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Drone Design for First Aid Kit Delivery in Emergency Situation

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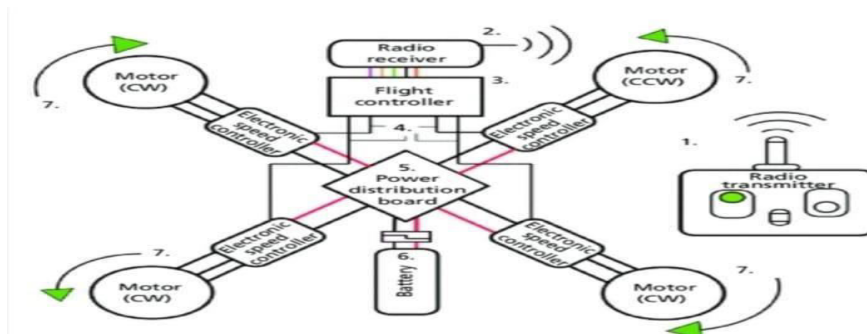
ABSTRACT: Ambulance getting stuck in traffic has resulted in countless precious lives. Statistics have shown that especially in the Indian traffic conditions the chances of such scenarios are at peak. We are providing a solution to speed up the delivery procedure of first aid kit in situations including but not limited to (i) Ambulance getting stuck in traffic, (ii) War torn regions with limited medical supply etc. From the minor ailment to the more serious injury a first aid kit can help reduce the risk of infection or the severity of the injury. With drones changing the face of human technology, it can be used in the medical field to assert timely delivery of essential first aid to people in not easily accessible regions. When the user books an ambulance for the victim, if the ambulance is stuck in traffic, Automated drones can deliver personalized first aid kit to the user location so that the victim can be diagnosed by the remedy medicines with assistance of doctor using web app till the ambulance arrives to the victim location and takes the victim to hospital

KEYWORDS: Delivery Drone, First Aid Kit, KK2.1.5 Setup, Public Health, Telemedicine, Rural Region.

I.INTRODUCTION

Drone which are otherwise known as unmanned aerial vehicles are remotely controlled or flown autonomously through software-controlled flight plans in their embedded systems, working simultaneously with onboard sensors and GPS. It has a wide range of applications, ranging from mining, security, aerial photography and to emergency response. The first hour of emergent medical care also known as "GOLDEN HOUR" is very important in situations such as heart attack or cardiac arrest. This time is wasted during the transfer process which leads to loss of many human lives. In such cases we can supply medicines to user location either from pharmacy or from ambulance, if the ambulance is stuck in traffic, there by fastening the delivery process. In recent years, advancements in unmanned aerial vehicle (UAV) technology have opened up new possibilities in various fields, including healthcare. One of the most promising applications is the use of medical drones in emergency healthcare. Medical drones present a revolutionary solution by providing a swift and flexible means of transporting essential medical supplies, diagnostic tools, and even organ transplants to remote or inaccessible locations. This technology has the potential to significantly reduce response times and improve patient outcomes during critical situations. They range in size and capability, from small consumer models to large military-grade systems. Types of Drones • Multicopter Drones: Popular for their stability and ease of control, making them ideal for aerial photography and short-range missions. • Fixed-Wing Drones: Resemble traditional airplanes, efficient for long-distance travel, and used for surveying and mapping large areas. • Hybrid Drones: Combine multicopter and fixed-wing allowing vertical take-off and landing (VTOL) and efficient horizontal flight. What is Quadcopter? A quad copter is a multi-rotor drone with 4 motors attached. Quadcopter stabilize its flight using electronic sensor and control system. There are two types of quad copters viz. 1- Plus configuration quad copter and 2- Cross configuration quad copter.

