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DEVELOPMENT & DESIGN REMOTE HEALTH MONITORING AND MEDICATION INCLUDED IN SMART RESCUE DRONE FOR DISASTER SITUATION

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Abstract: ***Disasters and Natural calamities are unstoppable and exceptional events causing loss of life and injuries on serious scale to the masses. The main task for search and rescue teams in these circumstances is to quickly reach every area, rescue the victims, and ensure that they receive aid in a timely manner.. However the rescue teams are unable to reach the all the disaster ridden areas at the same time due to lack of man power as well as absence of exact locations of the victims stuck in such disaster situations. Medical emergencies in such situations is another major problem as all the means of transport are usually broken. This project proposes the concept of unmanned aerial vehicles for assistance and medical diagnosis in Disaster and Flood related situations using IOT. The proposed system consists of an unmanned aerial vehicle which can carry out aerial surveillance of disaster ridden zones using guided system. The onboard Camera continuously captures the video feed of the surveillance and sends it wirelessly. If the presence is discovered, the precise location of the same will be transmitted to the rescue teams via IOT, enabling them to reach the scene right away and save the victims. The suggested plan also incorporates food and medical storage that can be quickly transported to such zones. The proposed concept also uses Onboard medical Diagnosis system which provides a provision of remote medical diagnosis of the victims in disaster zones using IOT. Thus proposed project eliminates the need of search in "Search and Rescue Operations" to make sure help reaches on time and quickly in such using IOT.***

Keywords: Disaster, Floods, Unmanned Aerial Vehicle, , GPS, Medicine Supply, IOT, etc.

I. Introduction

Communities all across the world are still being destroyed by natural catastrophes and armed conflicts. To

maintain public safety and the well-being of the environment, it is crucial to develop measures for both before and after disasters. Automation and robots have been used in a variety of fields recently to coordinate cooperative behaviour in distributed systems and provide a strong foundation for proactive applications of a complex nature, especially Especially in large-scale disasters that demand complicated activities to be accomplished by groups under extremely tight time and resource restrictions, large-scale disasters call for proactive applications of a complex type that have solid foundations in distributed systems. A robot is a device designed to perform one or more tasks swiftly and accurately repeatedly. Monitoring a certain region is a crucial component of robotic security systemsCommunities all across the world are still being destroyed by natural catastrophes and armed conflicts. To maintain public safety and the well-being of the environment, it is crucial to develop measures for both before and after disasters. Recently, automation and robots have been used in a variety of fields to coordinate cooperative behaviour in distributed systems and to lay a solid foundation for proactive applications of a complex nature. This is especially true in large-scale disasters, which demand that complex tasks be completed by groups under extremely tight time and resource constraints. A robot is a device designed to perform one or more tasks swiftly and accurately repeatedly. Monitoring a certain region is a crucial component of robotic security systems. Nevertheless, there are currently no systems that can use robots to their full potential in disaster-related scenarios.

Flooding is the most expensive type of natural disaster. In the developing world, floods can happen regularly and fatally, damaging infrastructure, crops, and homes. Flooding does enormous harm to both human life and property almost every year. Around 48 percent of all flood-prone areas The country's (40 mHa, as determined by the Rashtriya Barh Ayog) has obtained an appropriate level of protection from floods of a low to moderate size due to technological and financial constraints. It is impossible to provide defence against all types of flooding. Flood forecasting and warning are the most significant, reliable, and cost-effective non-structural tool for flood control.

These services are typically offered annually between May 1 and June 1 and between October 31 and December 31 during the flood season. All methods of communication, including fax, wireless, phone, mobile, SMS, email, electronic media, print media, social media, websites, etc., are used to distribute the forecast. Around 7000 flood forecasts and early warnings are distributed to the user agencies each year by the CWC regional offices during floods. For the past five years, CWC's estimates have frequently been more than 90% accurate.

