Scenario 1

Novice Drone Pilot Nominal Interaction Scenario – Flight Visualization App Workflow

Charley Thorton was hired to fly a drone to collect data on points within the building that need to be inspected. Because Charley has never flown in this building, he was given a device that has this application.

Charley is currently looking at the “Upload View” tab to upload files or to use the default files. Charley clicked the default button, as he was instructed. Charley then clicks the “Analyze View” tab that switches the view to the 3D representation of the building and the flight paths.

After switching, a modal appears, reading “Does the scene look aligned?”. Charley notices that the paths and inspection points do not match the current building location in 3D space. Charley notices there is an option to translate and rotate the building until the space matches up with the data points. When the 3D space looks accurate.

Charley continues on, using their mouse and keyboard to “fly” throughout the 3D space. Charley notices that the view is a bit cluttered because all of the flight paths are shown by default. Charley decides to toggle several of the paths to make the view less cluttered by clicking each path’s name in the path visualizer widget pane.

During this time they are curious about one of the flight paths that was taken. Charley wants to know what direction the drone was flying during this path and clicks on this path which highlights it, displaying a directional arrow.

Charley wants to know how fast the drone was going and in what direction it was flying so they hover over the path at different points which populates the flight metadata viewer with the speed and pitch of the drone at that particular time.

At this time Charley is curious about any potential places where they might need to be more careful when flying the drone. They observe that certain places on the displayed path are red which indicates more time spent in that area. It is determined that those areas must be important.

Upon having navigated the 3D space and having viewed multiple potential flight paths, Charley feels confident in their ability to replicate such a drone inspection. Charley goes on to exit the web browser and close the application.

Scenario 2

Expert Drone Pilot and Novice Interaction Scenario – Flight Visualization App Workflow

James Clements is having a new roof put on the local sports arena he oversees. The construction team wants a drone pilot to take several images of the rafters to make sure they show no signs of failure under the weight of the roof. James normally would have his regular drone pilot take the photos, but he is out sick today. Instead, the construction manager recommends he shows Will Foster, a certified construction worker, how his drone pilot normally would fly through the site.

James knows the previous pilot had recorded his drone path and that he could show the path to Will. James opens the web app and uploads the current build site. He selects the "Analyze" tab to view the 3D model with its inspection points and paths. He moves around the 3D space briefly to confirm that it is the correct 3D site . James explains to Will a bit about the layout of the site and that he needs Will to take images of the rafters.

James then gives Will the keyboard and mouse so he can select a few flight paths from the previous pilot. Will uses the "Highlight" button to highlight Path 1 in the model and checks the "Visible" checkbox for every path. He uses the keyboard and mouse to control the drone and examine each path that appears in the space. He changes the highlighted path when he needs to see details for a specific path. Will notices that the inspection was always performed counterclockwise. Will asks James if he knows why this is, and James states that the air draft usually moves counterclockwise due to several fans placed around the arena. Will continues to explore the 3D space and is confident he is ready to fly the drone to take the photos.

Scenario 3 (Error Scenario)

Construction Worker Error Scenario

A building inspector will be inspecting an important site via drone in a few days and Will, a construction worker, has been asked by his manager to verify the inspection points via drone before it actually needs to be done. His manager has a .glb file for the construction site model, as well as a .txt file as a list of inspection points that the professional will be using. She also has a .txt file containing data for a recommended drone path. She uploads the files to the site for Will's use so that he does not need all the files.

Will opens the application and clicks the “Analyze View” tab that switches the view to the 3D representation of the building and the flight paths. He now sees a 3D model of the construction site with marked inspection points. He also sees a list of possible paths on the side of the screen.

He notices that in the "Flight Paths" sidebar, only one path can be highlighted at the top. By default, Path 1 is highlighted and he can see its details as well as the path itself highlighted in the 3D space. He notices that there are three other paths listed though, and he wants to take a turn highlighting each of them.

He sees that each path has something labeled "Highlight" and also sees a checkbox checked next to every path. He assumes that the X in the checkbox next to each path means that the path is not highlighted, so he tries clicking the X next to Path 2 and Path 3. It doesn't look like that changes anything though, so he looks for something else to click. He realizes that the Highlight label is actually a button, and when he clicks the Highlight button for Path 2, Path 2 becomes the highlighted path. However, although Path 2 is now highlighted, he notices that Path 3 is now missing from the 3D space, and he cannot figure out how to make it reappear.

He is finally able to fix his problem when he spies a label that reads "Visible" next to the checkbox he had clicked next to Path 3 before. He realizes that when he un-selected the checkbox before in an attempt to change the highlighted path, he accidentally turned off the path's visibility. When he selects the Visible checkbox next to Path 3 again, Path 3 appears once more in the 3D space.