Sprint 6 Start

Long Flight Time Buoyant Drone March 29, 2021 6:00 PM(PST)

horizontal lineATTENDEES

* Excused absences: N/A
* Unexcused absences: N/A
* Late: N/A

## AGENDA

* Administrative Stuff

6:01

* Updates
  + Leon: Looking at videos to power motors and servos
    - Also got servo shipping and motors should be coming soon

6:02

* + Jeremy: Updated motor power on the Power Budget, added camera
    - Flight time still is at least 30 minutes and can reach 1 hour

6:03

* + Isaac: Drag force implemented based on the velocity of the envelope
    - 30% complete to having drag fully implemented

6:05

* Dylan: Added RC transmitter to CAD, new voltage regulator as well
  + Helium vendor almost finalized, can either rent a large can or get a small can and refill it

6:11

* George: Mircea replied to funding email

6:15

* Ryan: Wiring Schematic finalized
  + Needs to work on BoM and PCB board before sending to Leon

6:17

* Gantt Chart Updates
  + CAD design still needs to add newest parts

6:22

* Add a presentation slide for all sensors working together
* Servos/Motors will need to be worked on, servos have arrived to test

6:25

* Path following should be done by 4/2, previously was 3/29

6:27

* Board Wiring and BoM should be finalized by tomorrow 3/30
* PCB design should be verified by power design on 3/31

