Self-Driven UAV

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Abstract

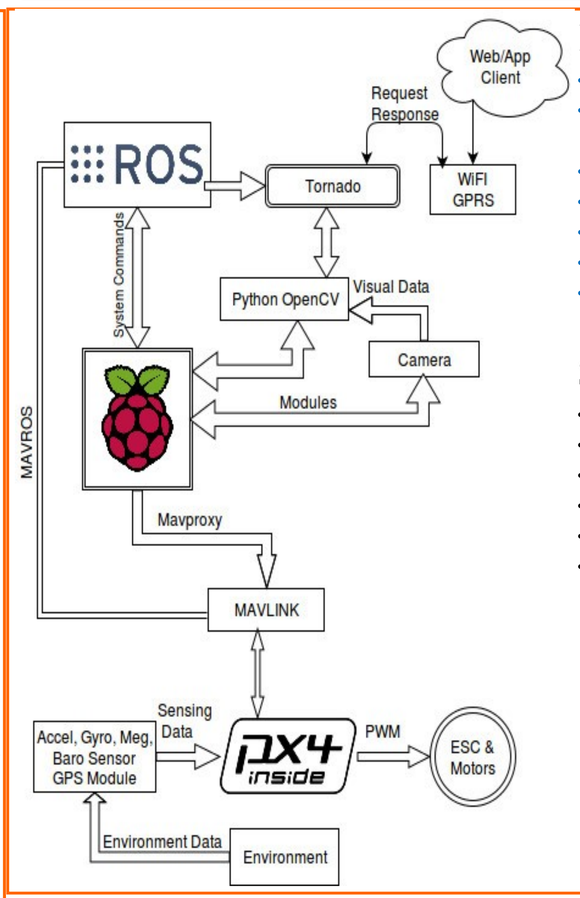
Self– Driven UAV (Unmanned Aerial Vehicle) is Intelligent concept in which drone can take intelligent decision on its own. Self-Driven idea is mainly focus on Object follow and Path follow. **Drone can follow specified object and also follow specified route autonomously.** User can watch **real time live streaming** coming from drone camera in application. **For specific tour one can use an android smartphone to control drone by using our application.**

For **Path follow**, User can specify path in application using map then drone will start following that path autonomously. It can record path for further flights.
For **Object Follow**, User can select object from streaming coming in application then drone will move according to Object movement. **Overall drone applications are divided in surveillance, controlling and monitoring sector.**

Introduction

- In present, every drone require at least one person requires to control drone. so it demands more manpower. Also currently drone doesn't possesses more intelligence.
- **Self-Driven UAV is to reduce manpower by providing more automation in controlling drone such that it requires less human interaction.** Also, We want to reduce cost. For that we have developed project in 2 phases. First, Assembly of drone & Second, application development on top of drone hardware.
- Goal is to design cost effective model for drone and provide intelligence to drone. **Basically, our drone is fully controlled by android app.**
- Major Drone hardware includes Raspberry pi, Flight controller, GPS module, Pi Camera, Li-Po Battery, Power distributor, Motors, Propellers **By using these hardware our purpose is high computation power with low cost.**
- We solved above specified problems by building Self-Driven UAV. Our drone provides 4 basic functionality : **Live streaming, Object follow, Path follow, Head count.**
- **Live streaming** application streams real time video from drone camera to application. This application will outperforms all remote controlled drones.
- In **Object Follow**, User can select object from streaming coming in application then drone will move according to Object movement.
- For **Path follow**, User can specify path in application using map then drone will start following that path autonomously. It can record path for further flights.

