Drones in Natural Calamities(Water Calamities)

Team – Pavilion Drone

Team Members –

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DRONE ABSTRACT

There always lies a fine line between win and fail while considering management of disasters. Any calamity, whether natural or otherwise, does not allow for the bonus of time, while being handled. Timely and precise analysis of the situation will lead to better estimation of the resources needed to contain and overcome the calamity. Disaster response and evacuation teams must make decisions that can save countless number of lives immediately. Circumstances that require immediate and effective measures ranges from fires to leakage of toxic or inflammable gases to flood. The disaster management teams must rely on first hand understandings of the affected zone and the data must be highly precise and reliable. To this end, robots and machines are extremely valuable. The tolerance and abilities of machines and automations are very high with the advancement in technology. They can easily venture into unknown and perilous territory where humans cannot. One of the robots having great implementation is the “The DRASB - Disaster Response and Surveillance Bot”, which is both effective and advantageous in terms of use, efficiency, design and cost. Drones have a great application in this sector and comes in handy. It is instrumental in environment and situational analysis during the unfortunate occurrence of a disaster.

INTRODUCTION

Today we have multiple DRONEs made for various different tasks. The World is trying to make drones with cost effective and many more inbuild features in it.DRONEScan be used in various calamities for saving lifes especially during floods. Those victims which are alive but badly injured can loose their lives as finding them by the rescue team manually consumes more time rather if we make use of the DRONEs then we can find them in a short time and the victims would receive the basic necessities such as food,water,first aid ,etc. Afterwards the rescue team will do the rest work.

Aim of this project is to introduce advance DRONE , which is mainly helpful in water disaster .Our DRONE is self programmable which is based on computer vision and there some in built programms which is based on Machine vision. This DRONE is basically water and wind resistant.

IDEA

* Provide basic necessities to victims like water,food,medication
* Give update about heath condition of victim to rescue team to decide rescue preference list
* Try to communicate with victims and within victims to help themselves using transmitter
* Surveillance of the unblocked paths

Material Used in DRONE

* Electronic Speed Controllers (ESC), an electronic circuit that controls a motor’s speed and direction.
* Carbon fiber body with aluminium and brass
* Flight controller
* GPS module
* Battery(3 battery system)
* Antenna
* Receiver
* Cameras 30X optical zoom (low night vison camera and flash light)
* Sensors, including ultrasonic sensors , collision avoidance sensors,visual,thermal sensor ,hyper spectrum,multi spectrum,monocular,
* [Accelerometer](https://whatis.techtarget.com/definition/accelerometer), which measures speed
* Altimeter, which measures altitude
* Quantum **health check** system
* SOS Transmitter

Working of DRONE

A typical drone is made of light composite materials to reduce weight and increase maneuverability. This composite material strength allows basic neccesities of victim to cruise at flooded areas

Drones are equipped with different state of the art technology such as infrared cameras, GPS and laser (consumer, commercial and military UAV). Drones are controlled by remote ground control systems (GSC) and also referred to as a ground cockpit.

An Drone has two parts, the drone itself and the control system.

The nose of the unmanned aerial vehicle is where all the sensors and navigational systems are present. The rest of the body is full of drone technology systems since there is no space required to accommodate humans.

The engineering materials used to build the drone are highly complex composites designed to absorb vibration, which decrease the sound produced. These materials are very light weight.

Using Cameras 30X optical zoom, Drone can find a way in that flooded area.

This Drone have a proper water and wind resistance shield .

Using thermal sensor it can detect victim and send SOS transmitter ,health check system.

Due to health check system Drone get the current health update of victim and send it to rescue team.

Sensors, including ultrasonic sensors , collision avoidance sensors,visual, ,hyper spectrum,multi spectrum,monocular, it can detect proper unblocked path for victims.

Due to SOS transmitter provided by Drones ,victims can communicate between themselves .

Challenges faced

1.Capacity of load which can be carried-People often are unable to estimate the load which can be carried by a drone. Drones which can maximum carry a load of 2kg often get overweighed leading to malfunction.

2.Poor quality of components-The drone eventually fails if the components like the relay, motor etc. are of poor quality.

3.Poor cost estimation-Often the costing of such drones is very high leading to high budgets.

4.Battery problems-As the drone will have to cover longer distances there will obviously be battery problems because drones do not have large battery life.

5.Protection of Drone-As the drone will go to affected area its safety will be a big problem.

Financial Needs

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| Material | Cost |
| SOS Transmitter | 18000 to 20000 Rs |
| Health Check System | 11000 Rs |
| ESC | 450 Rs |
| Flight Controller | 3150 Rs |
| Altimeter | 5000-8000Rs |
| Combined sensors | 10000 Rs |
| Accelerator | 100-500 Rs |
| Batteries | 3000 Rs |
| Water proof Skirt | 10000 RS |
| Propeller | 10000Rs |
| Robotic arm | 8000Rs |
| Total amount :: | 80000 Rs |
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