sdmay19-35: Implementing a Web Portal System for Drone Simulation and Control

Biweekly Report 2

February 12th - February 26th

Client: Ali Jannesari

Faculty Advisor: Ali Jannesari

Team Members

Bansho — *Test Engineer. Sensors Hardware Developer.*

Ian — *Scrum Master. Full Stack Developer.*

Li — *Test Engineer. Back-end Developer.*

Jawad — *Meeting Manager. Embedded Systems Developer.*

Mehul — *Project Lead. Computer Vision Developer.*

Sammy — *Report Manager. Lead Front-end Developer.*

Summary of Progress this Report

- Created tests for our React app
    - Using the javascript test framework Jest
    - Testing basic functionality and ensuring the necessary components are being rendered in the UI
    - Added to the Dockerfile to ensure that the tests are ran as a part of the build process
        - Helps guarantee that the tests are ran before being pushed to the registry
- Developed scripts to make deploying new images to the server simple
    - Created a script that resides on the server to pull in new images, stop existing containers, and spin up new containers
    - Created a script that resides on the development machine to ssh into the server and trigger the script to pull the images and start them
- Connected the drone to the flight planner
    - Had to debug and try various methods to do this since the documentation provided by the drone company is outdated and sometimes unhelpful
    - Had to configure the drone's own wifi hotspot so that the drone and the computer controlling it are on the same uninterrupted network
- Set up the Joystick
    - Researched how to set up the joystick and set up all channels modes(1 - 6), for channel 5 set up three modes: forward position: STABILIZE (gives you direct control of the copter motors), middle position: ALT HOLD (the copter will control

the throttle and height, once you have set it), backward position: BRAKE. Also, set the channel 6 as Motor Emergency Stop mode.
    - adjusted correct values in the joystick.
- Computer-vision: World Generation
    - This project features the use of a library called WebODM which is an open source drone mapping library based on principles of computer vision.
    - We are using a lite version of WebODM called NodeODM to process images taken by the drone to stitch together a virtual environment inside the simulator. This environment is referred to as 'world' in Gazebo terminology.
- Made progress on integrating the Erle-Copter simulator with Gazebo
    - Worked around some defunct documentation on the Erle Robotics site to install MAVProxy on a testing VM
    - Documented workaround on the wiki

Pending Issues

- Continuous integration/deployment is not really set up, but I got us close to automation. Since our server is only accessible on the ISU network, we can't use it as a registry hook to trigger an update. Also, we have no runners on gitlab to set up CI.
- The ROS environment does not compile as many packages are outdated and others are updated, creating compatibility issues.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Bansho	Worked on drone machine with video feed with on ROS system.	23	99
Ian	Worked on integrating the Erle-Copter simulator. Installed MAVProxy.	23	98
Jawad	Connecting the drone to the flight planner and configured the ROS system	26	103
Li	Researched Joystick setting up and set all the modes and adjust the values, researching how to calibrate drone using flight planner	24	99
Mehul	Worked on interpreting the output file type of ODM and researched on the use of the file type to our project	24	99
Sammy	Created tests for React app and added to Dockerfile. Created deployment scripts.	26	110

Plans for Upcoming Reporting Period

- Begin working on integrating the various components into our web-application. This will require the other components to be in a state in which they are able to be integrated, even if they aren't fully functional.
- Configure the ROS system and calibrate the drone using APM.
- Improve the Throttle Control, and controls of Pitch (x-axis), Roll (y-axis), Yaw (rotation).