle avoidance algorithm in order to dodge other drones in air and static obstacles defined by information provided by competition Interoperability Server.
- **Image Processing**: Object detection, Localization and Classification to identify landing points marked with alphanumeric characters using onboard computing.
- **Payload Drop**: Dropping an autonomous UGV at a safe drop location to deliver the payload to its final destination.
- **Ground Control Station**: Communication with drone sending obstacle information and receiving telemetry and images. Manual flight link and flight termination system. Also the GCS must forward data to the IOS for judging purposes.

Competition date: June 2020

Competition location: Naval Air Station, Maryland, USA

Financial Breakdown



Total: 3,64,500

1. **Propulsion:**
   - High performance Motors
   - High end ESCs (Electronic Speed Controller)
   - Carbon Fiber Propellers

1. **Power:**
   - High end Batteries

1. **Communications:**
   - Radio Transmitter and receiver
   - Telemetry radio
   - Mobile Radio Set
   - Long Range Wi-Fi

1. **Computation and Imaging:**
   - Drone Cameras
   - On-board Computer
   - Flight Controller

1. **Assembly**
   - Airframe
   - Drop Mechanism
   - Stabilised Camera Mount