GUI (Graphical User Interface):

Graphical user interface

Description automatically generated

The front-end of the GUI is designed using App Designer in Matlab

1. The window contains graphs that presents the real-time data received from MPU6050.

* These three graphs at the left of the window are
* Angle graph: to demonstrate the instant angle of the CubeSat.
* Velocity graph: to demonstrate the current angular velocity of the CubeSat.
* Control pulses graph: to show the control pulses to the DC motor received from Arduino.
* The 3D graph at the right of the window contains 3D model of CubeSat to simulate the instant movement of the actual CubeSat. The simulation is embedded into the GUI using Sensor Fusion and Tracking Toolbox in Matlab.

1. Search for devices button to search for the available Bluetooth devices and show them in Table as shown in figure below.

Text

Description automatically generated with low confidence

1. Connect button is activated after selection of the address of the Bluetooth module used in the CubeSat.
2. Control mode button: when pressed, two control modes (Angle & Velocity) are shown and Tunning of the parameters of PID controller. The user inputs the values of the desired angle or velocity in the assigned textbox. Similarly, the tuning parameters of PID (Kp, Kd, and Ki) are assigned by the user.

Graphical user interface, website

Description automatically generated