GPS Failure Failsafe Implementation and Simulation for Quadrotor

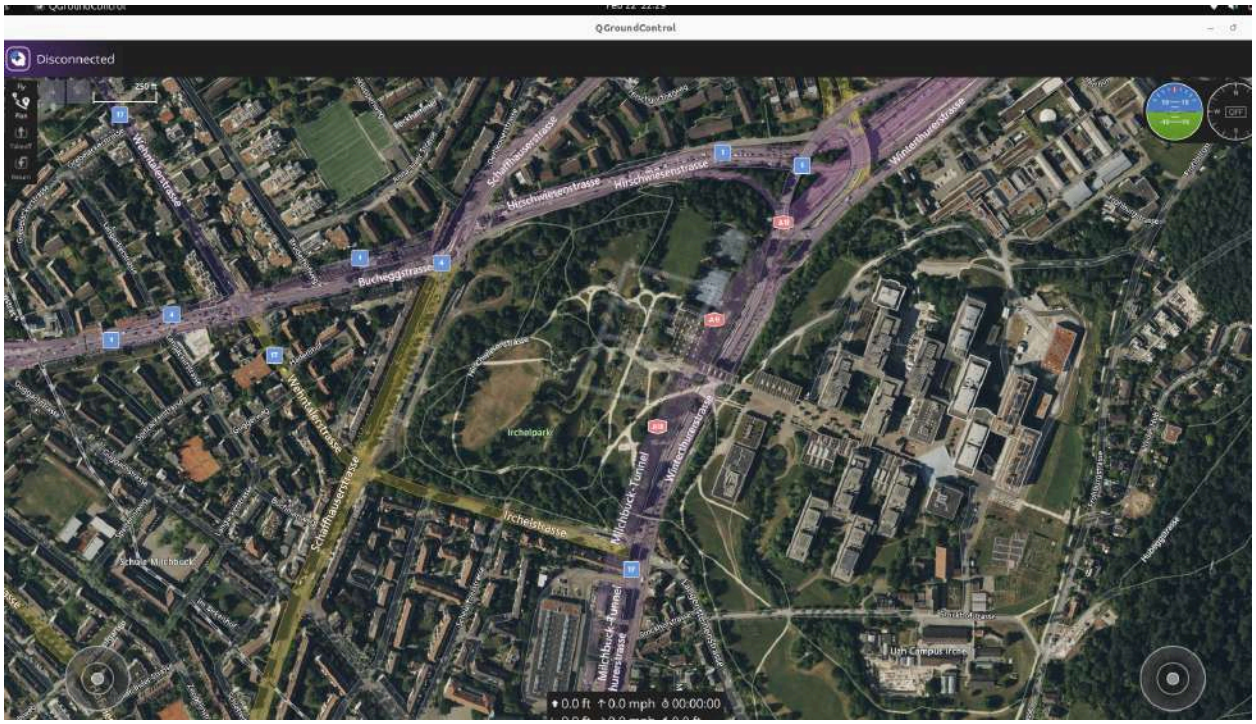
Week 2: Simulation Execution and Initial Tests

Step 1: Launch QGroundControl

Open a terminal and enter the following command:

./QGroundControl.AppImage

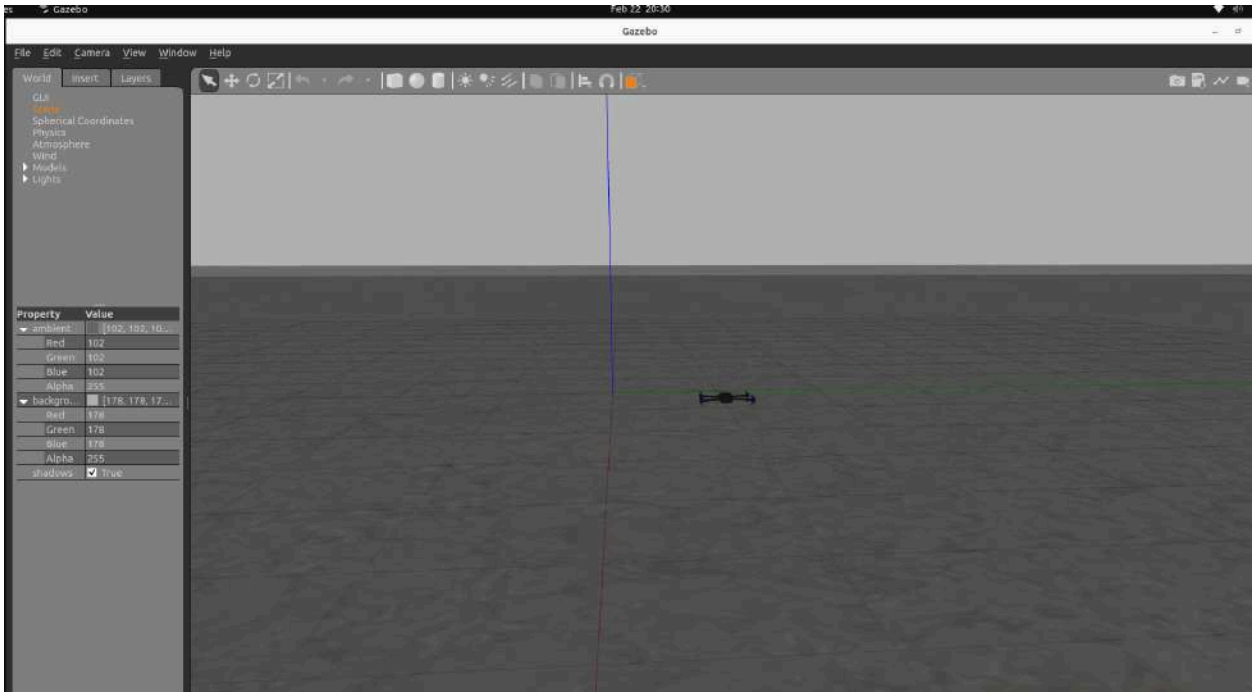
This will launch the QGroundControl GUI.



