Drone Technology for Medicine Supply

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Abstract: In this work, the drone delivery system using a flight controller is proposed. Drones are optimized to deliver medicines to rural areas, and their location can be tracked by using GPS. Drones like this can be very helpful in some areas where the terrain is rugged and not suitable for proper transportation. People who need medicines in emergency bases in urban area where there is heavy traffic situation. To address these connectivity issues, a national drone delivery system must be developed to deliver emergency care to patients. With this in mind, we developed a drone that can deliver essential medical supplies, such as tablets up to 1/2kg at a time, to find a solution. The Flight time is approximately 30 minutes, or longer if needed.

Keywords: **Drone, Flight Controller, GPS and Motor.**

1. INTRODUCTION

 A word often used in this technologically advanced and ever evolving world, drones is a great invention that has proven useful over the last decade. It has been seen in many places, such as military establishments, to monitor dangerous areas for monitor any threat or crime. It is important in provide good care and comfort. We have already seen the use of drones in agricultural applications where they are used to spread chemicals in organic field for easy and safe pesticides treatment of crops. Likewise, we have created a drone that can deliver important medicines in areas where local people do not have convenient transportation.

These drones are capable of delivering medicine to places where drug cannot be delivered by any means used by any distribution. In the event of an epidemics where people disagree and social distancing is important to maintains health, this drone delivery system can work as a powerful weapon in the fight against epidemics. Flood, earthquake etc. In emergency situations where existing transportation system are damaged due to various reason, autonomous drones can save valuable lives with less effort. This project can play a big role not only in rural areas but also in developed cities. Developed and fast-paced cities are often plagued by slow moving traffic. There are many efforts in India that the delay in drug delivery to a healthcare facility is very dangerous so this drone delivery to do anything in cities with traffic and bad roads. As the increase in the number of citizens and private vehicles will cause congestion on the city's roads, it is necessary to create a better transportations system his project is a small part of the process to finish it.

2. LITERATURE SERVEY

In their medicine drone delivery drone, they have used battery to produced necessary power to the motor, in case of our drone the flight necessary power to the motor, in case of our drone the flight time is for about 30 minutes and above and on using extra batteries simultaneously the weight increases. So, here we used hybrid generator that could provide necessary power input for drone [2].

A drone is a simple word is type of flying robot that can be remotely controlled by human operator. It is technology term also known as unmanned arial vehicle. With my new advancement in a drone technology, it is expected that drone may expand further to include diagnostic capabilities a namely in the imagine field the drone may expand further to include diagnostic capabilities a namely in the imagine field the drone is could be used by online Pharmaceutical which are doming as people are gaining interest in them the designed system is an internet- based drone using principle of IOT [5].

Voice activated autonomous quadcopter controlled by radio frequency communication. The purpose of these project to explore the available technologies to control quadcopter by using enhanced the voice command algorithm return inside flight controller allows to receive voice command and motion sensor through radio receiver and concerted to achieved and aim with respective command [3].

Medical drone will be flying from one location to other location with in less time. A person will be sitting at the distribution center monitoring the activities of the drone. When he/she get information about emergency situation then he/she will be launching the drone the location to the destination [16].

Useful drone functions include delivery of small items that are urgently needed in locations with difficult access. Timely delivery of urgently needed medications, blood and vaccines are critical in healthcare. However, location needing the delivery may have difficult access due to poor transportation infrastructure, or road blocked by serve weather, disaster, or traffic congestion. Since a drone can fly over an inaccessible road, innovative organization have begun to use drones for healthcare delivery. In section three, we provide a review of known example [13]

This article provides an overview of existing drone applications in the delivery of goods, planning, design and monitoring of transport infrastructure, as well as an overview of the possibilities of drone applications in the professional and scientific traffic and transportation engineering problems.[6]

The use of drones or Unmanned Aerial Vehicles (UAVs) in commercial applications has the potential to dramatically alter several industries, and, in the process, change our attitudes and behaviors regarding their impact on our daily lives. The emergence of drones challenges traditional notions of safety, security, privacy, ownership, liability, and regulation. With their ability to collect data and transport loads, drones are re-shaping the way we think and feel about our physical environment.

