Indoor Drone Flight Control

Team: Richmond Aisabor (CS), Jeffrey Taylor (CS), Ryan Gloria (EE), Caroline Hall (EE)

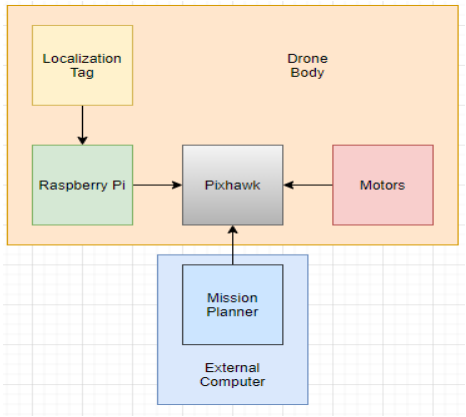
Project Overview

- The project's purpose is to build a Multi-Dimensional Drone Communication Infrastructure (MuDDI),which will enable indoor and outdoor experimentation with Unmanned Arial Vehicle (UAV) to address research issues for indoor use of drones
- The next wave of applications for UAVs such as delivery of consumer goods will require coordination of various entities across various altitudes
- SMU MuDDI needs a streamlined localization solution that ties together the existing infrastructure with the necessary requirements
- The solution is to create an indoor drone flight control system.

Tech Stack

- Cython language to implement the localization algorithm
- Python scripts to automate mission planner flight planning
- Bash scripting to automate command line execution of localization algorithm
- Docker container to allow Mission Planner use on Mac OSX

Hardware



Software

- Mission Planner: a full-featured ground control station application that can be used as a configuration utility or as a dynamic control supplement for your autonomous vehicle
- Localization algorithm: Translate cartesian position relative to the anchors into GPS coordinates.

Technical Solution

- The Indoor Drone Flight Control System (IDFCS) is an existing localization solution that consists of local nodes, called "anchors", which translate the (x , y, z) position into a GPS coordinate.
- The flyable space consists of the anchors placed on the four corners of the flyable space and the netting that protects the drone from flying out of bounds.
- The drone will fly through the space given a route and sends flight data back into the system, so that Mission planner can track the drone's flight.

Raspberry Pi

python™

MissionPlanner

SMU | LYLE SCHOOL OF ENGINEERING