CprE / EE 492 - Sdmay18-25

Bi-Weekly Report 4

Autonomous Health Monitoring of Civil Infrastructure using UAV

Start Date - End Date: Feb. 23 - Mar. 9

Faculty Advisor: Dr. Halil Ceylan

Team Members:

Nathan Conroy - Software Lead Kevin Yen - Hardware Lead Quade Spellman - Meeting Facilitator Isaac Bries - Test Engineer Molly Hayes - Meeting Scribe Rishab Sharma - Report Manager

Past Week Accomplishments

During these past weeks we have completed almost all our parts requirement to build a UAV for health monitoring of civil infrastructure. We have sent out the parts needed to be ordered by ETG, but we received a message that said some of the parts we wanted to order were being marked as fraudulent. This was due to the fact that the sellers were not from the States and thus cannot be 100% trusted. This is one of the many lessons we learnt as buying parts for drones is a hassle, especially with all the parts that we require. So to correct this problem, we found better potential sellers and have now sent all of our parts to be ordered.

We met with our client this week and discussed all these problems and decided as a group that we will use an olympus camera for now as our main HD camera. We also have to option of using our GoPro Hero 4, but we decided it w

ould be easier to proceed with the Olympus camera, because we will then be able to use any general gimbal.

Also, some of our important parts have arrived in ETG, in Coover. Our motors, drone propellers, power connectors, and the telemetry unit have arrived. We have the frame with us already and now are ready to start building.

We also decided as a group that Molly and Nathan will take the FAA certification test some time after spring break. Molly knows someone who has flown a drone and will contact him to help us with flying the drone.

Here is the list of all the parts that we have ordered so far this semester. This includes all the orders we have put in:

First Order						
				0.		Cost
Name	Description	Supplier	Units	Qty	Cost (each)	Total
Tarot T960	Frame	robotsho p.com	1	1	\$299	\$299
Tarot T810 T960 T1000 Multi-Rotor Foldable Landing Gear	Landing Gear	hobbykin g.com	1	1	\$68.40	\$68.40
Tarot T810 T960 Gimbal Mount Kit	Mounting Rail	hobbykin g.com	1	1	\$16.95	\$16.95
Here GNSS/GPS for Pixhawk 2.1	GPS	robotsho p.com	1	1	\$48.00	\$48.00
Pixhawk 2.1	Flight Controller	robotsho p.com	1	1	\$198	\$198
HKPilot Transceiver	3DR Radio Telementry	hobbykin g.com	1	1	\$32.67	\$32.67
FrSky Tranais Qx7	Radio Transmitter	hobbykin g.com	1	1	\$104.99	\$104.99
FrSky X8R	Radio Reciever	hobbykin g.com	1	1	\$36.80	\$36.80
Tiger Motor Flame 80A	Electronic Speed Controller	tmotor.c om	1	7	\$119.99	\$839.93
P80 Kv100	Motor	tmotor.c om	1	8	\$199.90	\$1,599.2 0
T-Motor G29x9.5	Propellers	tmotor.c om	2	4	\$270.90	\$1,083.6 0
Venom 13000mAh 22.2V	Battery	venompo wer.com	2	1	\$413	\$413
Venom Pro Touch Screen HD	Battery	venompo	1	1	\$239.99	\$239.99

45A RC	Charger	wer.com				
					Subtotal	\$4,981
		Second Or	der	1	1	1
Name	Description	Supplier	Units	Qty	Cost (each)	Cost Total
jD-RF900Plus Longrange	Long Range telementry	JDrones	1	1	\$259.95	\$259.95
Flir vue pro R, 30hz, 640x512, 13mm lens	Thermal Camrera	Flir	1	1	\$4,699.00	\$4,699.0 0
Tarot TL03FLIR	Thermal Gimbal	Alibaba	1	1	\$176.00	\$176.00
HS-200-HV 14S	Power Module	Craft&Th eory	1	1	\$27.00	\$27.00
4-14S HYB-BEC / 5.30V DF13-4P	Power Module BEC	Craft&Th eory	1	1	\$36.00	\$36.00
HS adapter cable for Pixhawk 2	Power Module cable	Craft&Th eory	1	1	\$5.00	\$5.00
Tarot 1755 Carbon Propellers	Motor Propellers	GetFPV	2	3	\$71.90	\$215.70
U7-V2.0 KV420	Motor	GetFPV	1	6	\$149.90	\$899.40
XT150 Charge lead w/6mm Gold Connectors	Connectors	MotionR C	1	1	\$4.06	\$4.06
					Subtotal	\$6,322.1 1
					Sum of Both Orders	\$11,303
					Cost of unusable parts	\$2,682.8 0

As the parts start coming in we will start building and are now also looking into software that will help us collect the necessary data for health monitoring of civil infrastructure. We are looking into arduino pilot as a starting point.

Pending Issues

All we have left to do, as we wait for our major parts to arrive, is to to study up for the FAA drone certification. For the FAA certification Molly and Nathan are using the study guide and practice exam given to us by our client to study for the certification exam. Sometime after spring break is when they will take the test.

Some of the parts have arrived and we can start attaching parts like attaching the motors, propellers, and batteries to the frame. This is just the start and as more parts come, they will be attached while we continue to also research for the software side.

Team Member	Contribution	Weekly Hours	Total Hours
Nathan Conroy	Set expectations of camera with client	3	90
Kevin Yen	Verified incoming parts were in good condition and also looked into drone assembly guides	3	71
Quade Spellman	Continued to search for a thermal gimbal that will work with our parts and that will ship to lowa State	6	56.5
Isaac Bries	Discussed camera expectations and requirements with client. Examined received parts to determine usability.	3	70
Molly Hayes	Finalized camera decision with client. Began studying for certification test.	3	48.5

Individual Contributions

Rishab Sharma	Had a meeting with client to discuss camera and goals for the upcoming months. Some parts came in, so we checked to make sure they were in proper condition	3	63
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Plans for Upcoming Week

- While we wait for the parts, we will continue our research on how to fly and use the sensors so once the parts come we will have an easier time setting it up.
 - How are we transferring video to the pilot? (drone image preview capabilities) streaming in HD?
 - What environments do you operate your drone in? For example have you ever tried light rain? How do you protect the drone?
 - What do you view your live video feed on? What device?
- Start building the drone, attaching sensors, and other parts as they come.
- Have set goals to try and finish building our drone by end of March and begin testing in the month of March or April
- Get scheduled for FAA drone certification sometime during end of March and beginning of April