II. SYSTEM ARCHITECTURE



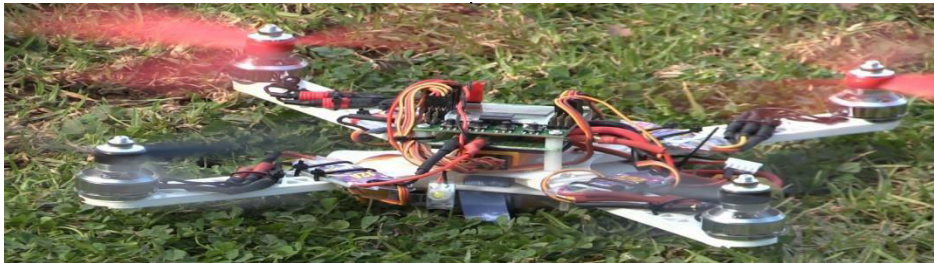
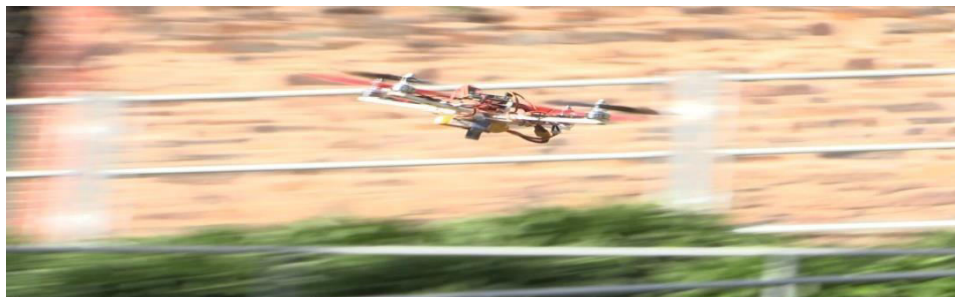
This diagram illustrates the design of a quadcopter drone, showing its main components and how they interact. The transmitter allows the pilot to send commands wirelessly to the drone. These commands are received by the onboard receiver (2), which sends them to the flight controller (3). Acting as the drone's brain, the flight controller processes these inputs and adjusts the speed of the motors to control movement. Electronic speed controllers (ESCs) (4) regulate the power to each of the four motors (7), which rotate either clockwise (CW) or counterclockwise (CCW) to maintain stability and enable precise maneuvers. Power is provided by a battery (6), which distributes electricity through a power distribution board (5) to all essential components. This configuration allows the drone to perform complex aerial maneuvers, including lifting, turning, and hovering, through coordinated adjustments of the motor speeds.

III. EFFICIENT COMMUNICATION

1. Quadcopter Frame: The rise of drones has transformed the way we capture aerial footage, conduct surveys, and explore previously unreachable areas. 2. Propellers: Drone propellers are a replaceable part of a drone that generate airflow by rapidly spinning which acts as a propulsion system that creates lift and enables a drone to fly. 3. Brushless Motor: The brushless engine's stator is equipped for producing its own magnetic field since it is constructed out of a few sets of power coils. 4. Electronic Speed Controller (ESC) An Electronic Speed Controller (ESC) is an electronic circuit that acts as the interface between the pilot's commands and the individual drone motors. 5. LiPo Batteries LiPo stands for Lithium Polymer or Lithium-ion polymer, which are rechargeable batteries made of polymer electrolytes. 6. Flight Controller A flight controller is a specialized electronic device found in drones that controls the flight operations. It serves as the brain of the drone, receiving input from the user and translating it into commands for the drone's motors, sensors, and other components. 7. Transmitter/ Receiver A radio transmitter is a handheld device that pilots use to control their FPV drone in flight. It sends signals to the drone's receiver, then the flight controller which translates those signals into drone movement. 8. KK2.1.5 Setup: For setting up KK2.1.5 board, first keep the transmitter on and ensure that the receiver is bound to transmitter. There are four buttons at the bottom of the KK2.1.5 board S1, S2, S3 and S4. Using these buttons, we will interact with LCD display.

IV. SECURITY

1. Reduce Emergency Response Time: Deliver first aid kits and essential medical supplies to emergency locations significantly faster than traditional ground transportation, particularly in remote, hard-to-reach, or disaster-affected areas. 2. Enhance Accessibility to Medical Supplies: Provide access to life-saving first aid resources in locations where healthcare services may be delayed or unavailable, improving survival chances in critical situations. 3. Minimize Risks for First Responders: Decrease the need for first responders to enter hazardous or inaccessible zones by delivering initial emergency supplies via drone, reducing exposure to danger. 4. Achieve Cost-Effective Emergency Response: Offer a more economical solution for emergency supply delivery compared to traditional vehicles, reducing operational costs for emergency response agencies, especially in high-frequency service areas. 5. Enable Autonomous and Scalable Operations: Develop a system capable of fully or partially autonomous operation, requiring minimal human intervention.

V. RESULT AND DISCUSSION**Fig1: Ready of Takeoff****Fig 2: Its working****Fig 3: whee****VI. CONCLUSION**

Drone use in medicine has many benefits, including rapid assistance, cutting down on travel time to the patient, reducing complications in the injured due to shorter recovery times, assisting and enhancing the fundamental operations of medical emergency teams, and the ability to reach areas that are inaccessible for conventional medical transport (due to floods and blocked roads, for example). The medicine delivery service plays a vital role in saving human lives during medical emergencies, and the delivery of medical supplements can be possible even in rural region can be possible. The Integrated medicine service in drone guarantees that patients receive the appropriate care at the appropriate time. To save time spent on medicine distribution and emergency medical services in remote areas, it is economically more beneficial to the masses if such projects are performed and regulated by the government, as the need to create profits is significantly reduced. We also use additive manufacturing technology to develop drone parts such as propeller blades, landing gear, frames, camera mounts, and delivery boxes to reduce the complexity of complex part development, mass customization, and improved performance.

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