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LIFE SAVER- An UAV Organ Transportation Drone

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Abstract**—***During surgeries situations arise where organs required to be transplanted are to be brought from other hospitals someplace else. Transportation services like ambulances, trains and etc. are used for this transportation. But sometimes due to traffic and other problems delay is caused in this transportation. This delay can lead to serious critical problems and situations. To overcome this delay and avoid the critical situations this idea of organ transportation with the help of UAV (Unmanned Aerial Vehicle) was implemented. Transportation by these UAVs is fast as well as the factors like traffics were also overcome. The project is aimed at designing a semi-automatic organ carrier drone with very high accuracy to reduce the transportation time of the organ which saves the life of the person. Life saver is an UAV which is capable of caring human Organs by air medium from one hospitals to required hospitals within the minimum time.*

The traditional method for transferring the organs is done by with the help of train or other vehicle. In many cases organs are available for the transplantation but due to traffic or delay in transplantation patient may cause death. Our drone will carry the organ in minimum time with safety. This drone is automatic means it is self-controlled drone there is no man is required to control the drone. It can achieve speed up to 105kmph.This drone used GPS and telemetry for automatic flight. It has auto Temperature control mechanism, which can adjust according to the organ.

Keywords—life-saving, drone, automatic, organ transportation, speed.

I. INTRODUCTION

The transportation of Organs has been having issues due to traffic and other problems. Due to these problems the person who has to be implanted with the organ may face many critical situations and in some cases even die. Traditional methods of organ transportation are not efficient to transport the organ which may cause delay in transportation and this delay can cause patient's death. There is rigorous need to reduce the delay in transportation. With our project the time factor can be reduced. Traditional methods like bus, ambulances, trains etc. take more time for transportation. This time can be reduced drastically with the help of our project. In traditional methods the modes of transportation is changed for travelling long distances whereas in our project we can use single mode of transport. For Organ Transportation the most important part is the preservation of the organ. We have designed the preservation of organ i.e. our cooling mechanism in such a way that it automatically maintains the temperature favorable for the organ according to the surrounding temperature. The GPS and Telemetry we have used provides a proper path flow for the drone to safely reach the destination. Organs are delicate and they cannot be exposed to any vibrations. We have taken good care about the stability of the drone so that the organ will not suffer from vibrations. Once the organ is placed in the preservation box and attached to the drone there will be no detachment till the drone reaches the destination location. For transportation using traditional methods many people have to spend their valuable time for transportation of a single organ but as our project is an unmanned aerial vehicle there is no man physically required for transporting the organ, only a drone operator who will control the drone using a remote-control at a specific location. The organ will be delivered very quickly as compared to the traditional methods because the drone can fly up to 150kmph speed; thus reaching the destination with minimal delay and avoiding critical life threatening situations of the patient that can arise due to delay.

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II. MATERIAL AND METHOD

First we set the drone in remote controller mode or in UAV mode as per require and set the require temperature of the organ container set the starting point and the ending point (destination) of the flight. Then it will be carry the organ safety with the minimum vibration simultaneously .it will send the live path coverage and the video and maintain the temperature of the container .it will send the voltage of the battery of the drone and the container when the wind pressure is more that time. It will hold the passion with help of GPS system when the reaches to his destination point. It will land very safety slowly with no damage and detach the container from the drone with the help of hinges and servo mothers after that it will follow the retuning path and it will come back at the starting point with the help of return to launch position.

