Fly Sense

Team C – ILR03

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Work done this week (User Interface Design)

- Meeting with professor Jack Mostow – with Nihar
- Prepared first mockup of the AR interface – Nihar
- Detailed struct of the interface between Epson BT-300 (AR headset) – with Nihar
- Detailed voice command tree – with Nihar

The key take-away from the meeting with professor Jack Mostow:

- Noise cancellation
    o Strong non-directional white noise in the background
    o Two mics solution can be used to cancel the background noise (wave subtraction)
    o Noise cancellation mics use this same principle

- Voice commands menus
    o Can easily be used to navigate through a menu
    o Need to be self-explanatory avoiding the memorization of "magic words"
    o Should use words that are very phonetically distinct (e.g. never use b, c, d)
    o Should avoid false positives (when the "magic words" are used for a different use)

Problems Faced this week

The week of the sensors and motors was a great week as we worked a real team. Then we had the MEC exam that broke that dynamics.

This week we started again gearing up our work as a team and we had several successes:

a) A first demo of the AR interface (written by Nihar)
b) Initial Velodyne data was run on the Jetson TX2.

Achievements of the week

In the user interface, we had a few more achievements:

a) Identified a speech recognition library for Android that works offline (will be used for the voice commands feature)
b) Identified a 2D sound library for Android that accepts a frequency value and intended amplitudes for the left and right ear (will be used in the sound warnings)

My biggest contribution this week were:
- Detailing the specifications of the Epson-Jetson interface (with Nihar)
- Structure of the voice menus to be deployed (with Nihar)
- A good contribution to the team with key contributions to the reports due this week: "System Engineering Presentation 2" and "Progress Review 2".

The rest of the team had good achievements in getting the Velodyne data up and running in the Epson, further advancing the Velodyne data processing techniques.

Milestones for next three/four weeks:

With Nihar:

a) Get the AR interface working
b) Deploy voice commands in the AR
c) Deploy sound commands in the AR
d) Test noise cancellation (two computers, noise cancellation mic....)

With Shivang:

a) Segmenting the Velodyne point cloud with simple rules (to focus processing power)
b) Using quadcopter dynamics to color the point cloud
c) Using helicopter dynamics to color the point cloud

With the entire team: Design and prepare the Fall Validation Experiment.