However, they also burdened with the perception as being surveillance equipment, and their commercial use has been criticized by both individuals and activist organizations. In parallel, drones have been legitimized by regulations and licenses from federal agencies, are used by companies for surveying, inspecting, and imaging, and their technological development are driven by active communities of hobbyists and enthusiasts. This tension presents unique challenges to their integration in the currently existing public, governmental and private infrastructure. In this paper, we will take a look at a few of these issues to understand how drones influence society, and present recommendations for practitioners, policy makers, and researchers studying this phenomenon.[8]

Nowadays world facing many problems in surveillance and security management, for this we are going to introduced a new proposed system is unmanned aerial vehicle. This system is to increases the efficiency and also reduces the man power. Drone is used to cry the camera for surveillance, it can cover particular area or particular person and capture the videos. Capture video can send to raspberry pi processing and processed data can be transferred from drone to nearby station with help of RF single. Unmanned aerial vehicle (UAV), an chief way of aerial remote sensing, takes been broadly used in various fields with the unique technical advantages such as flexibility, suitability, low cost and high-resolution digital surface models.[12]

3. METHODOLOGY

I. BLOCK DIAGRAM

The block diagram illustrates the high -level overview of the components involved in a drone system for medicine supply. The flight controller act as the central processing unit, coordinating the operation of various subsystems to ensure safe and efficient delivery of medicine of the desired location.

Drone Technology for Medicine Supply Using Flight Controller, Electronic Speed Controller, Brushless DC Motor, Battery for Deliver Medicine in Rural Areas, area Where lack of proper transportation service available for life saving and critical health product delivery. Flight controller is the one of the drone system responsible for controlling the drone's flight. It receives commands and communicates with other components to execute the desired actions. Flight controller ensure stability, navigation, and control of the drone during the mission.
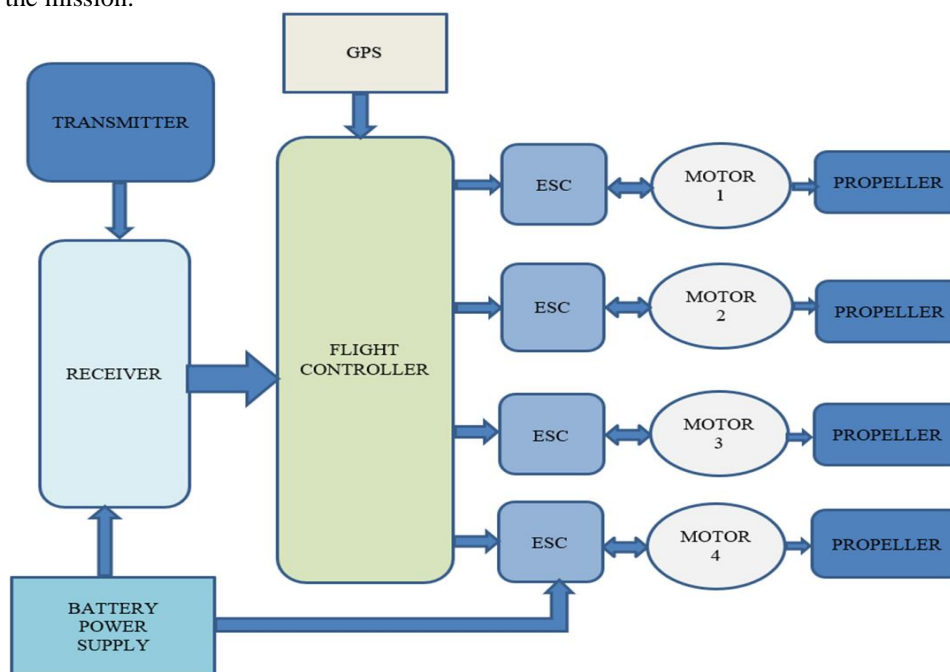

Fig 1: System Overview

Electronic speed controller is telling the motor how fast to spin any given time. we use four ESC for quadcopter. ESC connected to BLDC motor. ESC controls the speed of motor BLDC motor also known as electrically communicated motor. GPS module determine the drone's position, attitude, and orientation. here two types of propellers one is clockwise and other is anticlockwise. Propellers is type of fan that transmit power by converting rotational motion into thrust. Drone propellers provide lift for the drone by spinning and developing an airflow which results in pressure difference the top and bottom surfaces of the propeller. Battery provides power to the drone. We have used rechargeable lithium polymer battery (LiPo). Remote is an electronic device that uses radio signals to transmit commands wirelessly to the radio receiver.

II. BLOCK DIAGRAM DESCRIPTION

As the signals will be transmitted from transmitter and it will be received by the Receiver in the Drone. From the receiver the signal goes to the Flight controller where the signal will be processed and sent to the ESC's, which allows a specific amount of current to

the motor based on the signals it receives. The propellers are mechanically coupled to the motors such that they rotate and produce thrust. And the battery provides power supply to the ESC's and Receiver.

Transmitter:

The transmitter is the handheld remote control device operated by the drone pilot. It sends control signals to the drone, such as pitch, roll, and yaw commands, allowing the pilot to maneuver the drone.

