

Study of Open-Source UAV Autopilot Softwares

OVERVIEW

To select the UAV autopilot software, we need to understand the features like vehicle monitoring analytics including altitude, speed, battery life, etc. provided by the softwares. Also, we need to consider some parameters that need to fulfill our requirements.

UAV Autopilot Softwares

Paparazzi UAV

Paparazzi GPLv2 licensed project consists of both an autopilot system as well as ground station mission planning and monitoring software. This was designed primarily to focus on autonomous flight and manual flying as secondary. It has features like a dynamic flight plan system which helps to easily create very complex automated missions.

ArduPilot UAV

ArduPilot is licensed under GPLv3, suits consist of navigation and ground station controlling software. This is advanced, full-featured, and reliable. It has features like advanced data-logging, analysis and simulation tools. It supports a wide variety of third-party sensors, computers, and communication systems.

Dronecode (PX4 autopilot)

Dronecode is a UAV development project. This includes the PX4 Autopilot flight control system, MAVlink communication toolkit, and QGroundControl user interface for flight control, mission planning, and configuration.

iNAV

iNAV is taken from the Cleanflight used to design GPS and Navigation features for multirotor and airplane models. iNAV supports Return-To-Home with a predefined climb height, position hold, waypoints, and follow-me features. F4 and F7 flight control boards are mostly used.

LibrePilot

LibrePilot licensed under GPLv3, this software is designed to control multi-copters and radio-controlled drones.

BetaFlight

BetaFlight is GPLv3 licensed, which focuses on flight performance. Leading-edge feature additions and wide target support. It has wide hardware support.

EmuFlight

EmuFlight is the same as BetaFlight, which is used for innovative filtering, and leading-edge features. It supports a wide range of hardware.

Tools for ArduPilot

DroneKit

DroneKit python library uses a connected vehicle from a python script, which API communicates over the MAVLink. It provides programmatic access to vehicle control.

Mission Planner

Mission Planner interfaces with Autopilot software. It provides point and click waypoints, using Google map, also to download the mission log files and analyze them.

APM Planner2

APM Planner2 is a ground station application for MAVLink based autopilots that help to plan a mission with GPS waypoints.

QGroundControl

QGroundControl used for vehicle control and mission planning with MAVLink protocol. It also supports multiple vehicle controls.

MAVProxy

MAVProxy command-line-based ground control station software. It has a feature to forward the message from UAV to multiple other ground stations and other devices over the network through UDP.

CONCLUSION

ArduPilot is overall best in all, which is more mature, which means more development is happening on this. It supports a wide variety of hardwares and can interface with many software tools. It has good performance results for UAVs. And it is mostly used for professional works.