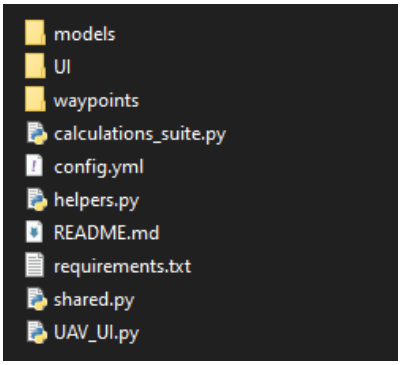
User Manual

- Starting the program and loading a model.
- View a waypoint and its data.
- Getting waypoint route information and flight estimate information.

Starting the program and loading a model.

1. Navigate to the project folder. This can be done either through Explorer or through the terminal.

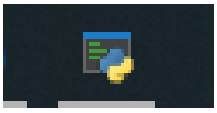
2. Ensure your current view looks like the following. The view would be the same if you are using the terminal. The file UAV_UI.py and the folders models and waypoints should be visible.



3. Here you have two options.
   Option 1: Double click the UAV_UI.py file to run the program.
   Option 2 (if you are in the terminal): Run the following command python UAV_UI.py

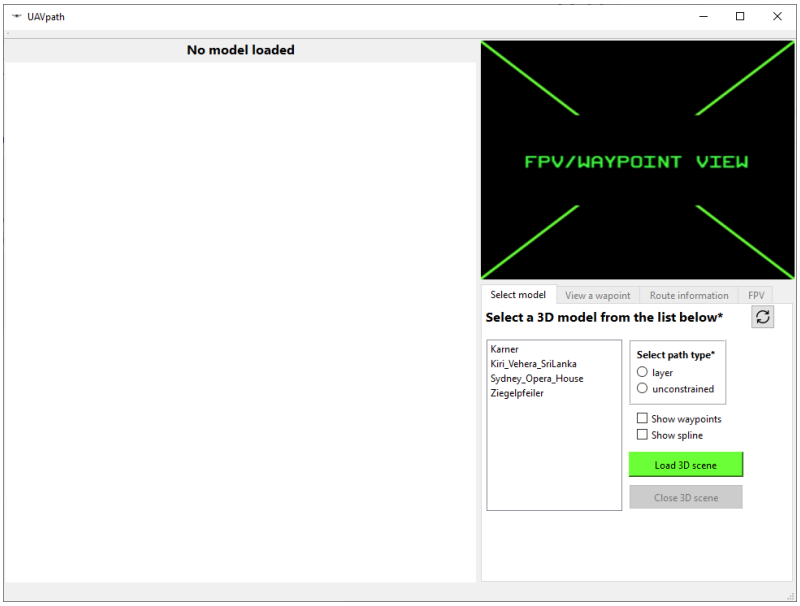
4. The following window should display after a few seconds.

If the window did not display, check your taskbar and click on the following icon.



5. Click on the button labeled “LOG ON” in the bottom right hand corner.

6. The following window should appear. In the bottom righthand corner we can see the control panel. In the control panel, we can see that there are tabs available for us to use in the bottom right corner namely “Select model”, “View a waypoint” and “Route information”. The tab named “Select model” will be considered our home tab. A model must first be loaded from this tab before the other tabs are enabled.