Step 2: Launch the PX4 Drone in Gazebo

Open a terminal and enter:

cd ~/px4-Autopilot
make px4_sitl gazebo



After running these commands, the Gazebo GUI will appear.

Go to the terminal where Gazebo launched :

Enter the command to make the drone stay at a position after a GPS failure :

param set COM_POSCTL_NAVL 0

param save

Shutdown

And restart the gazebo by using the above commands now make the gps failsafe

Step 3: Take the Drone

You can take off the drone using one of the following methods:

1. **Using QGroundControl:**
    - Use the available options in the QGroundControl GUI to launch the drone.

    OR

2. **By using the Terminal:**

Return to the terminal where you launched the PX4 drone and enter:
commander takeoff

- This command will make the drone take off and start flying.

Step 4: Set a Target Location

Once the drone takes off, assign a location to reach.

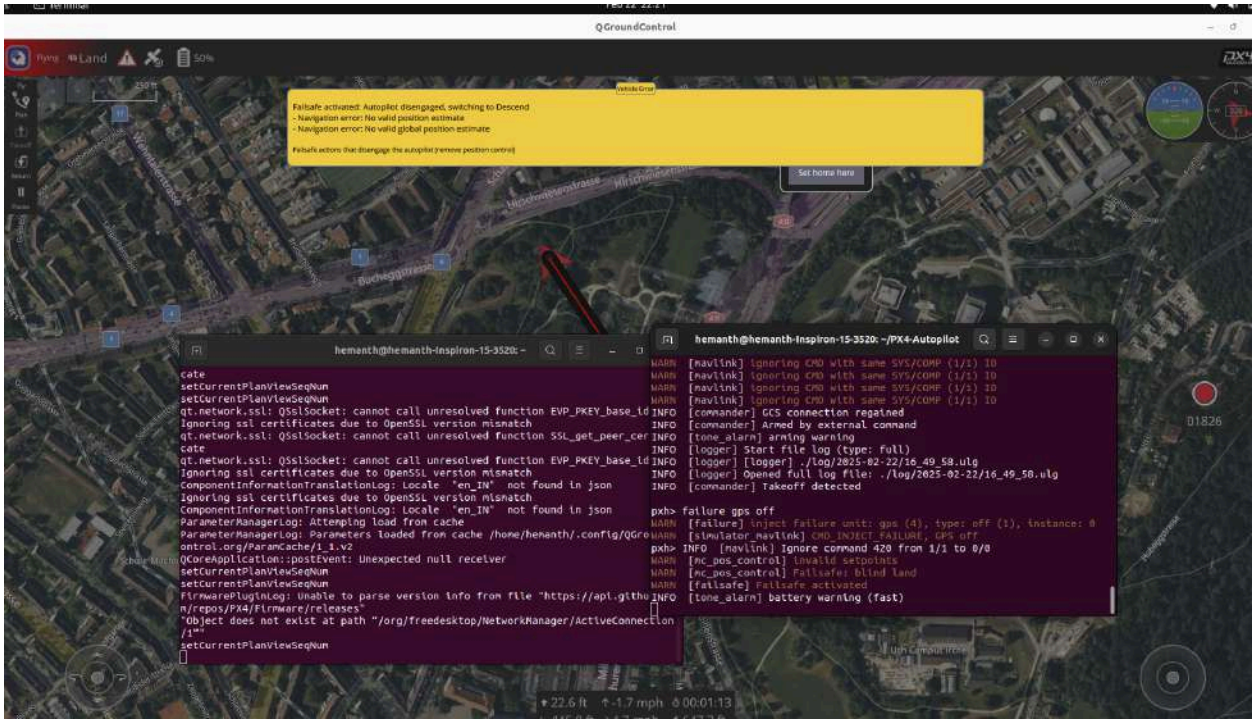
Step 5: Inducing GPS Failure

To simulate a GPS failsafe:

1. Open the **MAVLink Console** in QGroundControl:
   - Navigate to **Analyze Tools > MAVLink Console**.

Enter the following command to disable GPS:
failure gps off

2.
   - This will cause GPS failure, and a corresponding message will be displayed.



Step 6: Restoring GPS Functionality

After a few seconds, enter the following command to restore GPS:

failure gps ok

This will stabilize the drone or allow it to continue to its destination.

After that, download the log files :

Analyze tools > logdownload > choose log file

Convert into a CSV file by using commands

Open the terminal :

Navigate to the folder where the ulog file is located:

Enter the command :

Ulog2csv file_path