II. II. The idea of an unmanned aerial vehicle for disaster relief and rescue using IOT is the main topic of this study. A control station will be used to oversee the navigation of this system. This technology continuously transmits a live video feed to the base station or the control station. The system consists of a camera that will continuously transmit data to the base station. In the event that such victims are found, rescue teams will be provided with their exact GPS locations so they may quickly locate them.

III. Literature review

Song et al. [1] have presented a method that uses unmanned aerial vehicles to route emergency deliveries quickly in a mountainous area. They designed a robustly programmed module in addition to using a graph proposition approach. Then they imposed the best practises for UAVs, which may be calculated by solving a problem of minimum cost inflow. They eventually determined the system's effectiveness.

By using an LTE data link, Gorczak et al. [2] have developed an unmanned standing system for maritime hunting and deliverance. The method is approximated in a lab environment utilising radio modules that were designed using software. utilising high bandwidth background business and real-world telemetry data from an autopilot system, actions are conducted on the operating subcaste. Evaluations show that our technology fails UAV requirements for trustworthiness and quiescence.

Bayanbay etal[3] They have suggested a strategy to improve the efficiency of emergency medical support in an emergency circumstance. This aerial vehicle can deliver stylish effects for drug force while saving time.

Bejiga etal[4], Convolutional Neural Networks for Near Real-Time Item Detection from UAV Images in Avalanche Search and Rescue Operations is a system that they have developed. They trained the model for object discovery and valued the discriminative characteristics using convolutional neural networks.

Yong etal[5] They created a system with profound drone vision literacy that is a fatal discovery in timber. They have trained a module in their system to recognise a human in wood. To stop illicit forestry practises such illegal logging and access into prohibited areas, it is important to detect mortal activity in forestry areas. Additionally, it is predicted that this design will expand drone operations for forestry observation, saving time and money.

Widodo Budiharto et al. [6] have suggested a technique that uses deep literacy for Rapid Item Detection for Quadcopter Drones. In this scenario, the drone finds the intended item target and delivers the information there. They have identified the object target using live videography and captured the specifics with GPS. To expostulate discovery, they used Mobile Net and the Single Shot Sensor (SSD) frame, which is a quick and efficient deep literacy-based approach.

IV. Methodology

The proposed design is divided into number of phases which will be carried out step by way to avoid the crimes. The entire approach of the design is divided into number of phases as given below

• The literature check and problem description The literature review is carried to study the current as well as being system. Different exploration papers from different exploration scholars were studied to arrive at the problem description.

• The UAV Fabrication and Assembly In this phase the introductory structure of the unmanned upstanding vehicle is developed. This involves mechanical fabrication of UAV and its assembly

• The telemetry System Telemetry is the data transfer from UAV to the ground station. In this phase the telemetry system is developed. This is responsible for transferring all the UAV data to the advanced ground station, which will be used for debugging during all the phases of development.

• The IOT system Development In this phase the IOT system is developed which will Communicate with the UAV over the internet and modernize the realtime position details of the victims as well as the navigation status. This phase the software as well as tackle is developed to connect the UAV to the pall and shoot the realtime data from UAV to the pall.

• The Web operation development This phase involves development of web operation to fantasize the data over internet

• Medical opinion system In this step, the medical opinion system is developed. The onboard opinion system helps the croakers in the megacity to ever checkup the cases in flood tide and disaster areasProgramming