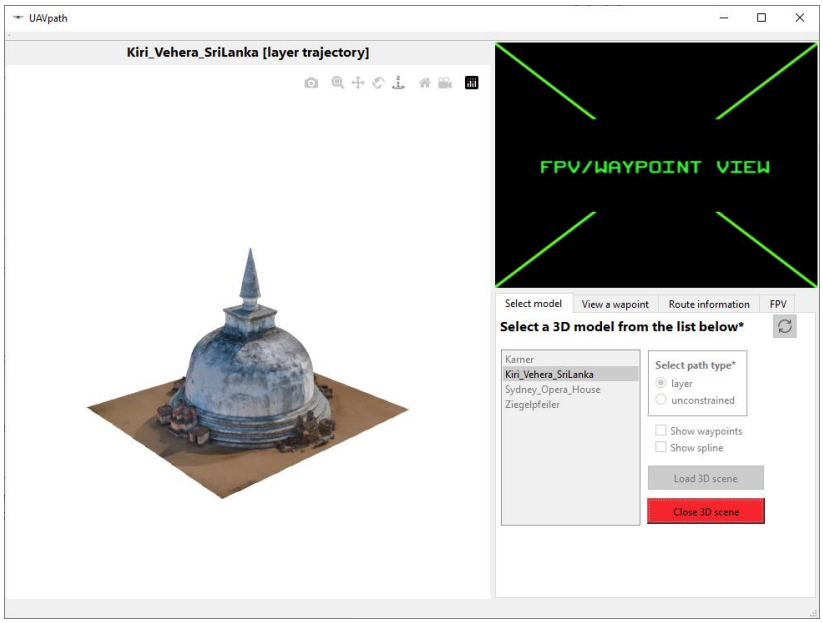


7. To load a model the user must complete BOTH the following.
   1. Select a model from the list menu on the left side of the control panel; AND
   2. Select a path type from the frame on the right of the list menu.

If only one of the above conditions is true, a dialog warning should appear that informs the user that the model loading requirements are not met. When loading a model, the user has the option to add waypoints and/or add a spline curve. These can be selected by the relevant checkboxes if desired but are not necessary. Finally, to load the model, click on the green button labeled “Load 3D scene”.

Note: Loading a model (and path trajectory) also loads the corresponding waypoints.

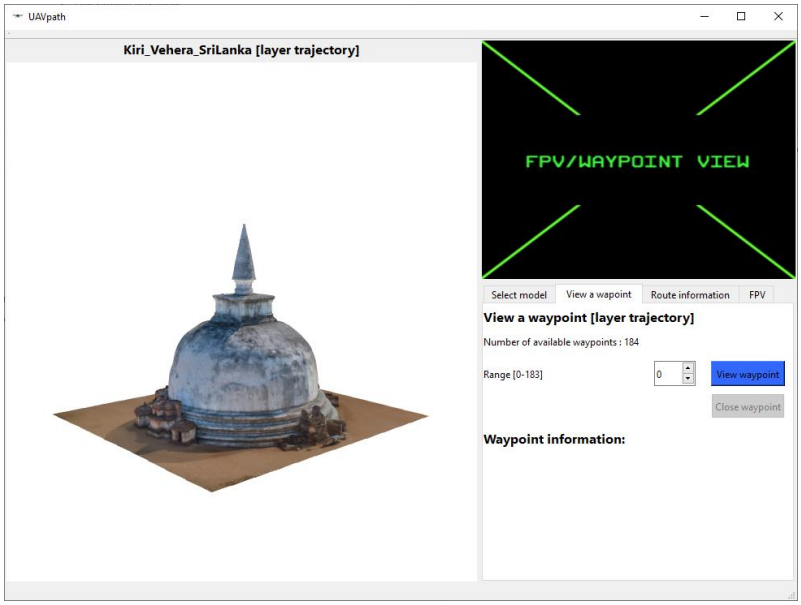
8. After successfully loading a model, the window should look like the following. Above the 3D rendering viewport, which contains the model, it should say the name of the currently loaded model and the trajectory that is being used for waypoints. A red button will also appear labeled “Close 3D scene”. You can use this button to close the currently open model to return to a state such as in step 7.



