

Initial Setup

This project aims to design and simulate a failsafe GPS failure for a quadrotor employing PX4 SITL (Software-In-The-Loop) with Gazebo. It entails setting up the PX4 environment, source-building PX4, performing simulations, and viewing the quadrotor's behavior in a GPS failure simulation scenario. Learners will adhere to official PX4 tutorials and instructions to achieve a hands-on grasp of autonomous system simulation and failsafe concepts.

Steps and Tasks:

1. Setup and Installation:

- **Install ROS and Gazebo:**

- Install ROS 2

```
sudo apt update
```

```
sudo apt install ros-humble-desktop
```

Install the compatible version of Gazebo.

```
sudo apt install gazebo11 libgazebo11-dev
```

- **Install MAVLink:**

- Install MAVLink libraries to facilitate communication between PX4 and Gazebo.

```
sudo apt install python3-pip
```

```
pip3 install pymavlink mavproxy
```

- **Build PX4 from Source:**

- Clone the PX4 repository from GitHub.

```
git clone https://github.com/PX4/PX4-Autopilot.git cd  
PX4-Autopilot
```

```
git submodule update --init --recursive
```

- Run the build command: `make px4_sitl gazebo` to set up the Gazebo simulation environment.

make px4_sitl gazebo

- **Install QGroundControl (QGC):**

- Download the latest Applmage from the official site.

wget

<https://d176td9ibo4jno.cloudfront.net/latest/QGroundControl.Applmage>

chmod +x QGroundControl.Applmage

- And then launch the qgroundcontrol

./QGroundControl.Applmage