Alex Marc  
ECE 4902 Group Meeting 1  

Goal: Starting construction of drone frame
Alex Marie

ECE 4902 Group Meeting 2

Jan/31/20

We will finish the order. Cross by May.

Brian - mount Odroid and Roycam onto the drone

Alex - get the Roycam working

Brandon - get the Pixhawk to interface with the Odroid and get the drone running and flying

Possible protocols to interface with Pixhawk:

- UB
  - Serial/RS232
  - SPI
  - CAN

Pixhawk has to interface with Odroid in Linux

Goals:
- Recognize fixed-size objects in Pixcam in order to translate
  more coordinates into another coordinate system, extract information
  from the Pixcam from the objects, communicate with Pixhawk (will work with Brandon)
Option 2

Pixy2
SPI
Pixhawk4

Brandon: making drone work
Alex: working on getting the Pixy2 to work
Brian: J (around Mon.)
Goal: Finish project within the next five weeks. After the fifth week, create a video of project in case it does not work during demo day. Deliver weekly presentations detailing the progress made during the completion of the project.
Alex Marie
ECE 4902 Group Meeting 4
Feb 14, 2021

Worked on getting aPix2 to detect objects

- Alex: figure out how to collect data from aPix2 (x, y coordinates)
  - key to getting a system working
  - brainstorm getting the drone to work (lift, fly) and troubleshooting

Brian: 3D printing

- drone DLR
- Python code
- 3D print controller
  - uses Raspberry Pi
  - reads data

Data received from aPix2 (ex: Arduino):
- block!, object dimensions
Alex Marie  
ECF 4402 Group Meeting 5  
Feb 10/21

- Goals: programming the communication system of the drone.
- Alex: application logic for building the parser (see pdf parsing guide) -> go to serial protocol. Will program send and request packet, then parse or decode the received packet.
- Brandon: building the SPI communication layer. Do not worry about the actual sending or receiving.
- Brian: focus on the physical design of the drone, order propellers, focus on flying the drone.

Sends:  
0x0e  
0x00

Receives:  
0x0f  
0x04

- We need to decode these #s

- Each packet type has its own response

Download code blocks setup (see picture)
- SC1 protocol

- Pyx2 comm.
- Request = Response

- Features:
  - Binary encoded (not ASCII text)
  - Represented as little-endian two's complement
  - Simple request-response data exchange
  - Query latency of less than 50ms

- Packet structure:
  - if no checksums used:
    - 2 bytes of no checksum-sync
    - 1 byte for packet_type
    - 1 byte for data_length
    - data_length number of data bytes
  - if checksums used:
    - 2 bytes of checksum-sync (0x100f)
    - 1 byte for packet_byte
    - 1 byte for data_length
    - data_length number of data bytes

- Code:
  - #define Packet_Send()
  - #define Packet_Receive()

- refs:
  - See Color Connected Components API (graph, image, blocking, iteration, etc.)
  - Use Pyx2CCC.h code
Alex Maric

ECE 4902 Faculty Meeting 2

- Goals: Start testing and videoing the drone by mid-March.
Alex Maric
ECE 1902 Group Meeting 6

- Final: Continue testing and debugging programs Ex: SPI-Avoid
  - Insert
- Take all tools and supplies from workspace in case of school
Alex Maric

ECE 49102 Group Meeting 7

- Goal: get the drone to work, work on design review presentation (starts after spring break)

- Brian - get the motors to spin and stabilize
- Alex & Brandon: focusing on the software, communication interface, read information from Prox 2, integrate Pixhawk4 with drone (hardest part), may require all team members to

- Pixhawk4 software: figure out how other people design things

- How to communicate with SPI, function calls in Pixhawk4

- Once we establish a communication channel, figure out where do put the send and receive function calls

- Find where in the code Pixhawk4 calculates position (xy), velocity, attitude and velocity and other calculations. Find how do we hook into the system? Do we need another flight mode?

- Figure out how to hook into the autonomous system? Do we need another flight mode?

- No gripper design for the project.
Alex Marin
ECE 4902 Faculty Meeting 3
Mar/27/20

* Goals: wrap up remaining senior design coursework left for the semester

* Brandon - (i) integrating communication layer with B-chawk4 flight controller/TeX flight stack, (ii) calculate recognized object's position using the recognized object information, (iii) using the calculated position as waypoints for autonomous flight

* Alex & Brian - work on remaining write-ups left (ex: project review, final project presentation) for the semester
Alex Marie  

ECE 9902 Group Meeting #8  

May 29, 2020  

- Goal: finish up technical aspects of drone, start working on the project report.  
- Brandon: keep working on the drone  
- Alex & Brian: write a 3-5 pg. report on RA stock (to be used for final report)
Alex Marc

ECE 4902 Group Meeting 9

- Goals: finish drone and remaining write-ups
- Brandon - work on calculating package position/coordinates of drone
- Alex and Brian - work on final project report
Alex Marie
ECE 4902 Faculty Meeting 4

Goals: keep working on remaining tasks for the semester

- Brandon: showcase calculation of position of objects in relation to the drone
- Alex & Brian: keep working on the final report

Demo Day video ideas:
- break the video into four parts corresponding to our four design phases (drone development, computer vision and object recognition, package position calculation, autonomous navigation) and have a brief 2-5 minute segment on each part. In each part, one team member would narrate over the work we’ve done and highlight the novel things about our project.
Alex Marie

ECE 4902 Group Meeting 10

Goals each group member should do an individual presentation on their role in the project

- Brandon - no autonomous flight, no tracking, work on video
- Alex & Brian - work on video

- Drone Video Demo:
  - Part 1 (Phase 1) - development, troubleshooting drone
  - Part 2 (Phase 2) - Pixycam, getting it to work, show pictures with Brian, interface with Pixycam, showing R2
  - Part 3 (Phase 3) - integrating with R2, show drone flying around
ECE 4902 Group Meeting 11

- Goals: Finish up poster and final report. Upload all senior design documents to the website.
- Brandon: Work on poster.
- Alex & Brian: Update the final report.

Alex More
Apr/29/20