Receiver:

The receiver is mounted on the drone and receives the control signals from the transmitter. It decodes the signals and relays them to the flight controller for processing.

Flight Controller:

The flight controller receives the control signals from the receiver and interprets them to control the drone's flight.

Battery Power Supply:

The battery power supply provides electrical energy to the drone system it typically consists of a rechargeable lithium polymer (LiPo) battery. The battery power supply is connected to the flight controller and provides power to all the drone's components.

Electronic Speed Controllers (ESC):

The Electronic Speed Controllers (ESCs) are electronic devices connected between the flight controller and the BLDC motors. They regulate the speed and direction of the motors based on the commands received from the flight controller. The ESCs convert the electrical signals from the flight controller into varying currents to control the rotation speed of the BLDC motors.

Propellers:

The propellers are mounted on the BLDC motors and generate thrust to lift and propel the drone. They convert the rotational motion of the motors into the aerodynamic force required for flight.

GPS (Global Positioning System):

The GPS module is responsible for determining the drone's precise position, velocity, and altitude. It receives signals from multiple satellites to calculate the drone's location. The GPS data is used by the flight controller for autonomous flight, position hold, and navigation control.

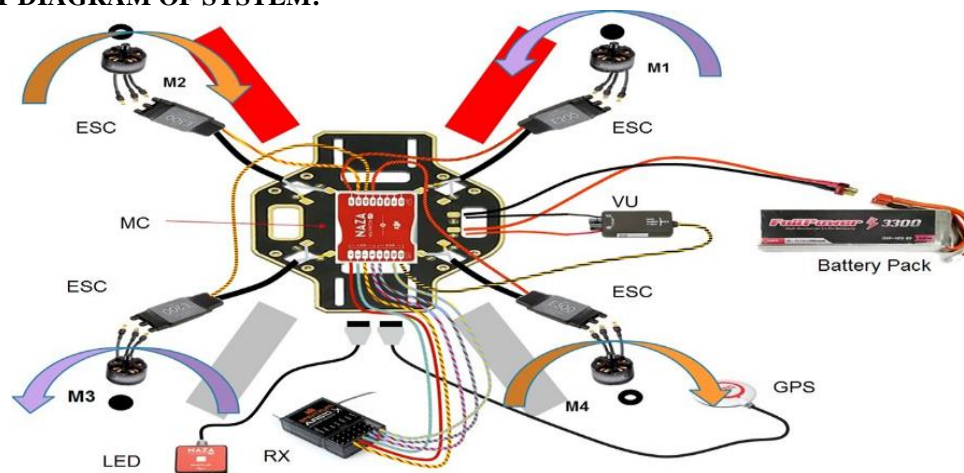**4.   CIRCUIT DIAGRAM OF SYSTEM:**

Fig 2 : Circuit Diagram Of System

The circuit diagram for the drone includes a LiPo battery for power, an LED for visual indication, a BLDC motor for propulsion, an ESC for motor control, a GPS receiver for navigation, and a Naza receiver for remote control signals. The battery powers the system, the flight controller interprets control signals, the ESC controls the motor speed, the GPS receiver provides location information, and the Naza receiver receives control signals from the remote controller. Four ESC's are connected to the four motor's these are M1,M2,M3,M4.

5.   RESULT

After configuring all the parts, assembling as required and configuring Software. Finally, obtained the Quadcopter which is shown below,

According to the proposed plan, the outcome of this paper results in the event of a quadcopter that features a stable flight. A frame where everything is mounted, motors, and propellers for the movement of the quadcopter, ESC to regulate the motors. The result's a stable flight platform. The entire system helps in various applications like surveillance and rescue missions. Longer flight times are often achieved by adjusting the trade-off between two variables, the battery capacity (weight) the efficiency of the thrust developed by the motors. The efficiency of the thrust has two factors which are the efficiency of the motor itself and therefore the propeller design. High speed transportation of medicine, vaccine that can be delivered through drone. Due to this less human resource needed as mission performed are autonomously. Every corner in India can be treated for medical emergency condition.

6.   CONCLUSION

In conclusion, drone technology has the potential to revolutionize the delivery of medical supplies, particularly in remote or hard-to-reach areas. With the ability to bypass traffic congestion and rough terrain, drones can deliver critical medical supplies such as vaccines, blood, and medications quickly and efficiently, potentially saving lives. However, there are still regulatory, technological, and logistical challenges that need to be addressed to fully realize the potential of drone technology in the medical supply chain. These include issues related to safety, privacy, and security, as well as developing appropriate infrastructure and training for drone operators. Despite these challenges, the future of drone technology in medicine supply looks promising, and it is likely that we will see more innovative uses of drones in the healthcare industry in the years to come.

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