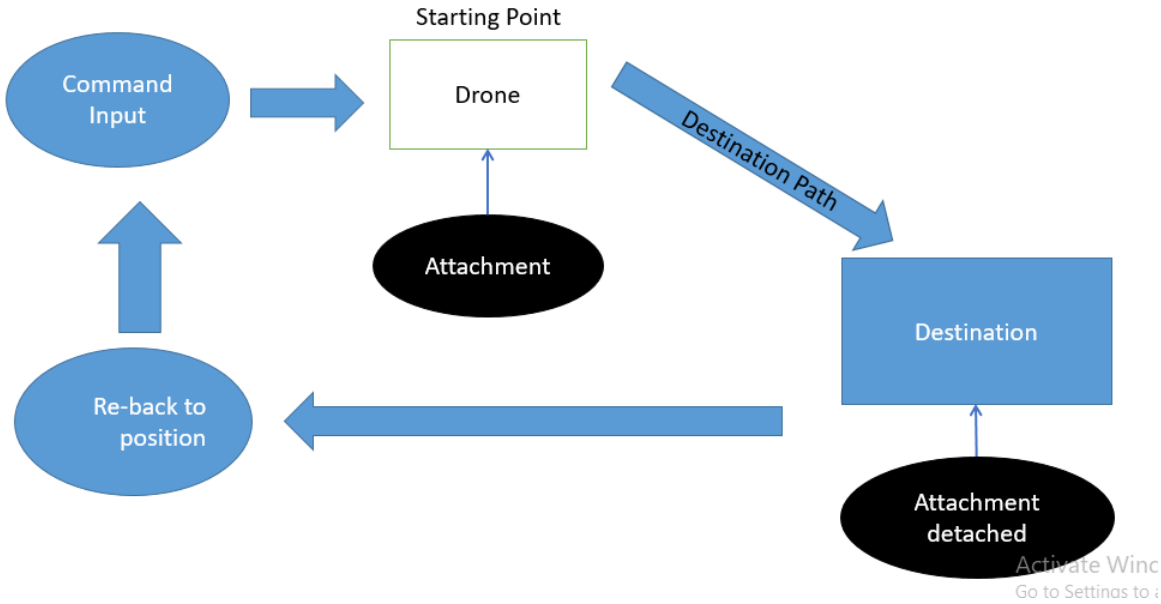

FIGURE 1:Working of the LIFE SAVER

1.1 Designing and Working of Drone:

The drone consists of Hexa Frame, 6 motors, 6 ESC and Flight Controller Board with GPS and telemetry system.The drone is semi-automatic which means a drone is controlled with the remote and with UAV system which is automatic. When we turn on the remote then Flight Controller send the signal to the ESC(Electronic Speed Controller) and will start the Multirotor motor. All the motors are revolving in opposite direction to each other with the same speed. The drone will fly according to the geographical conditions. The Flight Controllers consist of different types of sensors which are Gyrosensor, Accelerometer, Magnetometer, Barometer and Microcontroller. Gyro Accelerometer is provide the stability to the drone it avoid to tiltation of the drone towards the ground or to the sky, it will maintain the stability.Barometer provide the altitude hold where the drone can hold at perpendicular height which we want.When the UAV system is activated that time just we have to plot the points with the help of Google Maps and then drone automatically follows the path.

1.2 Designing and Working of Cooling Container:

The life saver is a semi-controlled UAV drone which is specially design for organ transportation from 1 phase to another place with in a minimum time.

First the we set the temperature of the organ container according to which organ we have to transport. When the temperature set at particular ^{o}C it can maintain the temperature as well. If the temperature increases the LM35 sensor send the signal to the microcontroller which turn on the relay module which act as on off switch.

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If relay get the signal from the Arduino then it turn on the cooling fan and turn on the thermoelectric peltiers till the temperature is equal to the set temperature when the set temperature is equal to the container temperature then the relay turn at the fan and peltiers accordingly.

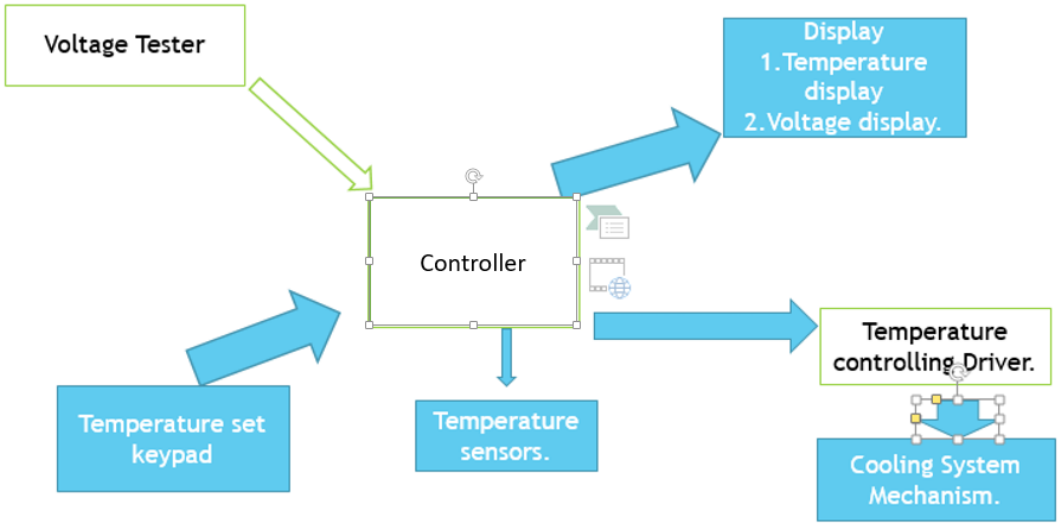

FIGURE 2:Working of the Cooling Container

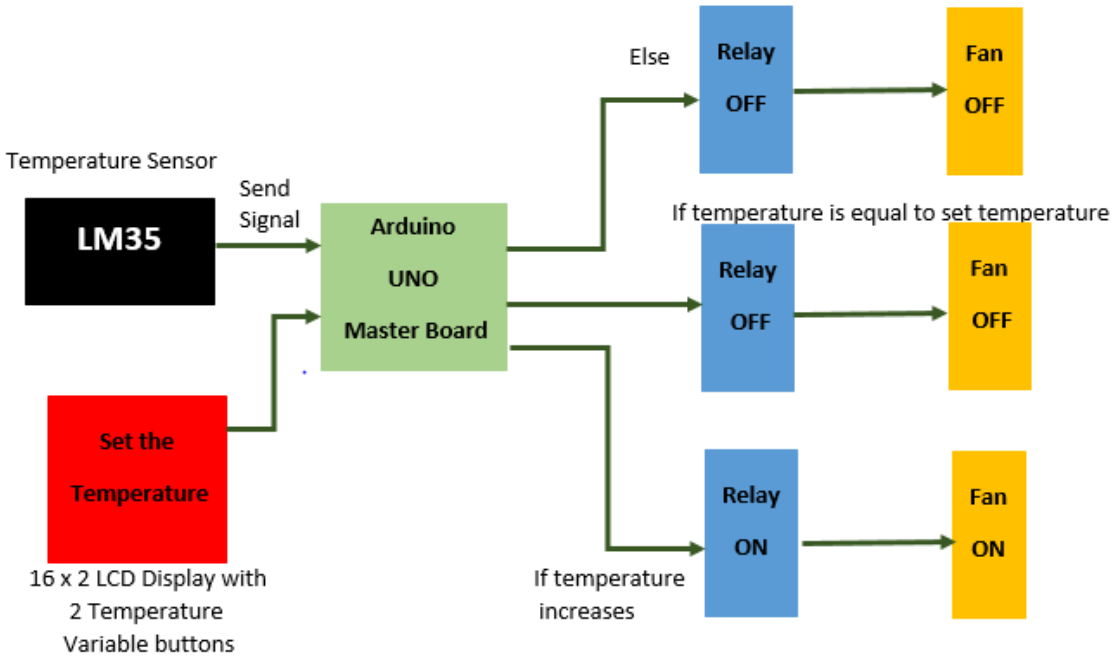

FIGURE 3:Block Diagram of the Cooling Container

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III. RESULT AND DISCUSSION

The result expected from this project of ours is that in the field of organ transportation we can bring a major breakthrough. Till date the transportation done of organs has been slow and time consuming which has been even leading to certain critical life threatening situations but with this LIFE SAVER DRONE of ours we will consider this main factor, TIME.

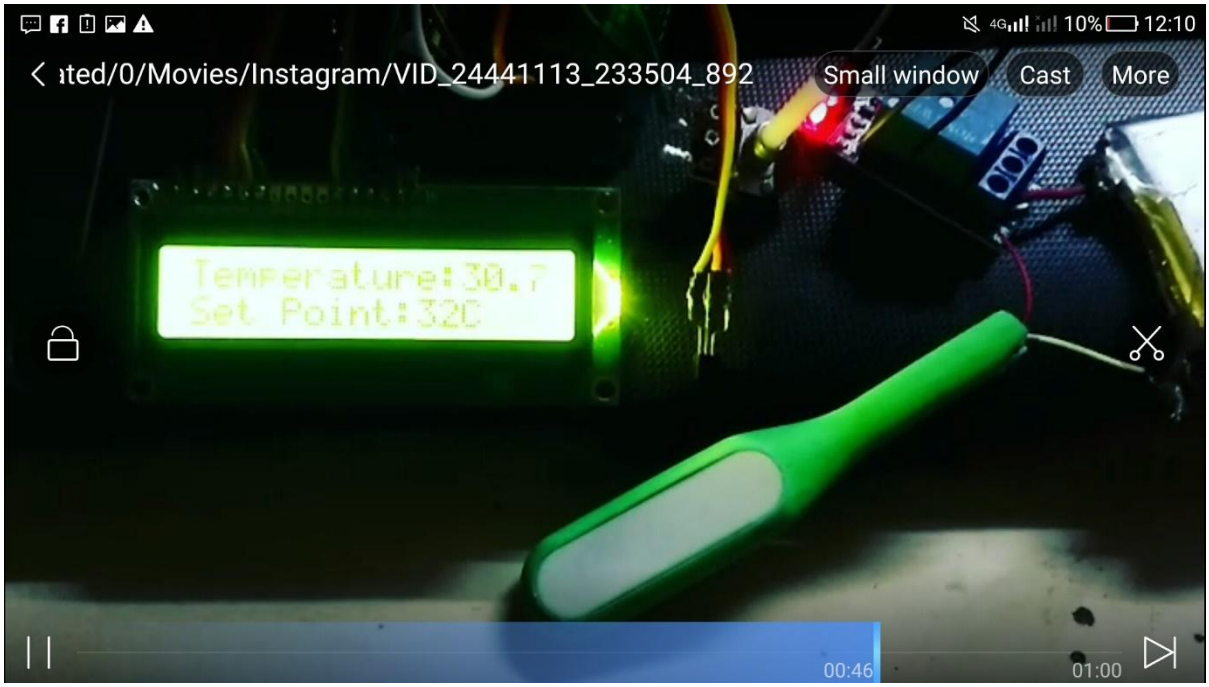

FIGURE 4: Output

IV. CONCLUSION

The project of ours will consume less time to transport the organ. It is expected that the organ will be transported without any complications. The temperature required for various organ will be achieved properly. There will be proper stability of the drone if as it is UAV there will be no person inside the vehicle (drone) the organ will be received to the required receiver within less time and proper accuracy. If there will be any complication in the path the drone will automatically select safe place and land itself. If there is any obstacles in the way it will automatically take note of it and avoid it. There will be a start point and end point and selected path which will be properly followed by the drone.

The use of drones have made many transportations and other application very fluent and with less drawbacks.

Organ Transportation Drone amazingly reduces time and improves accuracy. Due to air as a transport medium there will be no traffic issues as there is very scarce traffic in the sky.

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