- Testing
- Conclusion

IV. Working Principle:

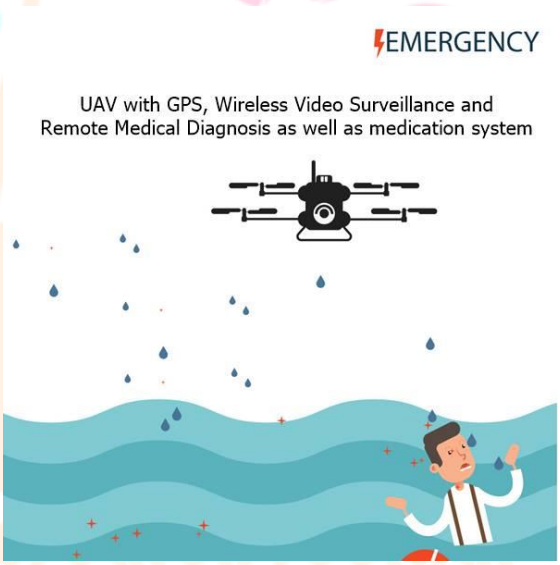


Fig 1. Working principle

As shown in the elucidative illustration the system correspond of development of the and medical opinion in Disaster and Flood affiliated situations using IOT. The proposed system consists of an independent unmanned upstanding vehicle which can carry out upstanding surveillance of disaster ridden zones autonomously using GPS guided system. The onboard Camera continuously captures the videotape feed of the surveillance and sends itwirelessly.However, the Exact position of the same will be communicated to the deliverance brigades using IOT, which can incontinently arrive at the position and deliver the victims, If the presence is detected. This conception also includes provision food and drug storehouse which can be distributed to similar zones without any detention. This conception also uses Onboard medical opinion system which provides a provision of remote medical opinion of the victims in disaster zones using IOT. therefore this design

eliminates the need of hunt in " Search and deliver Operations " to make sure help reaches on time and snappily in similar using IOT.

The unmanned aerial vehicle part:

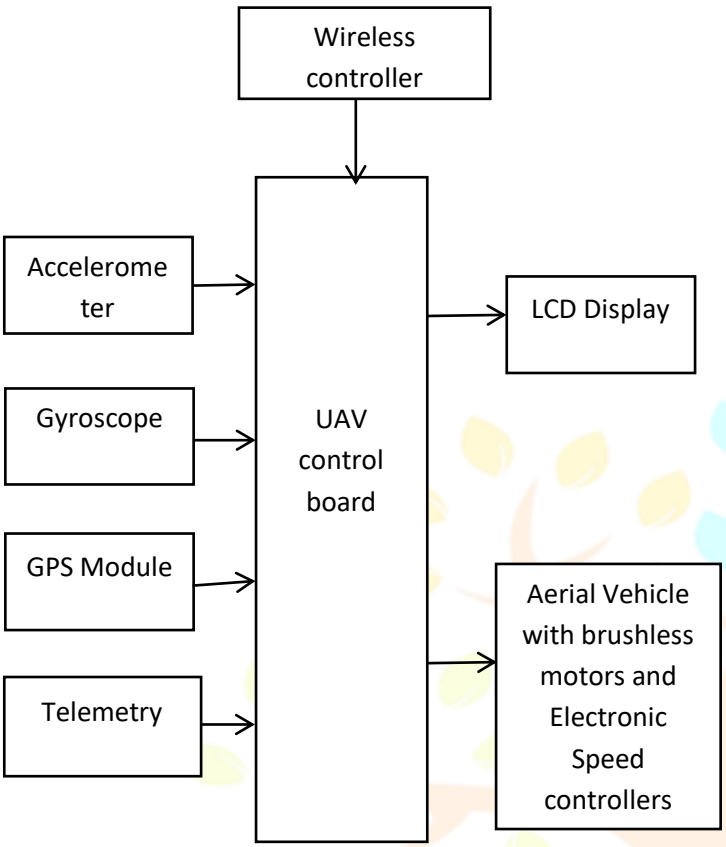


Fig 2. The unmanned aerial vehicle part

STANDARD COMPONENTS USED

1) 2mp camera
2) UAV controller board with Accelerometer and Gyroscope sensor and IMU
3) 2.4GHz wireless TX and RX
4) L293 D motor driver IC
5) Brushless ESC's with Simonk Firmware
6) Brushless Motors
7) Power Distribution System
8) Lithium Polymer battery with High Discharge
9) LiPo Charger
10) LiPo low voltage alarm module
11) USB ISP programmer
12) FTDI Programmer
13) PC
14) GPS Module
15) Telemetry
16) Heart Rate Sensor
17) Body Temperature Sensor