Hardware & Software



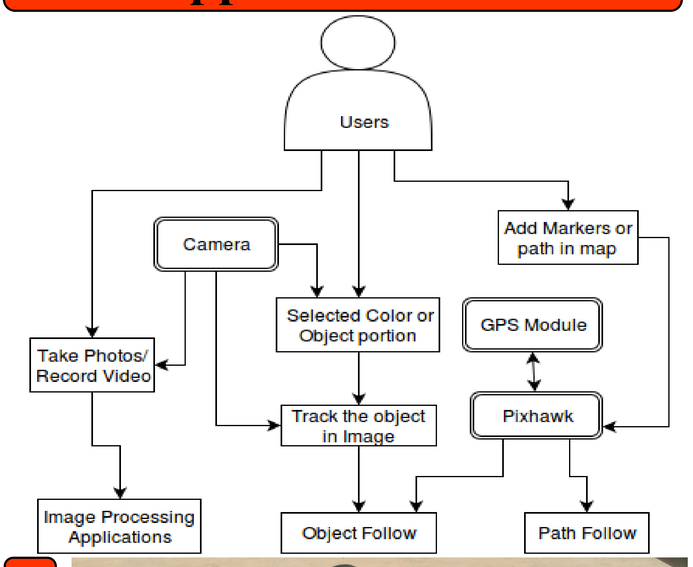
Hardwares :

- Raspberry pi,
- Pixhawk autopilot,
- ESC & Motor
- Power distributor
- Camera
- GPS module
- Li-Po Battery

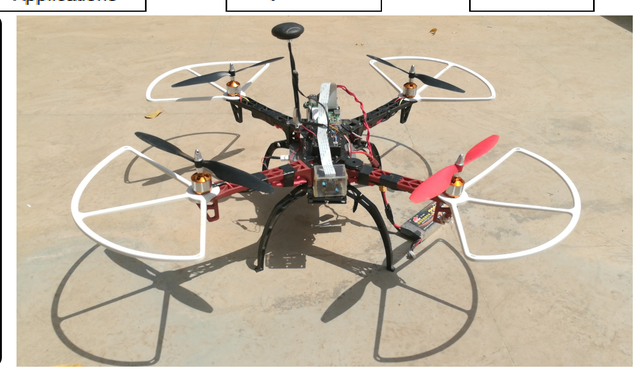
S/W & Technologies :

- ROS (Robot Operating System)
- OpenCV
- Python
- Android
- Tornado Web Server
- QGroundControl

Application Flow

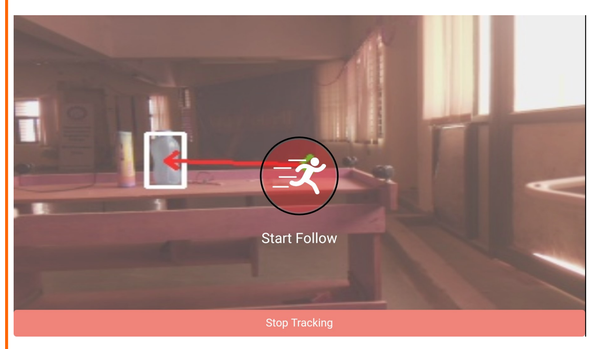


SNAPSHOT



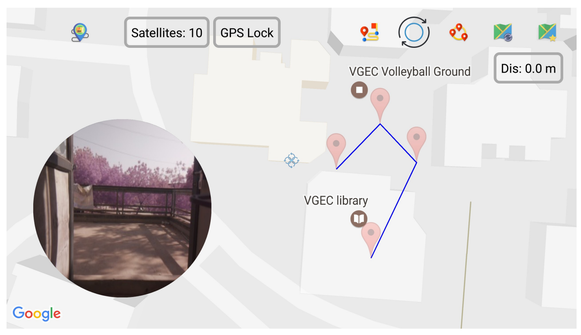
Results

Live-Streaming Application



Object Detection and Follow

Path Follow



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Comparison

Criteria	Commercial Drones	DroneX
Controlled by	By only Remote control	By Android app
Coverage Area	Limited by remote control coverage	Limited by GPRS coverage
Cost (INR)	Above 1 Lac	45000/-

Future Enhancements

1. Fully Autonomous drone
2. Goods delivery (Pick & drop)
3. Head Count
4. Air pollution monitoring
5. 3D Modelling of Environment

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