FlySense

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Team C: FlySense

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

ILR 06

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Work Done:

Firstly, we have successfully got the FVE set up on the quad with all functionality intact. My contribution has been in making changes to the Epson code (laptop is back from the dead :D) to accommodate the change in communication system so that there are no issues in exchanging information.

Since the next step is to get image frames from the FPV camera on the quad, I had to set up OpenCV and other required packages on the system. This seemed like a trivial task in the beginning and I estimated that it would take an hour at most, but I was so wrong. It took me 2 days to figure out the correct sequence to install OpenCV3.3 without disturbing CUDA dependencies. Only after I had to install Ubuntu for a total of 3 times I realized where I was going wrong (latest CUDA 9.1 has changed names of some of its files which created the issue).

Now that the system is setup, I am working on getting camera feed and processing it for segmentation of specific obstacles as Basti suggested. Joao and I are also looking at options to extend scope of this in a way that adds value to the project.

Challenges Faced:

- One of the major issues in our system is that whenever we switch between screens, there is a considerable delay added because of connection changes between ROS nodes. There doesn't seem to be a good solution to this other than using a single connection to transfer all data throughout the application (but this again induces lag). So, we are considering dumping everything onto a single screen so that the pilot doesn't have to manually switch between screens. We are yet to finalize on this.
- As described above, installing OpenCV is problematic. I think I would write some tips on wiki regarding this. But again, the tips won't help once the newer version of CUDA is released.
- I think I overburdened myself by taking two subjects with very heavy course load. It's even becoming difficult to attend MRSD class in the mornings as we spend all night reading research papers for VLR class right after. Hopefully the spring break will be a respite.

Teamwork:

Shivang Baveja	• Flight tests • Quad setup
Joao Fonseca Reis	• Algorithms for flight path and sound warnings • Developed pseudo code in Matlab for map colouring
Harikrishnan Suresh	• Porting Joao's matlab code to C++ to deploy on the quad for tests
Nicholas Crispie	• Flight tests • Hardware procurement and quad setup

Plans for next PR:

1. FPV video streaming from camera on the quad through ROSJava
2. Possibly streaming the FPV video as a background in the Epson screen