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A Survey on MARK8 Drone Delivery System for Medicine Delivery

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ABSTRACT

Drones are pilotless aircrafts that were initially used exclusively by the military but are now also used for various scientific purposes, public safety, and in commercial industries. Ordinary drone applications in medicine include the assessments for delivering aid packages, medicines, vaccines, blood and other medical supplies to remote areas with the help of security by using QR Code ; providing safe transport of disease test samples and test kits in areas with high contagion; and potential for providing rapid access to automated external defibrillators for patients in cardiac arrest. Aerial drones of today can be remotely controlled and launched in air using various methods depending on their type.. The rapid delivery of vaccines, medications and supplies right to the source could quash outbreaks of life-threatening communicable diseases.. Drones help provide emergency healthcare to patients from a distance or while mobile In the future, small indoor drones could deliver medicine to the bedside of a patient from the medical, thus eliminating some human steps. Pharmacists can work more efficiently as supplies can be call to the bedside instead of the time- consuming task of gathering necessary items. and our proposed systems include the most efficient and effective algorithms which make it very helpful for delivery medicines for people via drone.

General Terms : Algorithm, disaster recovery, programming, web application

Keywords : Arduino uno, GPS, ultrasonic sensors, GSM module, Python, Video streaming, barcode scanner.

I. INTRODUCTION

Drone use for commercial purposes has gotten much press of late due to different commercial announcing it to use drones to deliver to customers. This is a new idea between life and death. They can transport with many intended and unintended sequences. The future use of drones in medical purpose also is very thought provoking. Well for starters, drones already have been trailed to deliver food aid and medical supplies to areas hit by disaster, such as Haiti, by a start up called Maternity. The rapid delivery of vaccines, medicine, blood and supplies right to the source of life-threatening communicable diseases. Technology, portable shelter comprise the vast list of could be delivered in areas where critical situation. Providing communities with emergency health care is no easy task for communication. Medical professionals from emergency responders and third world workers to time-stressed staffers in hospitals/medical shops face a host of challenges everyday—challenges unmanned aircraft systems, or UAS, can help overcome. Drones make it possible to deliver medicines in emergency situation and people can take care of themselves and other medical supplies to rural areas. Our drone have the ability to reach victims who require immediate

medical attention within minutes, which in some cases could mean the difference medicine within hospital walls and medicines between hospital buildings, as well as give elderly patients tools to support them as they age in place. UAS offer a variety of exciting possibilities to the health care industry, possibilities that help save money as well as lives. Drones are going to decrease the effects on human beings that provide care and decrease the cost of working people. Being able to cross long distances at faster speeds to deliver medicines products is huge benefit. Transporting medicines products between medical shops and home, for example, involves vehicles on the ground that are prone to accidents and delays. Drones can help decrease those incidents. This is why drone helps to transport medicines quickly and improve medical outcomes. This section will discuss some of these attempts and their shortcomings. In the system, Motors, GSM Module, Bluetooth, Arduino UNO, Flight Control, ultrasonic sensor, and battery were used.

II. OBJECTIVE

The main objective is to deliver medicines in emergency situation with help of advance technology. In this technology controlled world, we are trying to help the people getting medicines quickly , this project proposes associate in delivering medicines with the help of QR code.

III. LITERATRE SURVEY

Mrs Wasim Fatima. S, "Unmanned Aerial Vehicles for space exploration", [10 October 2017]

This research paper was proposed for a system which provides the study of space is not only carried out by astronomers with telescopes but also the space exploration of space is conducted both by unmanned drones and human spaceflight. This paper content deals with the role of unmanned aerial vehicles on earth and the future directions for the use of UAVs in space for exploration and observation purpose..

Miroslav Kratky and Jan Farlik, "Countering UAVs – the Mover of Research in Military Technology", [September 2018]

This research paper was proposed for a system of the risk of misuse of UAVs by criminals, guerrillas or terrorists has compelled authorities, scientists and defence industry to face this threat. Organisations have launched crucial infrastructure defence programs to cope with UAV threat. To solve this problem, it is necessary to develop disciplines improving the air space surveillance and UAVs elimination techniques. The substantial aspects of the UAVs detection and elimination were analysed, being supported by a number of conferences, workshops and journals articles. The contribution of the study in the Counter–UAV area consists particularly in generalisation and evaluation of the main technical issues. The aim of this paper is to emphasise the importance of developing new scientific fields for countering UAVs, and hence it is directed firstly on the scientific audience.