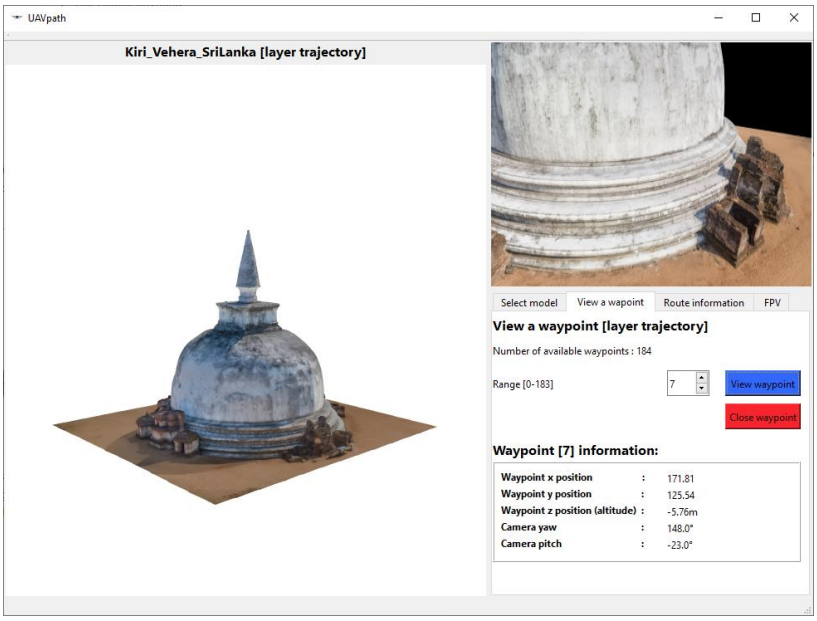
The other tabs in the control panel should now be enabled.

Viewing a waypoint.

1. To view individual waypoints, click on the “View a waypoint” tab in the control panel. The control panel should show the following screen in the bottom right hand corner.



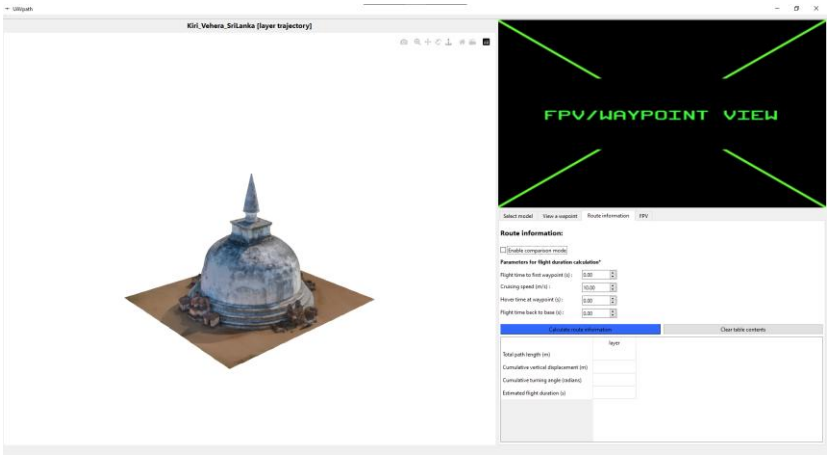
2. A range of waypoints is given; both start and end points included. An integer can be typed into the spinbox to select a specific waypoint number. The “View waypoint” button can then be clicked to view the waypoint in the window in the top right. For example, here we are viewing waypoint with index 7 in the model Kiri Vehera Sri Lanka.



3. The red “Close waypoint” button can be clicked if the user wants to return to the default view of the current (waypoint view) tab.

Getting waypoint route information and flight estimate information.

1. To view the information of the selected route, click on the “Route information” tab in the control panel. The control panel should show the following screen in the bottom right hand corner

