DRONE RANGER

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Abstract : The main aim of this work is to build a best UAV which is cost effective compare to all other drones. The major purpose of this UAV is used for surveillance in rural areas. This camera will provide live streaming to the required output device (i.e.) laptop or mobile. The live video streaming will have low throughputs and loss of information. In this, the system it consist of gps technology also. Through this gps the system provides output in the particular device. The prototype will also act as a delivery drone providing medical emergency kits in a hectic traffic area. This system is so helpful that in particular emergency it can provide first aid kit. It is totally controlled through the radio frequency. The prototype can flee in any directions in a very higher speed. Thus the work consist of Raspberry pi which is implemented to do any work were a low-end computer can process.

I. Introduction

In the present situation drones can be used in many commercial applications. Multi Rotor drones are the most common types of drones which are used by professionals and hobbyists alike. They are used for most common applications like aerial picturisation, aerial video surveillance, delivery system etc. Drones are now also used in a wide range of civilian roles ranging from search and rescue, surveillance, traffic monitoring, weather monitoring and firefighting, to personal drones and business drone-based picturisation , as well as videography, agriculture and even delivery services. One specific type of drone is becoming increasingly more popular lately: the delivery quad copter. A delivery drone is an autonomous vehicle, used to transport packages, food or for example medical goods in a very

tedious period of time. At times, the system can also protect border areas for any trespassing.

II. Existing system

This paper discus about the design and implementation of a Quad copter based UAV system for the delivery operations and surveillance operations using a camera. The system consists of separate camera for the surveillance and also it will have separate gps module for navigation. It also consists of APM 2.5 flight controller which is an old version in it. It's system battery is not much consistent for a longer period of time.

III. Proposed System

The systems we have proposed consist of two major units which is the hardware system and the other is through which the hardware is controlled using the remote. The hardware system consists of the frame attached to the brushless motors.

These motors are controlled using electronic speed controller. An additional mini-size computer is set up (i.e.) Raspberry Pi. This raspberry pi will confine both GPS and pi camera. In this work, the camera is used for surveillance and also for verifies the crowd control. The gps in the work will be helpful for navigation purposes. This camera will provide live streaming to the required output device (i.e.) laptop or mobile. As the same follows for the GPS module.

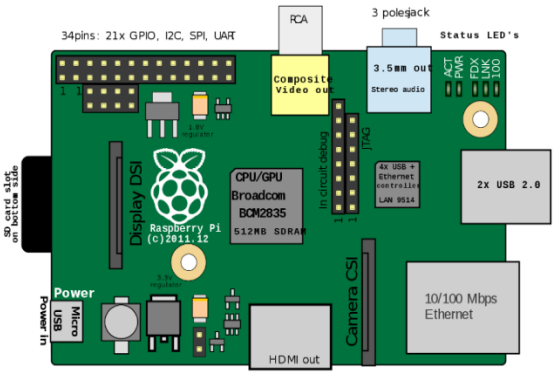
IV. Methodology

The system is based with electronic devices and used with wireless communication method which consist of the following .

- RASPBERRY PI 3
- FLIGHT CONTROLLER
- CAMERA
- ELECTRONIC SPEED CONTROLLER
- ELECTRIC MOTOR
- BATTERY

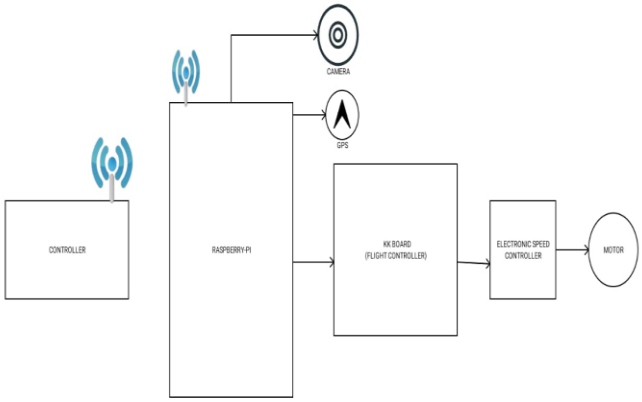
A. RASPBERRY PI 3:-

The Raspberry Pi is a series of small single-board computers. The boards have one to five USB ports. For video output, HDMI and composite video are supported, with a standard 3.5 mm tip-ring-sleeve jack for audio output. Lower-level output is provided by a number of GPIO pins, which support common protocols like I²C. A general-purpose input/output (GPIO) is an uncommitted digital signal pin on an integrated circuit or electronic circuit board whose behavior—including whether it acts as input or output—is controllable by the user at run time. GPIOs have no predefined purpose and are unused by default.



B. FLIGHT CONTROLLER:

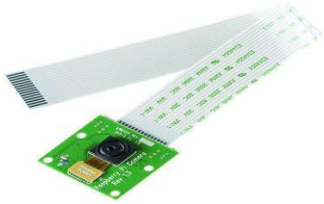
The KK2.1.5 is a mullti-rotor LCD flight control board designed by the grandfather of KK revolution. The LCD screen and built in software makes install and setup easier. The IC used in this flight control is ATMEGA 324PA 8-bit RISC based microcontroller.



C. CAMERA:-

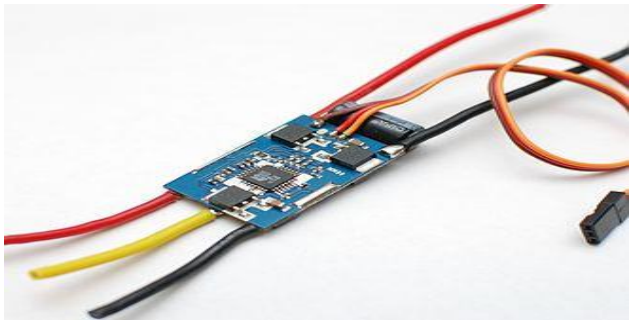
The 5MP Raspberry Pi 3 Model B Camera Module Rev 1.3 with Cable equips flexible cable for attaching with

Raspberry Pi 3 Model B. The 5MP camera module is perfect for small Raspberry Pi projects. The high-definition 5MP camera delivers outstanding photos but can also shoot video, ideal for drones or a CCTV project.



D. ELECTRONIC SPEED CONTROLLER:

An electronic speed control or ESC is an electronic circuit that controls and regulates the speed of an electric motor. It may also provide reversing of the motor and dynamic braking. Miniature electronic speed controls are used in electrically powered radio controlled models. Full-size electric vehicles also have systems to control the speed of their drive motors.



E. ELECTRIC MOTOR:

A brushless DC electric motor (BLDC motor or BL motor), also known as electronically commutated motor (ECM or EC motor) and synchronous DC motors, are synchronous motors powered by direct current (DC) electricity via an inverter or switching power supply which produces electricity in the form of alternating current (AC) to drive each phase of the motor via a closed loop controller. The controller provides pulses of current to the motor windings that control the speed and torque of the motor.

The advantages of a brushless motor over brushed motors are high power-to-weight ratio, high speed, electronic control, and low maintenance. Brushless motors find applications in such places as computer peripherals (disk drives, printers), hand-held power tools, and vehicles ranging from model aircraft to automobiles.

V. RESULT

It was able to make the Ranger drone to work as delivery drone and also as an surveillance system. By the help of Raspberry pi the unit was navigated under the GPS system and successfully reached the destination with the package. It was quite easy to understand the prototype controls under the Pi programming.

VI. CONCLUSION

It was possible to fly the delivery drone that can work in any weather condition for emergency purposes. This drone is very easy to handle with vast developments at low cost and better benefits.

References

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