S. G. S. Fernando, "CarryMe: Drone Delivery System for Flooded Area", [December 2017]

In this article, "CarryMe" is the drone delivery system which can be used to provide better disaster recovery by resolving these issues. Collision avoidance algorithm, obstacle detection algorithm, video streaming and autopilot are the main functionalities of this implemented system. A flooded area can be identified using a map through the web application of CarryMe and the drone controlling interface which user- friendly and it can serve several people using several drones at the same time.

Guang Yang and Xingqin Lin, "A Telecom Perspective on the Internet of Drones:From LTE-Advanced to 5G".

In this article, they elaborate how the drone ecosystem can benefit from mobile technologies, summarize key capabilities required by drone applications, and

analyse the service requirements on mobile networks. It present field trial results collected in LTE-Advanced networks to gain insights into the capabilities of the current 4G+ networks for connected drones and share our vision on how 5G networks can further support diversified drone applications.

Lawrence G. Muchemi, "An Autonomous Unmanned Aerial Security Surveillance System to Enhance Security in Remote Territories", [December 2017]

In this article, With the use of Unmanned Automated Aerial surveillance vehicles, we can be able to curb the criminals by surveying the security prone territories where it is not safe for a human to go and report in advance. The implication of the study is that it will provide a basis for further development, automation and adoption of UAV in aerial security surveillance and reporting to authorities the information that will be used to raise alarms and enhance security.

Michael K. McCall, "Small Drones for Community-Based Forest Monitoring: An Assessment of Their Feasibility and Potential in Tropical Areas,[24 June 2014]

In this paper they assess: (1) the feasibility of using small, low-cost drones (i.e., remotely piloted aerial vehicles) in CBFM programs; (2) their potential advantages and disadvantages for communities, partner organizations and forest data end-users; and (3) to what extent their utilization, coupled with ground surveys and local ecological knowledge, would improve tropical forest monitoring. Use of small drones can help tropical communities to better manage and conserve their forests whilst benefiting partner organizations, governments and forest data end-users, particularly those engaged in forestry, biodiversity conservation and climate change mitigation projects such as REDD+.

Burchan Aydin and Emre Selvi, "Use of Fire-Extinguishing Balls for a Conceptual System of Drone-Assisted Wildfire Fighting ,[12 February 2019]

This paper examines the potential use of fire extinguishing balls as part of a proposed system, where drone and remote-sensing technologies are utilized cooperatively as a supplement to traditional fire fighting methods. The proposed system consists of (1) scouting unmanned aircraft system (UAS) to detect spot fires and monitor the risk of wildfire approaching a building, fence, and/or fire fighting crew via remote sensing, (2) communication UAS to establish and extend the communication channel between scouting UAS and fire-fighting UAS, and (3) a fire-fighting UAS autonomously traveling to the waypoints to drop fire extinguishing balls (environmental friendly,
heat activated suppressants). This concept is under development through a trans disciplinary multi-institutional project.

IV. PROBLEM STATEMENT

The process of seeking medical attention in remote regions of India should be improved to increase healthcare accessibility. The healthcare system should aim to provide the best and fastest possible medical attention to all people throughout the country while optimizing for cost and time efficiency. However, India's current healthcare system is inefficient and lacks the accessibility of medical services in various regions of the country. By being inefficient, outdated and slow to provide services, the current healthcare system causes distress and un favourable scenarios in remote communities where people are in need of immediate medical attention.