6:40

* Leon is the SCRUM master for this sprint from 3/29/21 - 4/26/21
* Define Goals (General, see where we need dependencies etc)
  + Dylan - 6:46
    - Update CAD with newest parts (camera, receiver, voltage regulator) (4/2)
    - Fabricate Prototype (4/26)
  + Isaac - 6:50
    - Implement Drag Force (4/5)
    - Implement Sensors (4/13)
    - Implement Closed Loop Remote Control (4/19)
    - Implement Autonomous Design (4/26)
  + Leon - 6:52
    - Implement electronic actuators in software (ESC, motor, servos) (4/2)
    - Implement remote control in software (4/9)
    - Implement autonomous control in software (4/23)
  + George - 6:55
    - Closed Loop Remote Control designed and tested in Matlab (4/12)
    - Path following and terrain tracking ideal sensor model designed and tested in Matlab (LATE estimated completion on 4/3)
    - Path Following and Terrain Tracking-Noisy Sensor model designed and tested in Matlab (4/12)
    - Auxiliary Flight functions (4/26)
  + Ryan - 6:58
    - Finalize BOM PCB parts (3/30)
    - Wire up PCB (3/30)
    - Verify PCB with power management (3/31)
    - Send out PCB design to manufacturing (4/2)
  + Jeremy - 7:03
    - Finalize Power Budget when parts list is finalized (4/2)
    - Finalize/Optimize battery to fit within technical requirements of flight time (4/5)
* Define End Date 7:07
  + Sprint end: 4/26/21
* Tasks (Specific) List Requirement ID if available. Time estimate
  + Leon (140 hours) - 7:15
    - Implement servo control (10 hours)
    - Implement ESC/motor control (10 hours)
    - Implement remote control communication with Raspberry Pi (10 hours)
    - Implement servo control with remote controller (10 hours)
    - Implement ESC/motor control with remote controller (10 hours)
    - Implement autonomous control data processing between PIC32 and Raspberry Pi (30 hours)
    - Implement servo control with autonomous control (10 hours)
    - Implement ESC/motor control with autonomous control (10 hours)
    - Group meetings (25 hours)
    - Sub-team meetings (15 hours)
  + Jeremy (123 hours) - 7:22
    - Verify PCB Design (4 hours)
    - Finalize Power Budget by double checking all parts and heat efficiencies (10 hours)
    - Optimize Battery once power budget is finalized (4 hours)
    - Group meetings (25 hours)
    - Sub-team meetings (15 hours)
    - Push ECE121 code to Github(1 hour)
    - Program C libraries for Linear algebra, integration, and other functions needed for controls (16 hours)
    - Program C libraries RC response (16 hours)
    - Program C Libraries for autonomous (16 hours)
    - Program C libraries automated landing and takeoff (16 hours)
  + Isaac (152 hrs) - 7:31
    - Implement Drag Force **(30 hours)**
      * Calculate Balloon Speed (10 hours)
      * Create 3D Drag Force (10 hours)
      * Apply Logic to Drag Force Given Balloon Speed (10 hours)
    - Implement Sensors to Read Pseudo Data from Vrep **(22 hours)**
      * Research Sensors (6 hours)
      * Implement Ultrasonic Sensor (4 hours)
      * Implement IMU (4 hours)
      * Implement GPS (4 hours)
      * Implement Balloon Barometer (4 hours)
    - Implement Closed Loop Remote Control **(35 hours)**
      * Learn to Use Remote API to Apply C Code (15 hours)
      * Use Remote API or Rewrite C Code to Lua (10 hours)
      * Apply Outputs of Functions to Individual Parts (10 hours)
    - Implement Autonomous Design **(30 hours)**
      * Feed Sensor Input to Functions (10 hours)
      * Use Remote API or Rewrite C Code to Lua (10 hours)
      * Take Outputs and Apply Them to Individual Components   
        (10 hours)
    - Group meetings **(25 hours)**
    - Subteam meetings **(10 hours)**
  + Dylan (126 hours) - 7:39
    - Add updated parts to CAD (4/2) **(14 hours)**
      * Voltage Regulator (2 hours)
      * Camera and transmitter (4 hours)
      * Magaero housing (8 hours)
    - Fabricate Prototype (4/26) **(50 hours)**
      * Set up sewing machine and 3D printers (2 hours)
      * Sew envelope (10 hours)
      * 3D print parts **(8 hours)**
        + Servo brackets & plates (4 hours)
        + Ultrasonic mount & plate (1 hour)
        + Motor mounts (1 hour)
        + Gondola and plate (2 hours)
      * Attach 3D printed parts to envelope (5 hours)
      * Inflation test of lift bag inside envelope with air (5 hours)
      * Attach servo and motor shafts to brackets (4 hours)
      * Add ultrasonics to bracket (1 hour)
      * Add electronics to gondola (5 hours)
      * Wire prototype (10 hours)
      * Second Inflation test of lift bag inside envelope with air (5 hours)
    - Implement Sensors to Read Pseudo Data from Vrep **(22 hours)**
      * Research Sensors (6 hours)
      * Implement Ultrasonic Sensor (4 hours)
      * Implement IMU (4 hours)
      * Implement Gps (4 hours)
      * Implement Balloon Barometer (4 hours)
    - Group meetings (25 hours)
    - Subteam meetings (10 hours)
  + George (140 hours) - 7:48
    - Complete path following terrain tracking PID design (10 hours)
    - Simulate Path following terrain tracking in Matlab (10 hours)
    - Define plant for closed loop RC (5 hours)
    - Pole placement and integral control added to RC design (15 hours)
    - Simulate RC response in Matlab (5 hours)
    - Design filters to obtain accurate state data (25-30 hours) will be Broken down when filter design chosen after further research
    - Simulate and test noisy sensor model (10 hours)
    - Auto landing function (10 hours)
    - Auto take off function (10 hours)
    - Meetings (35 hours)
  + Ryan (122 hours) - 7:57
    - Finalize BOM PCB parts (2 hours)
    - Wiring data bus between sensors to microcontroller in board design (3 hours)
    - Wiring voltage rails to all components (4 hours)
    - Wiring microprocessor to microcontroller, receiver and pinouts for servos and ESC (3 hours)
    - Verify PCB with power management (4 hours)
    - Send out PCB design to manufacturing (1 hour)
    - Remove ECE 121 repo within Barone2 repo and re-upload ECE121 C programming code to Barone2 repo (1 hour)
    - Program C libraries for Linear algebra, integration, and other functions needed for controls (16 hours)
    - Program C libraries RC response (16 hours)
    - Program C Libraries for autonomous (16 hours)
    - Program C libraries automated landing and takeoff (16 hours)
    - Group meetings (25 hours)
    - Sub-team meetings (15 hours)
  + Members who finish their tasks early should help with sensors/controls/simulation coding depending on current progress in those areas.

Meeting End: 8:10