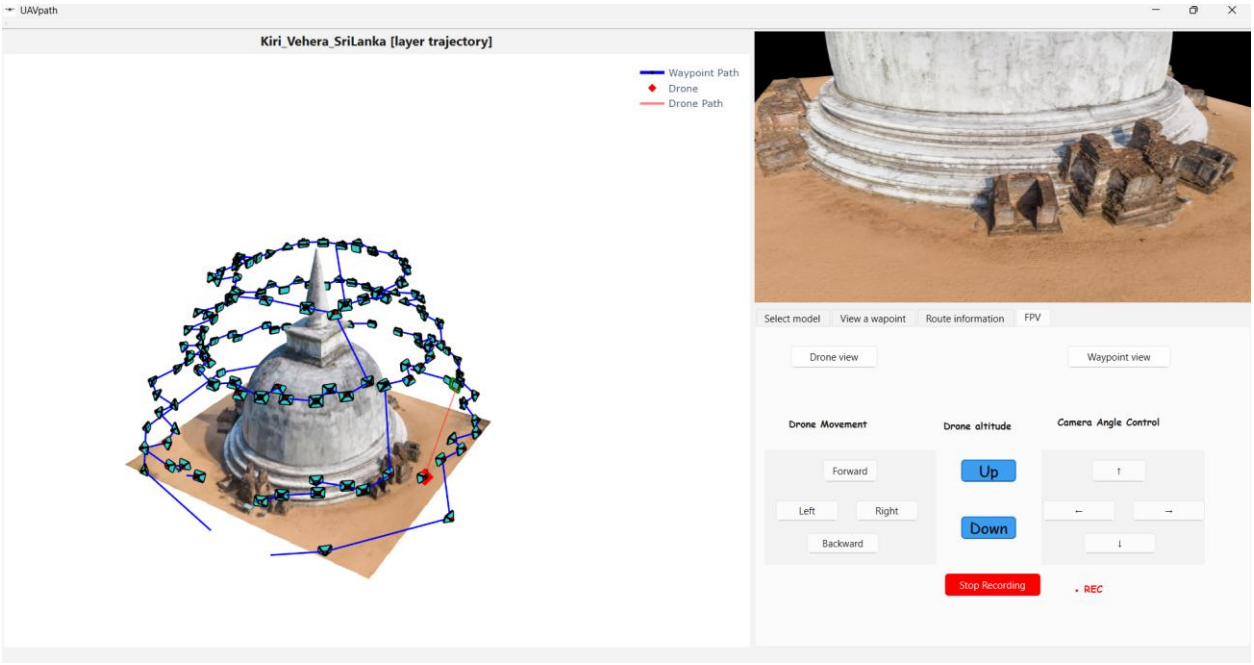


2. There are two buttons that will update the table below them. The blue button labeled “Calculate route information” will populate the table with valuable information about the currently selected path. The user can change the parameters for the flight time calculation to suit their needs. The button must be clicked every time to change the information in the table.

3. The checkbox labeled “Enable comparison mode” will enable the user to compare the currently selected path with other paths. The user can select the different paths and must then click on “Calculate route information” to show the different metrics.

4. To clear the table, the user can click on the “Clear table contents” button.

FPV tab



This tab allows for direct, manual control over the drone's position and camera orientation within the 3D model. You can also record your flight session from this panel.

View Selection

This section switches the content of the main FPV display panel in the top-right.

- Drone view: When selected, the FPV panel shows a live feed from the drone's virtual camera. This view will update in real-time as you use the movement, altitude, and camera controls.
- Waypoint view: This switches the FPV panel to show the static view from the waypoint currently selected in the "View a waypoint" tab. This is useful for comparing the drone's current view to a planned waypoint view.

Drone Movement

These controls move the drone's position within the 3D space. The drone moves relative to the direction it is currently facing.

- Forward: Moves the drone forward.
- Backward: Moves the drone backward.
- Left: Slides (strafes) the drone to its left without changing its heading.
- Right: Slides (strafes) the drone to its right without changing its heading.

Drone altitude

These controls adjust the drone's height.

- Up: Increases the drone's altitude, making it fly higher.
- Down: Decreases the drone's altitude, making it fly lower.

Camera Angle Control

These controls adjust the direction the drone's camera is pointing without moving the drone itself.

- (Turn Left / Right Buttons): The two buttons in the middle row rotate (yaw) the drone on the spot. This changes the direction it is facing.
- (Tilt Up / Down Buttons - ↑ / ↓): The two buttons in the last row tilt the camera's angle up or down (pitch) without changing the drone's position or heading.

Session Recording

This section allows you to record the live FPV feed to a video file.

- Start / Stop Recording Button: This is a toggle button.
    - In its initial state, it will say "Start Recording". Clicking it begins the recording session.
    - Once recording starts, the button turns red and the text changes to "Stop Recording", as shown in your image.
    - Clicking "Stop Recording" will end the recording and prompt you with a "Save As" dialog box to save the flight session as an MP4 video file to your computer.

● REC Label: This red text label appears next to the button to provide a clear visual indicator that a recording is currently in progress. It disappears when you stop recording