Software Requirements Specification (SRS) Document

Arka Aerospace - Web based GUI

Team Number: 18

Jahnavi Voruganti - 2021101046
Kunkulagunta Anupama - 2021101087
Mayank Goel - 2021113011
Radhikesh Agrawal - 2021113013

Brief problem statement:

Further development of a web-based GUI to interact with a drone. Designing a minimal and customised dashboard that can visualize flight data (trajectory, altitude) of drone(s) and other user-specific data. Deployment and integration with actual drone hardware.

System requirements:

Up-to-date Operating System and Web Browser

MQTT

OpenLayers

ReactJS

Bootstrap/Tailwind CSS

Users profile:

1. **Clients** - Assumed to have little to no knowledge of drone operation. Relatively competent in the operation of computers. Permissions to view certain data/execute specific commands will be restricted.
2. **Operator** - Assumed to have partial knowledge of operation of Ground Control Station. Has partial access to the features of the website.
3. **Administrator** - Well-versed in drone operation. Has complete access to all controls and available data.

Project Modules:

1. **User Management:**
   - **1.1. User login -R1:**
     - 1.1.1. Requires user email and password. Displays error message in case data is not found in the database.
     - 1.1.2. On successful login, the user is redirected to the dashboard. Else, prompted to login again/register.
   - **1.2. User Registration - R1:**
     - 1.2.1. Valid email address and password are required for registration. Users are classified into one of three user types (Client/Operator/Administrator).

2. **Frontend Development:**

   - **2.1. Design:**
     - 2.1.1. Make dashboard elements responsive **- R1**.
     - 2.1.2. Convert to a horizontal layout with a collapsible control panel **- R1**.
     - 2.1.3. Include a window for delivery creation **- R2**.
     - 2.1.4. Visualise the trajectory of the drone(s) on map **- R1**.
   - **2.2. User-specificity/Scalability - R2:**
     - 2.2.1. **Client:** Able to view the trajectory of only a single, specific drone.
     - 2.2.2. Has access to the delivery creation window to place an order.
     - 2.2.3. Receives information regarding payload (such as item description, size).
     - 2.2.4. **Operator:** Can view multiple drones simultaneously.
     - 2.2.5. Data regarding drone (such as battery health, speed), payload (such as size, weight) and client information (such as name, email) for specific orders is displayed.
     - 2.2.6. Receives alerts in case of emergency (such as low battery health of the drone).
     - 2.2.7. **Administrator:** Can view all drones in operation and their data..
     - 2.2.8. Administrator has access to command execution buttons (land, takeoff etc).

2.3. Deployment - R2:

2.3.1. Host completed website on AWS.

3. Backend Development:

3.1. Simulation - R1:

3.1.1. Simulate coordinates, trajectory on map for drones based on source and destination location.

3.1.2. Simulation of drone data such as health of the drone and its payload information.

3.2. Cloud Integration - R2:

3.2.1. Collect drone data via MAVLINK and push it to the cloud.

3.3. Hardware Integration - R2:

3.3.1. Upload mission to hardware.