RED Delivery System

(Recovery and Deployment System)

**Team Members:**

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**Client**:

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**Milestone Project Matrix:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Task | Completion % | Andrea | Miguel | Marley | To do |
| Constant GPS data exchange | 80% | 40% | 0% | 40% | Send data over radios |
| Functional custom Pixhawk flight command | 100% | 33% | 33% | 33% | none |
| Phase representation with state machine | 100% | 50% | 25% | 25% | Insert hardware specific conditions for pressure sensors and cameras (accounted for in next milestone) |

**Client Meetings:**

Friday’s at 3:00 pm

**Discussion (Tasks):**

* **Constant GPS data exchange:** The GPS data has been collected from the GPS module attached to the Pixhawk via the DroneKit API. By connecting to the Pixhawk radio controller, we can access the GlobalLocation object in the flight script attached to the Raspberry Pi and collect the altitude, latitude, and longitude of the drone. Since we only have one GPS module and one drone that is available to us as of now, the GPS data that is relevant to the system is being constantly collected and packaged, but there has not been an exchange between the two UAV’s.
* **Create functional custom Pixhawk flight commands:** In order to demonstrate the ability of out program to execute a custom Pixhawk flight command via MavLink, we use a simple takeoff script for the drone to fly to an altitude of two meters, and when the target altitude is reached, the drone lands back to the ground.
* **Mission phase representation with state machine**: The state machine has been created based on the requirements of the project. Many of the conditions are subject to change, such as the proximity to the target and docking locations to constitute a change of machine state.

**Discussion (Contributions):**

* **Constant GPS data exchange:** Andrea and Marley were responsible for finding the GPS data and managing to collect and process it at a high speed. Miguel has done much research on how to use the radios to communicate the data between the Raspberry Pi’s, the exchange is not complete.
* **Create functional custom Pixhawk flight commands:** Miguel worked to find a safe first option for a custom command that would be a low risk of failure in a flight test. Andrea and Marley worked to create a script that ran a command for the drone to takeoff and fly to an altitude of two meters, loiter, and land when the target altitude has been reached.
* **Mission phase representation with state machine**: The state machine has been created. Andrea mapped out the requirements and implemented the events that constitutes a change of state for the system for each individual AUV. Marley and Miguel decided how to package messages that will be sent between the UAV’s to indicate current system state.

**Plan for the next milestone:**

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Andrea | Miguel | Marley |
| Autonomous deployment of the drone within certain GPS proximity of target GPS coordinate | PixHawk open source flight commands research and implementation | Testing | Implementation / Testing |
| Enhance Safety Capabilities | PixHawk open source flight commands research and implementation | Requirements gathering and ground station kill switch implementation | Implementation / Testing |

**Discussion (Milestone 3):**

* **Autonomous deployment of drone within certain GPS proximity of target GPS coordinate:** This will be achieved by entering a target location, where the UAV will then takeoff and reach within two meters of that target location and return home.
* **Enhancing Safety Capabilities:** In order to ensure the safety of the public and the UAV, the system shall include a “kill switch” that allows a manual takeover from the ground station as well as an automated contingency landing plan that will be executed if the system reaches a state of error. This will be achieved by creating a function that directs the UAV to slowly land on the ground when there is any sort of problem in the flight.

**Feedback from Faculty Sponsor on each task for the current Milestone:**

* **Constant GPS data exchange:**
* **Create functional custom Pixhawk flight commands:**
* **Mission phase representation with state machine**:

Faculty Sponsor Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_

**Feedback from Faculty Client on each task for the current Milestone:**

* **Constant GPS data exchange:**
* **Create functional custom Pixhawk flight commands:**
* **Mission phase representation with state machine**:

Client Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_