V Constructional Details:

Six motors drive six propellers on a hexacopter. The thrust produced by the propeller and hexacopter frame's propeller combination is used to lift the craft. The Plus (+) and X combinations shown in Figure 1 are the two most common frame configurations. The Hexacopter has six degrees of freedom (DOF), and because each rotor's rotational speed affects the six DOF, Each frame's motion dynamics model will be different. In this investigation, the Plus (x) configuration frame is used.

Plus Config:

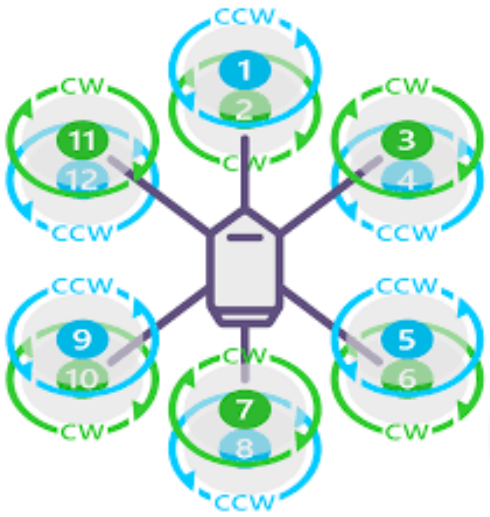
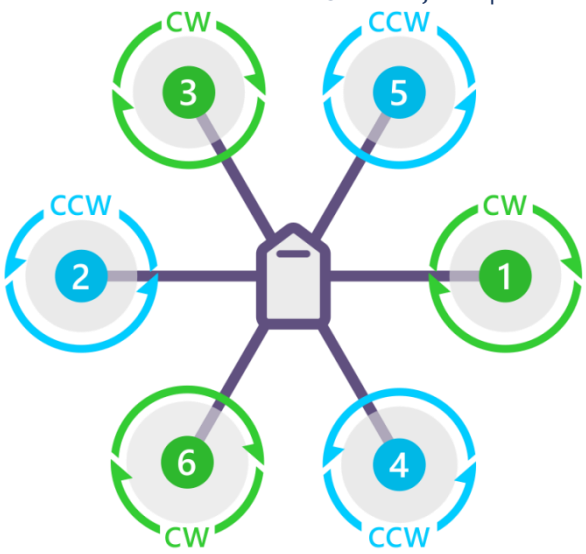


Fig 3. Drone Plus Configuration

X Config:



HEXA X

Fig 4. Drone X Configuration

VII Electronic Design

The hardware schematic is given below:

The PCB Layout is as shown below

VIII Result

Drone

Fig 7. Drone

Fig 8. Complete drone structure

IOT Panel

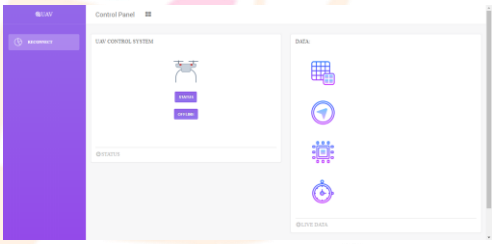


Fig 9. IOT Panel

VIIII Conclusion

The proposed design deals with the perpetration of unmanned upstanding vehicle for disaster situation. The system is enforced with GPS position module which helps to deliver the person from exact position. This system is unmanned Arial vehicle which is controlled from a control station for its navigation and for hunt and deliverance purpose. This system should shoot the live videotape of operation to control station. This will exclude the precious time which is wasted in searching and deliverance brigades can incontinently reach the exact position as the geographical equals are formerly known. The IOT system makes it easy to visualize all the data from a single admin panel. The onboard medical opinion system can perform remote medical opinion of the person and also use the drone as a carrier for the drug purpose.

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