FlySense

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Team C: FlySense

Teammates: Shivang Baveja, Joao Fonseca, Harikrishnan Suresh, Nicholas Crispie

ILR 06

February 1st , 2018

Work done

We spent the last semester developing the proof of concept set up on a ground station. This semester the objective is to get the system on air and add some features that will improve the way information is represented to the pilot.

Since we are using a quadcopter to simulate the helicopter, and the pilot is not actually flying it, we need to develop a way for the pilot to get a natural feel of it. Therefore, the first thing I will be working on is developing a FPV screen to be viewed on the epson augmented reality headset.

We have also been looking at developing a speech recognition system that can essentially work in noisy environments. I have been looking into ways that this can be done during the break and have realized that this can be simple or challenging depending on the datasets that we can acquire.

Coming to the team, there has been a lot of work going on in the last few days. Shivang has been working on setting up the quadcopter and has conducted a few test flights along with Nick. Hari has been working on getting started with the Jetson TX2 (I had the system setup initially during the holidays, but due to some compatibility issues with the Orbitty carrier board, we need to flash it again). Joao has been developing algorithms for the quadcopter to accomodate the third dimension and rectify direction issues we had the last time.

Finally, since we are planning to do a few test flights on campus, we are alson applying for permissions to fly quadcopters here. The process seems a bit slow, but hopefully will be ready with all the required permissions in a couple weeks.

Challenges faced

- Since we need to get the quad in the air, we need reduce the weight as much as possible. We have been doing extensive research on ways to reduce weight and have figured out a couple possible solutions to this.

- It seems difficult to develop a speech recognition system specially since we do not have the time required to develop a speech dataset from scratch. This might be a big dent in the speech plans and we

might as well drop this in case it doesn't go well along with schedule. The backup plan is to keep using the Sphinx libraries for android.

Teamwork

Name	Contribution
Shivang Baveja	• Timeline for quad flight tests and development • Flight dry tests • Hardware setup for quadcopter • Obstacle avoidance algorithm with Joao
Joao Fonseca Reis	• Obstacle avoidance algorithm • Sound warning corrections • Switching algorithm design from 2D to 3D
Harikrishnan Suresh	• Reflash Jetson TX2 • Research on Point cloud registration
Nicholas Crispie	• Initial flight tests to check if it is flight ready • Quadcopter hardware component selection • Project management

Plans

For next week:

- Make a final decision on having or removing speech recognition from the project.
- Perform flight tests with dummy weights
- Setup the onboard computer system
- Finalize design changes for headset application

My tasks:

- Add a screen for FPV video display on the headset
- Setup an offboard Jetson processing center to develop better visuals for the pilot