V. PROPOSED SYSTEM

In previous system we are using different drones for different purposed like delivering food in flooded area, delivering medicines in military area. But in this system our drones could deliver medications and supplies to patients being cared for in the home instead of a hospital-based setting. The future will see more outpatient care and even home-based care that used to

be delivered in the hospital. For many emergency situations, smart drone may make it easier and safer to provide this home-based care. When a provider rounds on a home patient, medicines can be drawn and immediately sent by drone to the hospitals to be tested. Emergency treatments like medicines, blood, antibiotics and treatments ordered by the provider may be delivered to the home by drone. This technology may allow more people in nursing homes to receive care at home for a longer period of time, which would increase the independence of the growing boomer population as they age. A drone could deliver a meal to someone who cannot prepare his or her own meals. In this system we are using security with QR code. Unauthorized person cannot access the drone delivering box.

VI. SYSTEM REQUIREMENT

Requirement gathering & analysis

The requirement gathering was done using primary data and secondary data. As primary data interviews were conducted with the Medical emergency medicine delivery Centre. The results of interviews were, current methods like online delivery medicine, walk in and others methods are not possible to reach every area because some areas are inaccessible due to the severe damage is done by the traffic and other issues. Therefore proper method like drone which is very small compared to other delivery methods is the most suitable way to deliver goods in order to rescue humans life was the final conclusion of the interviews. As the secondary data project team went through several research papers. In this, research team researched for existing similar systems and analysed their functionalities, to better understand the methodologies used. Information regarding Obstacle detection, collision avoidance and autopilot techniques of the drone were analysed using existing research as well.

A. Hardware Requirement:

- Arduino UNO
- Propellers
- Brushless Rotor Motors
- Drone Arms
- Gsm module
- Bluetooth
- Power supply
- Sensors .
- Flight controls.

B. Software Requirement:

- Arduino UNO IDE
- Python IDE
- AWS Cloud IOT interface
- Android or IOS Application to connect with the cloud.

UAV software Requirements

VII. SYSTEM ARCHITECTURE

Figure 1 is illustrated the Architecture diagram. It is explained about working of drone. First, customer will placed order from supplier. After order placed supplier will package the order with QR code Encoder for security purpose. No other unauthorized people can access to package or drone. The drone will find smallest route with the help of GSM Module. The transport will find proper destination with the help of map, after arriving the destination the security module will ask for QR Code(Decode).

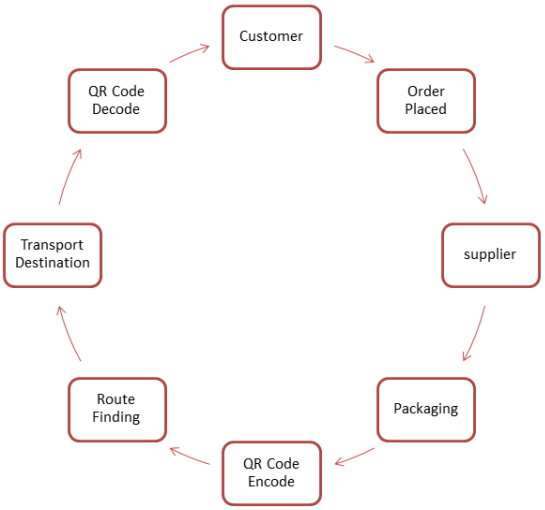
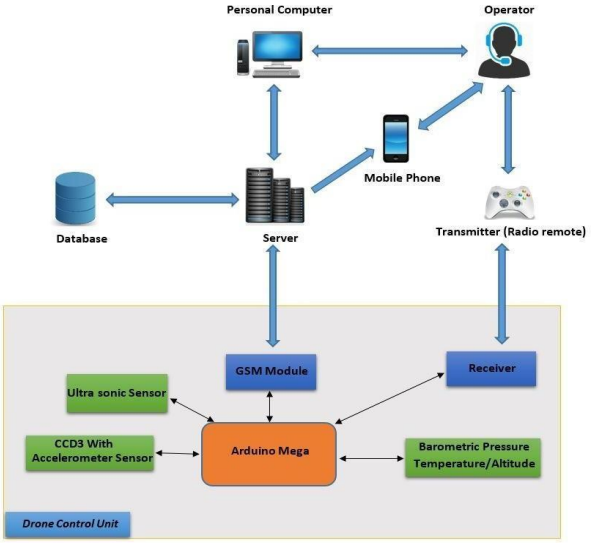


