

Location: WRC Meeting Room

Date: 10/9/24

Time: 1-2pm

Attendees

- Benjamin Ireland
- Se Hyun Kim
- Ronniel Padua
- Andreas Willig
- Graeme Woodward
- Raith Fullam

Apologies

Agenda Items & Notes

Objective

This meeting is used to share announcements and project updates. Please add your weekly updates to the agenda below. Guidelines are to share 2-3 high point updates on your progress since our last meeting and what you are going to do for the next week.

- **Topic 1 – Successful target tracking flight**
 - **Show video.**
 - **Multi-drone once drone 1 is fixed and drone 3 is linked to controller.**
- **Topic 2 - Final Inspection Feedback**
- **Topic 3 -**
- **Topic 4 -**

Minutes:

- **Topic 1 – Final Inspection**

Some parts not happy about: No multiddrone tests yet. Aim for it to be done by oral presentations.

Explain more about role on gazebo. From gazebo sim to real life once hw issues fixed

GUI -> Definitely should have gone with having the live GUI displayed, even if not completed.

Props were good otherwise.

Dress up for the oral presentations.

Ben -> Was intro good enough

Graeme -> No main problems. Talked clearly and spoke well

Finlay -> Did our delineation parts of our projects make sense

Graeme -> Made sense, no main issues. Due to Ben and Finlay working together, hard to separate each other's work

Take ownership of engineering decisions made. Good to be working together is expected and desired.

- **Topic 2 - Main Point**

Ben -> Drone issues (again). One drone gives a **hard** fault. Still has error after reboot. Needs to go into the microcontroller on the pix4. Internal hard fault. Drone 4.

G. 5 should be available to fly

B. One for the target. 4 that are working (probably)

F. One drone was crashed and power pins have snapped off. Can possibly use drone 1

B. Rest of drone 1 works just fine.

F. Need to make a new wire

B. Drone 2 is up and running for a flight test. Play flight test video. 6m north of finlay (holding target).

G. Pushing drone away

(Video -> Drone is moving away from finlay who is moving with the target)

B. Also follows Finlay. Changing gains on controller whilst flying it.

F. Do very long flights with testing

G. Surprised gains can be changed mid-air.

B. Happy that it works.

B. Pretty confident can go for multi drone swarm. Some shift on the horizontal position

G. Movement is relative to the target, all translational? What control over the heading of UAV.

B. Taking movement of target. If target goes north, drone also goes north and turns towards north. Offset can be changed too.

F. Original had no heading of the target. Not want to rotate entire swarm.

G. In a circle, outer drone has to move faster to cover same angle.

G. at some point in a circle, the outside drones will be the drones in the inside. Has some implications with drones going in a circle.

B. Assumed there was unknown usecase for the coordinate system rotating with the target.

G. All of this is Euclidean rectangle stuff

B. Yes.

G. What are plans for next step?

F. Got to fix drone 1. See if two drones can work together.

B. Drone 3 working. Just not working, no battery for the controller for drone 3. One of the tuba ones.

G. Should have many fataba controllers. Should be at least as many batteries as controllers.

B. Should get drone 3 running as well. Would be fine to do two tomorrow.

G. Legal restriction, cannot fly at night

B. Should be okay to fly tomorrow morning. Not likely to progress on the day.

F. Tuning pid. Target only updates every so often. Controller can be quite jerky. Can make it less responsive, so it lags behind the target. Fast controller can keep up but may be too reactive.

G. That is why they used velocity based last year instead of waypoint based

B. Went back to velocity based instead of waypoint based as the propellers were moving too fast.

G. Have to look at tradeoffs. Is there overshoot? Controller in Pixhawk avoids overshooting and coming back.

F. Pixhawk has good internal control.

B. All of it is proportional gain. Derivative gain causes drone to not move

Rai -> Meeting with andreas and networking. Also issue with last year's code. No way of getting integration done this year. Working on testing the drone on getting payloads from drone. 5ms payload from drones. Updates correctly. Slight issue with last year's code with 0.5s sleep. Removing this causes hundreds of packages per second.

G. How is this being tested.

Rai. Being tested on the raspberry pi.

G. Network would be good to test on. Understand cannot integrate, but would be good to do it in a representative place.

B. Have good response from raspberry pi's antennas.

G. Even with heatsink?

B. Even with heatsink on top. Change in PID gains sending, only once.

G. This is done through wifi access point?

F. Peer to peer not yet working, so using wifi access point.

B. Testing for range on the packages.

G. Hence why rai needs to test on representative environment.

S. Target seems to be working pretty well. Want to log information.

G. Moved from having separate target to using an actual drone and using the GPS. Was this an experiment.

S. Drone GPS runs at 100hz and the GNSS receiver is superior. Hence we are using the drone target as a GPS.

G. Can we buy a GPS unit.

S. Can be bought and plugged into a raspberry pi.

G. Please make a request for a better GPS unit. Ones on the drone are very specific for drone, comes with IMU too. All drone specific.

B. Can probably buy just a GPS, but have to take off the unit from the drone.

F. Formation only translational because no heading direction. With heading direction, can possibly control swarm.

G. Make a recommendation to me, if it is local e.g pbtech or digikey. Alternately remove from non working drone.

F. Might need to make a specific adapter to connect to USB.

G. Look for same model with USB adapter. Buy if it is around \$100. Only cares about time from overseas.

S. Will look for an alternative.

B. Best to start from the Pixhawk website, looking for some.

G. Alternately, hobby shops work.

Ro. Webserver being worked over.

G. Not just sending generic files. Go back to original brief, for configuration files have been sent correctly, and everything has been sent correctly,

F. A lot of the config file needs manually . TO make it easier to download data to drone, there is now a config for the config file to be downloaded and then uploaded to drone.

G. Consider issues with multi-hop network, does this handle it?

Rai. Can be used wherever and send the bytes.

G. Even with a 10MB file.

Rai. In theory, it can be sent, but will be slow.

Ro. Config file size is ben and finlays.

F. 40MB's back to update.

F. Finlay is making drone responder, looking for a discovery using DNS.

Ro. Just to confirm. Send ifles, check files and directory and on the drone. Check they the correct version, and then tell user if the drone is ready to fly. (Last part critical!!).

G. Avoid talking about files too much since it sounds too generic. Make it more specific to the application. How this can be presented by talking about the configurations being sent over.

G. Oral presentations in 2 weeks. Need to practice beforehand. No props, but can use AV instead.

b. One of us should be videoing.

G. Orals are more formal than the other ones. Timing much more strict. Light on 1 minute to go. Once done, will be interrupted past on

F. Oral presentation is less technical than the final?

G. Wouldn't say any less technical. Won't be as interactive.

B. Should try to have a mock by the end of the week.

G. Week afterwards on handover. Everything checked in on repository, ensure G. is on repo (and Andreas too).

B. Have two repos (one for the Pixhawk, other for the one from last year).

G. Final reports a week after that. Happy to go over the feedback.

B. Wrapped up here

- **Topic 3 -**

- **Topic 4 -**