Drone Assisted Rescue System

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Abstract—**The Drones today are being used in more innovative ways than ever before, and recently drone technology has also become increasingly used to save lives. Over the last year alone at least 65 people were rescued with the assistance of drone technology. Drones are able to provide real-time visual information and imagery to save time and help make better decisions. Since they are electronic and very cheap to operate, drones in search and rescue can cover large areas and provide situational awareness over a large area in a quick way. The project consists of an drone equipped with GPS capable of traveling through mountainous areas, GSM for communication with the central system, and a thermal camera capable that can map and locate people or animals, both day and night. Once the drone has detected a target, the system will send a GSM alert with the location of the person or animal located together with a thermal image.**

I   INTRODUCTION

The demand for aerial drones has largely increased in the recent years due to technological breakthroughs which provided them with more advanced features such as location tracker, multifunctional sensors, and built-in cameras. While popular for their commercial use, aerial drones are also used in researches involving surveillance, military operations, and disaster management. Their compactness and mobility made it possible to carry out tasks that are potentially dangerous to humans. Difficulty in navigation on flooded areas and obstructed routes poses an unfavourable impact on the mortality rate **of disaster victims, which can be improved if** rescue operations system were made more efficient. There is a need for a proactive rescue system that can manage a fast and easy way to traverse and evaluate disaster areas. The research aims to establish a human detection and geolocation modular system that can facilitate search and rescue operations. Drones today are being used in more innovative ways than ever before, and recently drone technology has also become increasingly used to save lives. Over the last year alone at least 65 people were rescued with the assistance of drone technology. Drones can provide real-time visual information and imagery to save time and help to make better decisions. Since they are electronic and very cheap. Drones in search and rescue can cover large areas and provide situational awareness over a large area in a quick way. The project consists of a drone equipped with GPS capable of traveling through mountainous areas and a camera capable that can map and locate people or animals, both day and night. Once the drone has detected a target, the system will send the location of the person or animal located to the rescue team.

II   LITERATURE REVIEW

Drones today are being used in more innovative ways than ever before, and recently drone technology has also become increasingly used to save lives. Over the last year alone at least 65 people were rescued with the assistance of drone technology. Drones can provide real-time visual information and imagery to save time and help to make better decisions. Since they are electronic and very cheap. Drones in search and rescue can cover large areas and provide situational awareness over a large area in a quick way. The project consists of a drone equipped with GPS capable of traveling through mountainous areas and a camera capable that can map and locate people or animals, both day and night. Once the drone has detected a target, the system will send the location of the person or animal located to the rescue team. In this paper[1], the authors discuss the overall architecture for drone assisted disaster management and propose the suitable drone hardware with sensors for practical rescue operation. The system in the lighted and limited lighting conditions, and the sensor outputs visualized by ROS provide the global and local maps of surrounding unknown environments. And identify that laser scanner sensor and depth camera are insensitive to illumination change and thus can be fused together to offer meaningful information at natural disaster sites. Successful usage of these sensors enables rescuers to detect significant landmarks such as doors or boundary walls and find survivors from the disaster at the earliest time.

In this paper[2] the author proposed a technique used for human detection with geolocation programs and video capturing devices attached onto a UAV. The study implemented a structure capable of searching for possible human survivors in areas affected by disaster. The study produced a modular equipment consisting of two cameras and a geolocation module mounted on a UAV. The higher accuracy reflected by the thermal sensor at night time proved the thermal detection works best when used during night operations. On the other hand, the data implied that optical detection effectively operates during daytime, having a higher accuracy at daytime deployment in comparison to night time. The success of the geolocation capability was measured by the 10-meter detection radius wherein all the test samples within the scope were detected.

III   METHODOLOGY

We are using a drone equipped with raspberry pi GPS module, Digital camera to recognize humans in a flooded

area by means of image processing technique. The Human detection is done by Haar Cascade algorithm. The drone will send its location which is near to the human. The drone can be manually operated by the technicians, with the help of an Infrared Wireless Remote. with the help of this location the rescue officials can locate the area where rescue operation is to be conducted. The search time is reduced and more lives can be saved.

IV   RESULT

Fig 1: Design of Drone and Flight Testing

Fig 2: Human Detection using Haar Cascade Algorithm

V   FUTURE WORK AND CONCLUSION

In this project search and rescue operations can make use of drones for a fair amount of activities. The detecting and tracking people from aerial image sequences is shown in this project. The proposed architecture intends to provide communication over disaster areas and scan the region to provide useful information. The future work will focus on building a fully autonomous drone that can perform sensing, localization, and trajectory planning on its own. The success of the geolocation capability was measured by the 10- meter detection radius where in all the test samples within the scope were detected.

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