Figure 2 is illustrated the Architecture diagram. It is explained about main relationships between the user and other system components. Operator can access to the web application through the web browser which is at the personal computer. This web application is hosted in separate server. Location details provided to the web application reach the drone control unit through the server. Details related to different drones like videos, good delivery details are gone to the database through the server and whenever operator request these details those are travelled from database to server and finally server to web application which is at the personal computer. Now every detail can be viewed by the user. Like this each and every component is worked together to deliver fully functional system.



a) Obstacle detection and collision avoidance

Onboard sensing and onboard processing power are the factors of limiting the autonomy of the obstacle detection. Hardware setup and processing pipeline is allowed to fully autonomous medicine delivering drone to detect obstacles in almost all directions .3D laser scanner which is capable of providing an omnidirectional view with the spars measurements at a lower frame rate. To overcome this issue, a pair of stereo cameras have connects that is capable of providing additional sparse measurements at high frame rate. To detect the obstacles which have difficulties with detecting and the small in sizes such as tree branches or cables at high frame rates as well as transparent obstacles ultrasonic sensors are used by them. The cost of this product is very high payload system allows various devices to be attached to the drone. The smoke composition of a fire can be communicated using a gas measurement device. It is a greater chance for medicals aware about the situation. Using obstacle detection and collision avoidance technology drone enter the danger zone to consume and thermal image camera can assist in searches for missing persons who are lay down in forests, fields and etc. Obstacle detection and collision avoidance technology becomes an emergency tool for better Transportation during organ delivery and medicine delivery too. As well as a small flying machine can help humans in their daily work. In the object avoidance module, ultrasonic sensors are used to increase detection resolution and sensor data reliability.

b) Video streaming

MARK 8 is able to doing a better video streaming by using this system."Public Spaces Mobile Video Chat" provides a parallel experience using the technology of video streaming. Video streaming, being the best in

navigation creates a very intimate experience with the remote partner. But this can lead to distractions from the real world. For this Probe technology, Video Streaming is used along with the "Shared Geocaching". Issues were raised around privacy, safety, navigation and micro‟ shared experiences.

Drone autopilot system

As an answer to the traditional time consuming and expensive drone delivery system, viable drone based autonomous delivery system was designed and implemented. Full autonomous carry and delivery static route navigation, and single touch point interaction was the main requirement of this system. Autopilot drone Electro-optical identification technology is advanced enough that acts the role of the main control unit in order to control the autopilot system.NAZA-M light flight control system with the GPS module was used to build the overall system. In order to take clear aerial photos 5- M pixel camera was used and the images which were taken from the camera processed with the NDVI technique which is capable of providing the details on the photosynthesis status of rice leaves. This system can be used to evaluate the stress of the plant and the health. Stability and flight time are the issues related to the system which was introduced by them .

c) Arduino technology related to drone

Drone is formally known as Unmanned Arial vehicle . Essentially drone is an aircraft without a human pilot onboard a flying robot. Today most drone systems use Arduino technology because it is easy to use. The most popular and common Arduino board is Arduino Uno. It is a microcontroller board based on the Atmega328. It has 14 input/output pins, 6 analog inputs, 16MHz ceramic resonator, USB connection, power jack and a reset button. It is needs connected to the computer with USB cable or powers it with AC-to-DC adapter to get started. The power source is selected automatically.

VIII. CONCLUSION

The aim of this model is to style and implement the applications of UAVs were reviewed presenting IoT sensors that are essential for the related scenarios and use cases. Considering the drones as IoT devices and the support from emerging technologies such as GSM Module, we analysed the hardware requirements for the corresponding applications and overview solutions for fleet management over aerial networking. The issues related to privacy and security were presented, focusing on users' and drones' privacy. Finally, we proposed a framework that supports and enables these technologies on UAVs, providing advanced security and privacy by incorporating novel vision-based solutions for scene analysis. According to the proposed framework, a hybrid centralized–distributed framework controls UAV flights, handling operations like the registration, identification, ranking, and management of moving objects. As future work, we plan to evaluate the proposed framework, both within laboratory settings and in real-world scenarios, in order to adjust it for context-specific application domains.

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