Setup the Navio2

- Follow this link to setup the navio2 hardware
  https://docs.emlid.com/navio2/ardupilot/hardware-setup/

Setting up Raspberry Pi 3b

- Flash memory card with preconfigured image from navio2 website
- Follow the steps from navio 2 website to configure the image for an ardurover
  https://docs.emlid.com/navio2/common/ardupilot/configuring-raspberry-pi/

Setting up the Ground Control Station

- Mission Planner (only for Windows)
  http://ardupilot.org/planner/docs/common-install-mission-planner.html

Configuring Autopilot using mission planner

- Follow the link below to setup rover (Skid steering configuration)
  http://ardupilot.org/rover/index.html

Connecting to RPI using SSH

- Connect phone to same network as raspberry is configured to connect. Use android application "Fing" to find IP address of navio 2, also we can use nmap utility.
- Using windows application "Putty" SSH using the ip obtained in above step.
- Follow navio2 docs to configure the autopilot https://docs.emlid.com/navio2/ardupilot/
- If using configured image network credentials should be
  Username : hartznetwork
  Password : sunnyday

Setting up Live Video Feed Service

- Setup motion on a web server
  https://pimylifeup.com/raspberry-pi-webcam-server/

- If unable to access video (gray screen is observed)
  Refer the below discussion and try the command ***"sudo modprobe bcm2835-v4l2"*** to rectify the situation.
  https://raspberrypi.stackexchange.com/questions/60669/unable-to-open-video-device

Setting up Flask Server and IoT platform (Example)

- The below link offers the basic instruction for setting up an ioT platform using Flask http://www.instructables.com/id/From-Data-to-Graph-a-Web-Jorney-With-Flask-and-SQL/

Setting up Remote Page (Example)

- Use below link to control understand controlling rover from web interface https://circuitdigest.com/microcontroller-projects/web-controlled-raspberry-pi-surveillance-robot

Understanding tracking on web interface (Example)

- Use below link to get a gist of google maps apis can be used http://www.instructables.com/id/Raspberry-Pi-Location-Tracker/

Understanding programming for web interface (Reference)

- HTML crash course for absolute beginners https://www.youtube.com/watch?v=UB1O30fR-EE

- CSS crash course for absolute beginners https://www.youtube.com/watch?v=yfoY53QXEnI

- Javascript for absolute beginners https://www.youtube.com/watch?v=vEROU2XtPR8&list=PLillGF-RfqbbnEGy3ROiLWk7JMCuSyQtX

This Project uses python 2 for its operation kindly ensure you install dependencies for python 2 only.

Note :

- Tunneling local server to the internet can be done to remove restriction of LAN
- Can be done using Pagekite or Ngrok

Reference Links used to add various features on the web interface

- **UI Tab feature** https://codepen.io/samarkandiy/pen/AiGjs

- **Flask Buttons**
  http://www.instructables.com/id/Python-WebServer-With-Flask-and-Raspberry-Pi/

- **Flask Database**
  http://www.instructables.com/id/From-Data-to-Graph-a-Web-Jorney-With-Flask-and-SQL/

- **Graphs using Python and sqlite**
  https://www.fontenay-ronan.fr/dynamic-charts-with-highcharts-sqlite-and-python/

- **Multiple Tabs**
  https://codepen.io/samarkandiy/pen/AiGjs

- **Side by Side divisions**
  https://jsfiddle.net/c6242/1/

- **Data display**
  http://www.instructables.com/id/From-Data-to-Graph-a-Web-Jorney-With-Flask-and-SQ/

- **Image Gallery**
  https://www.w3schools.com/css/tryit.asp?filename=trycss_image_gallery

- **Button**
  https://www.w3schools.com/css/css3_buttons.asp

- **Flask error**
  https://stackoverflow.com/questions/31252791/flask-importerror-no-module-named-flask

- **Maps**
  https://developers.google.com/maps/documentation/javascript/adding-a-google-map

- **Asynchronous update location**
  https://www.shanelynn.ie/asynchronous-updates-to-a-webpage-with-flask-and-socket-io/
  https://blog.miguelgrinberg.com/post/easy-websockets-with-flask-and-gevent

- **Installing socket libraries for python**
  Pip install flask-socketio
  pip uninstall python-socketio

pip install python-socketio
Pip install eventlet

- **If conflict arises between sqlite and socket go to below link**
  https://stackoverflow.com/questions/393554/python-sqlite3-and-concurrency

Navio 2 Reference Links

Emlid Documentation

- Flashing card and network configuration
  https://docs.emlid.com/navio2/common/ardupilot/configuring-raspberry-pi/

Autopilot tutorial

- https://docs.emlid.com/navio2/common/ardupilot/installation-and-running/

Github examples

- https://github.com/emlid/Navio2

ROS

- http://wiki.ros.org/Robots/Navio2

Tutorials for navio2 other than Emlid docs

Trello
https://trello.com/c/reCjd6Ls/90-mavros-navio2-tutorial

Instructable
http://www.instructables.com/id/Getting-Started-With-NavioNavio2/

Hackaday
https://hackaday.io/project/16352/instructions

DC motor control
https://community.emlid.com/t/how-to-control-a-dc-motor/353/4

Mavlink bridge
http://ardupilot.org/dev/docs/making-a-mavlink-wifi-bridge-using-the-raspberry-pi.html

ROS & Gazebo
http://gazebosim.org/tutorials?tut=ros_gzplugins#DifferentialDrive

ADC
https://community.emlid.com/t/read-adc-and-gpio17-18-into-python-script-while-apm-running/6341