Sprint 3 Conclusion Meeting

Long Flight Time Buoyant Drone 2/20/2021 7:30 - TIME(PST)

horizontal lineATTENDEES

* Excused absences:
* Unexcused absences:

## AGENDA

* **Review of progress:**
  + Dylan-7:34
    - Finding Envelope Design
      * Do a force analysis of drag in order to find optimal design
      * Complete and accepted by time
    - CAD Draft 2
      * Updating the CAD file with the new envelope and changing component sizes to fit the new design. FInally, include electronics
      * Incomplete. CAD file updated for envelope, but electronics not added in
    - Force Diagram
      * 3D force diagram based on new CAD model
      * Incomplete due to problems with solidworks. May change to 2D diagrams
    - Decided on Motors and Servos
      * Dependent of force diagram so incomplete
  + George-7:40
    - RC throttle control
      * Throttle adjustment to eliminate unintended yaw moment
      * Complete
    - Define characteristic differential force equations
      * Find differential equations of movement for the drone
      * Complete
    - Find transfer functions
      * Incomplete. Started change into state space design instead after seeing it is the best option and we have time constraints. Did not make significant progress due to struggle in generating differential equations and the learning curve needed for discrete time MIMO state space systems
    - Design overall controls
      * Incomplete
    - Use simulation to define gains
      * Incomplete
    - Implement in C libraries
      * Incomplete
  + Isaac-7:50
    - Added forces into objects on V-rep
      * Force can be applied in all directions by GUI
      * Testbench shows that the functions work
      * Complete
    - Created a GUI to work with the forces in the simulation
      * Corresponded rotor speeds to forces
      * Implement servo rotations to change direction
      * Incomplete more work will be done the following week
    - Import new CAD design
      * Move parts
      * Simplify polygons
      * Incomplete relies on CAD design Draft 2
  + Jeremy-7:52
    - Complete Power Budget
      * Analyzing the power requirements of all parts in the bill of materials within one cycle of the drone’s use
      * Complete
    - Simulate components with Eagle CAD
      * Use Eagle CAD software with PCB schematic of drone’s confirmed components to simulate their power draw in one cycle of the drone’s use
      * Incomplete
  + Ryan-7:54
    - Work on second PCB design with surface mounting
      * Replace all through hole footprint devices with surface mount footprint devices
      * Complete
    - Implement Raspberry Pi into PCB
      * Implement hardware connection between Arduino (ATMega328P) and Raspberry Pi Compute Module CM3+
      * Complete
    - Help Leon with cameras
      * Find an acceptable live stream camera setup
      * Incomplete- All-in-one RX, TX and camera components selected but missing display output solution that accepts RX coax cable
  + Leon-7:55
    - Get sensors and other parts working with microcontroller
      * Wire up IMU, ultrasonic, barometric, and GPS with the proper connections, and verify that they are detected correctly in software
        + Complete
    - Be able to read data from the sensors
      * Read from the sensors with the right protocol and verify that their data makes sense
        + Incomplete: IMU, ultrasonic, barometric sensors read from but not GPS sensor yet
* **Team Improvements**-7:57
  + Improvement shown from last sprint
    - Better goals, allocated time more reasonably
  + A lot of incompletes, need more realistic sprint goals
* **Individual Improvement**-8:00:
  + Dylan
    - Improve sleep schedule to get more work done earlier
  + George
    - Set more realistic goals. Especially with how fast I can learn stuff
  + Isaac
    - Keep motivation up as the sprint goes on
  + Jeremy
    - Set more realistic goals for sprint tasks
  + Ryan
    - Make sure every task is well defined, keep momentum & consistency going
  + Leon
    - Better time management with other classes & sleep schedule
* **Next Goals**-8:03:
  + Finish all incomplete tasks (ALL)
  + Prep for design review, fix slides
  + Fix slides by Tuesday meeting to send to Alexey for feedback
  + Dylan - look more at UHMWPE, do analysis/pugh chart to decide on best material
  + Leon - demo for design review, like a video
  + George - rough simulation of RC control and Autonomous control
  + Ryan - verify Camera RX & TX works with display.
  + Isaac - have my GUI working to demo
  + Jeremy - use Eagle CAD simulations to get power draw of components
* **Other Business**-8:09:
  + Mircea will be able to meet next week after Gordon finishes his Thesis
    - Ask for paperwork of confirmation that we can use Delaware labs
  + Motor workshop is on Monday, most of us should go

Meeting End: 8:20