Name(s)

Abha Pandey

Project Number

S0925

Project Title

Rapid First Response by Creating a Rescue UAV to Locate Trapped Earthquake Victims

Abstract

Objectives/Goals

To be able to detect and reveal a trapped earthquake victim#s location to local rescuers through a Unmanned Aerial Vehicle(UAV).

Methods/Materials

I used a pre-built UAV from Hobby King. In order to test if the UAV was compatible with the Arduino, I did a series of motor tests through PWM ports. The speed was about 100 ticks per second. I used an ultrasonic #ping#, and a passive infrared sensor. The UAV was controlled using an Arduino Uno board after several attempts of using numerous Arduino boards. I coded the program through Arduino IDE, and I set the maximum height of the drone to about 4 feet with the obstacle set about 5 feet away from the wall. I had the UAV fly for about 5 minutes and in that time frame, I checked if the UAV was successfully able to detect the #human.#

Results

The servo motor#s speed had to be constantly adjusted in order to make sure the UAV would not have to crash. The reason why was because at 100 ticks it felt it was too fast and the UAV might go higher than expected. