

BAYWATCH: USE OF UAV AS A LIFE SAVER

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Abstract - According to WHO (World Health Organization) more than 3,60,000 people die due to drowning worldwide and just in India around 29,000 people die yearly due to drowning making drowning the 3rd largest reason for unintentional deaths. Thus, our project aims at saving these precious lives and making life in water much less risky especially at private pools and beaches. The main problem is detection as drowning men cannot signal for help, or scream, and thus it usually gives a very short timeline of maximum 1-2 minutes of saving him. The presence of lifeguards reduces the risk of drowning however there are some shortcomings as they are sometimes not fast enough, or maybe cannot spot the drowning person. Thus, our project will be of great help in these matters. The main objective is to save lives in the ocean without putting at risk the lives of those who save. Thus, to protect life of guards also this project will be a boon. The basic ideology behind this life saving bot is that whenever someone is drowning on beaches or any private pool the bot rescues them. The drowning person will have his/her smartphone attached to his/her arm. On his/her phone an application will be running. Whenever the person is in distress he will press the volume down button and the GPS location of the person will be given to the drone through Wi-Fi. After receiving the location, the drone will get triggered and will automatically fly to that particular location. After reaching to the location the drone will drop the float near the drowning person. After dropping the tube, the drone will return back to its original location thus, saving life of the person.

They informed us about rip currents present in the seas which are not easy to detect which is a strong localized narrow current of water moving away from the shore and if swimmers get caught up in this current, it becomes impossible for them to get out of it alive. It becomes easy for the lifeguard to save victim during low tide but during high tide it's a big challenge as huge as ocean itself to save the victim. The clothes which victim wears is also responsible during drowning. The lifeguards at Juhu beach use equipment's like lifejackets, tubes, jet ski & floats, kayak. The Jet Ski can reach to the victim in one minute but the cost of one Jet Ski is \$15000 which is not affordable. They also informed us about various types of tubes some of which can accommodate 5 people at a time for 1 day or 2.

[2] Prasanna Shevare DronaAviation Pvt Ltd, IIT Bombay

Drona aviation department at IIT Bombay helped us to solve all our doubts related to building our drone, the components needed, software, coding, the problems we would face, solution to those and thus immensely helped us in preparing the actual physical layout of our drone. They taught us that a DIY project comes with the advantage of cheaper, easy-to-acquire spare parts in case your product gets damaged or needs troubleshooting, whereas in a readymade product, it would need a replacement or an expensive repair process. They told us to start with a small drone, develop the algorithm for detection of the person sending the drone to that location. Development of API for servo and designing the PCB for bigger drone. After all the testing is done on smaller drone than to go for bigger one. The flights time the flight processes and the main hurdles for flight. During flight the common issue is that sometimes the drones get out of control and it can get damaged drastically so a small drone is more feasible and reliable.

[3] Colonel Abhijeet adgaokar and Colonel kishor (ARMS ARTILLARY CLUB, NASHIK CANTONMENT)

Here we got an amazing opportunity to learn about UAVs from the experts. They told us about the problems that they face during actually controlling the drone, aerodynamic effects, how flight stability becomes a major problem. They discussed the various types of location detection methods such as GPS, differential they informed us about the new GPS system developed by India will be available to us by 2018 called NavIC which is officially declared better than US GPS systems by NASA itself. We also discussed our picking and dropping mechanisms with them and they gave us very useful tips about using servos and how to assemble it mechanically to give reliable output. We also discussed about the various GPS shields used in larger drones.

1. INTRODUCTION

Drones are being used nowadays for a variety of applications like surveillances, photography, transportation, research and many more areas and our project makes use of drones for the purpose of lives. Drowning being the reason for third most accidental deaths in the world, inspired us to take measures to prevent this. And thus we came up with the idea of a float dropping mechanism attached to the drone for better speed and accuracy.

1.1 Literature Survey

We have gathered lots of knowledge about the topics related to our project through the literature survey conducted by us. We have visited the following places:

[1] Sayeed Sharma, Baywatch Lifeguard Association, Birla Lane, behind Tulip hotel, Juhu

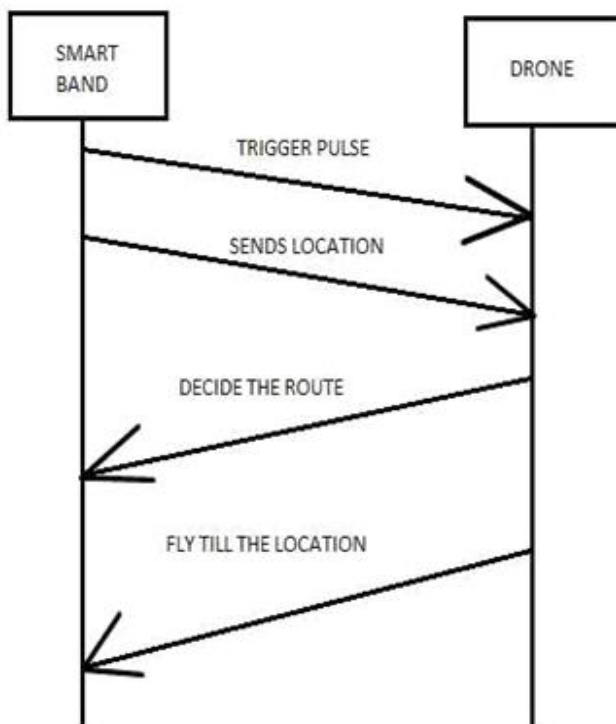
Mr. Sayeed Sharma the founder president of this association guided us with his valuable information. They informed us about the two types of rescue i.e. dry rescue and wet rescue.

1.2 Current system

Currently lifeguards at the bay keep watch over entire beach from the watchtower. The lifeguard at the bay gets maximum 10 minutes to save the victim. As the oceans do not take away the person directly inside but the movements of the ways are back-and-forth so the victim gets enough time to survive in the ocean. Sometimes in the ocean a rip current is present so during that time it becomes difficult even for lifeguard to save the victim. Lifeguards use equipment's like lifejackets, tubes, Jet Ski & floats and for surveillance. Also there are drones which are controlled by the lifeguards but are useful only when the lifeguard detects the drowning person within a stipulated timeline which normally is 1-2mins.

2. Proposed Design

The main objective is to design a system which will provide automated surveillance system to detect and save drowning people using an UAV. The triggering will be given by a smart band or our very own smartphone which is attached to the drowning person's arm that will trigger the drone to get to that drowning person and save them.



2.1 Methodology

In order to get the required result following are the tasks to be performed:

Task 1: Triggering

Basically, at the start the drone will be at stand by or charging mode. To energize the drone, it requires an external

trigger. By pressing the trigger button on the smart band, the drowning person gives the trigger to the drone.

Task 2: Getting the location

After giving the triggering pulse to the drone, the smart band gives the location of the drowning person using GPS module. Now in order to send the location of the person gsm module is required. It will transmit the location to the drone

Task 3: Flight

Once the location of the person is receives to the drone:

- 1) It will take off from its position to a specific height and stabilize there.
- 2) It will track the path to reach the destination.
- 3) After reaching the destination the drone is dropped to a certain height and is stabilized there.

Task 4: Dropping the float

Once the drone is dropped to a certain height it will trigger the servo. The servo opens and it will drop the float in the vicinity of the drowning person.

Summarizing the above methodology once the trigger is given by the drowning person it will energize the drone which is initially in standby mode. The location of the person is transmitted using GSM module. Once the location is received by the drone it will track path to the destination. Initially drone is lifted to a certain height and then after reaching the destination it will drop its height and then triggering the servo the float will be dropped in the vicinity of the drowning person.

3. CONCLUSIONS

Thus our project will be a boon for mankind which will save precious lives and will be handy for the lifeguards on the bay for monitoring and saving lives of the drowning victim and making life in water much less risky especially at private pools and beaches.

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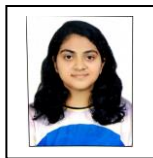
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