

Weekly Status Report 10

Quadcopter Cameraman

sdmay19-42

November 12 – December 3

Aamid Ahabab (Lead Engineer) & Client

Zhengdao Wang (Team Advisor)

Alex Nicklaus (Lead Test Engineer)

Isaac Holtkamp (Web Manager)

Nate Allen (Report Manager)

Luke Rohl (Meeting Facilitator)

This week's accomplishments

Summary

- Alex
 - Attempted to get RTOS on Pi
 - Got a separate Pi for testing the RTOS
 - Built ChibiOS and put it on SD card
 - Unable to boot Pi
 - Consulted with group mates to troubleshoot problems appears that power was not an issue
 - Ordered personal extra flight controller that group can use in case the other one does not come in
 - Completed laser cutter training
 - Group now has access to laser cutters if needed
 - Some proposed uses
 - Create new mounting plates for the drone to expand capacity
 - Create mounting jigs for the camera and sonar sensor
- Nate
 - Met with Luke and worked through theories for target recognition/acceptance
 - Created a list of variables and generated scenarios based on permutations of those variables
 - Deemed each scenario to be one of four categories
 - Optimal - Consists of one scenario only, which assumes happy path
 - Acceptable - The scenario is not optimal, but it is still considered a marginal success
 - Deductive - The scenario constitutes one where we have not definitely found the target, but we were able to logically deduce where the target it
 - Unacceptable - We have no idea where the target is within the frame
 - Wrote pseudo code for the algorithm of tracking the target

- o Setup of Python environment on Pi
 - Flashed image to an sd card
 - Installed matplotlib
 - Installed scipy
 - Installed scikit-image
 - Installed imutils
 - Installed cv2
- o Tracking
 - Added tracking based on Euclidian distance
 - Added ability to code to decide whether to use face recognition or euclidian distance
 - Use face_recognition when no target has been previously recognized
 - Use euclidian distance when target has previously been recognized
- Luke
 - o Met w/ Nate about target tracking variables conditions, confidence ratings, etc. (See above for more info)
 - Was able to setup a python-to-c socket communication. This will be used as our go between when converting from python logic to MultiWii commands.
 - o Met w/ Isaach about bluetooth communication.
 - We continue to run into issues establishing socket connections. Once the sockets successfully connect then we should be able to send data and act upon those commands/data.
- Isaac
 - o Worked on communication with pi
 - App cannot connect with pi to allow data stream
 - Fixed layout of the app
 - Worked on optimizing how messages are sent to the pi
- Aamid
 - o Worked on Project Plan, Design Document, Powerpoint Presentation
 - Created wiring and component layout diagrams
 - o Got the integrated PDB to function properly
 - o Started designing hardware tests for functionality
 - Motors and ESC
 - Battery
 - Discussed tests for thrust calculations with Alex
 - o Final end of Semester Quadcopter Design Finished
 - Finalized components to be used for this semester (integrated pdb and pi power source usage)
 - Recalculated flight time and determined that all components CANNOT be powered by the battery and pi power source will be needed

Planned to accomplish next week

- Nate
 - o Improve tracking ability to decide how to track

- Use directional velocity infer two targets who's paths intersect
 - If two objects approach each other, intersect, and then depart from each other, preserve target priority based on the direction of targets before intersection and direction of targets after intersection
 - Use the target's predicted next location when sorting by euclidian distance. This should force the above point to work by default since the predicted point will be projected in the direction of travel. Thus the object traveling in the direction will automatically be closer.
- Luke
 - o Pi OpenCV issues
 - Determine a standard method for getting all the required libraries onto the pi and able to run the code we currently have.
 - o Android-Pi bluetooth communication
 - This is our top priority because this is required for our end of the semester milestone of getting the drone able to fly by the end of the semester.
- Alex
 - o Cut out acrylic square
 - We'll need an acrylic square for house power source
 - The drone
 - o Continue with ChibiOS on Pi
 - Struggled to get Pi to work because the power source was believed to be insufficient
 - Troubleshooting demonstrated otherwise
 - Going into ETG to get some help
 - o Update profile
- Isaac
 - o Android-pi bluetooth communication
 - Get pi to communicate with the app
 - Get simple commands working fully
 - Send data back to app
 - o Work with Alex on ChibiOS
- Aamid
 - o Assemble and wire drone
 - Need acrylic base to be completely finished
 - o Flash Multi Wii to the Flight Controller
 - o Design Tests for Flight Controller to see if functional
 - o Test Motors and ESC

Roadblocks

- Installing python environment on Pi
 - o Having trouble fulfilling dependencies for face_recognition package.
- Bluetooth communication between pi and android app
 - o Having issues establishing a connection
- Couldn't get adequate power supply for Pi over break

Hours Spend

Team member	Hours This Week	Hours Total
Nate Allen	10	63
Alex Nicklaus	10	58
Luke Rohl	9	58
Mir Ahbab	17	56.5
Isaac	10	50

