Installation

ROS

You can find these installation instructions here.

Setup your sources.list

```
sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
```

Set up your keys

```
sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
```

Update packages and install ROS

```
sudo apt update
sudo apt install ros-melodic-desktop-full
```

Setup the environment

```
echo "source /opt/ros/melodic/setup.bash" >> ~/.bashrc
source ~/.bashrc
```

Dependencies

```
sudo apt install python-rosdep python-rosinstall python-rosinstall-generator python-wstool build-essential
```

Rosdep

```
sudo apt install python-rosdep
sudo rosdep init
rosdep update
```

Set Up Catkin workspace

We use `catkin build` instead of `catkin_make`. Please install the following:

```
sudo apt-get install python-wstool python-rosinstall-generator python-catkin-tools
```

Then, initialize the catkin workspace:

```
mkdir -p ~/catkin_ws/src
cd ~/catkin_ws
catkin init
```

Dependencies installation

Install `mavros` and `mavlink` from source:

```
cd ~/catkin_ws
wstool init ~/catkin_ws/src

rosinstall_generator --upstream mavros | tee /tmp/mavros.rosinstall
rosinstall_generator mavlink | tee -a /tmp/mavros.rosinstall
wstool merge -t src /tmp/mavros.rosinstall
wstool update -t src
rosdep install --from-paths src --ignore-src --rosdistro `echo $ROS_DISTRO` -y

catkin build
```

Add a line to end of `~/.bashrc` by running the following command:

```
echo "source ~/catkin_ws/devel/setup.bash" >> ~/.bashrc
```

update global variables

```
source ~/.bashrc
```

install geographiclib dependancy

```
sudo ~/catkin_ws/src/mavros/mavros/scripts/install_geographiclib_datasets.sh
```

Ardupilot

Installing Ardupilot and MAVProxy

Clone ArduPilot

In home directory:

```
cd ~
sudo apt install git
git clone https://github.com/ArduPilot/ardupilot.git
cd ardupilot
git checkout Copter-3.6
git submodule update --init --recursive
```

Install dependencies:

```
sudo apt install python-matplotlib python-serial python-wxgtk3.0 python-wxtools python-lxml python-scipy python-opencv ccache gawk p
```

Use pip (Python package installer) to install mavproxy:

```
sudo pip install future pymavlink MAVProxy
```

Open `~/.bashrc` for editing:

```
gedit ~/.bashrc
```

Add these lines to end of `~/.bashrc` (the file open in the text editor):

```
export PATH=$PATH:$HOME/ardupilot/Tools/autotest
export PATH=/usr/lib/ccache:$PATH
```

Save and close the text editor.

Reload `~/.bashrc`:

```
. ~/.bashrc
```

Run SITL (Software In The Loop) once to set params:

```
cd ~/ardupilot/ArduCopter
sim_vehicle.py -w
```

Gazebo and Plugins

Gazebo

Setup your computer to accept software from http://packages.osrfoundation.org:

```
sudo sh -c 'echo "deb http://packages.osrfoundation.org/gazebo/ubuntu-stable `lsb_release -cs` main" > /etc/apt/sources.list.d/gazeb
```

Setup keys:

```
wget http://packages.osrfoundation.org/gazebo.key -O - | sudo apt-key add -
```

Reload software list:

```
sudo apt update
```

Install Gazebo:

```
sudo apt install gazebo9 libgazebo9-dev
```

Install Gazebo plugin for APM (ArduPilot Master) :

```
cd ~
git clone https://github.com/khancyr/ardupilot_gazebo.git
cd ardupilot_gazebo
git checkout dev
```

build and install plugin

```
mkdir build
cd build
cmake ..
make -j4
sudo make install
```

```
echo 'source /usr/share/gazebo/setup.sh' >> ~/.bashrc
```

Set paths for models:

```
echo 'export GAZEBO_MODEL_PATH=~/ardupilot_gazebo/models' >> ~/.bashrc
. ~/.bashrc
```

Run Simulator

In one Terminal (Terminal 1), run Gazebo:

```
gazebo --verbose ~/ardupilot_gazebo/worlds/iris_arducopter_runway.world
```

In another Terminal (Terminal 2), run SITL:

```
cd ~/ardupilot/ArduCopter/
sim_vehicle.py -v ArduCopter -f gazebo-iris --console
```

After Installing everything you need to download the package from the given drive link and paste it in the `~/catkin_ws/src` folder.

Copy the models from the `~/catkin_ws/src/interiit21/models` folder and paste them in your `~/.gazebo/models` folder.

To start everything required for simulation run

```
source ~/catkin_ws/src/start_sim.sh
```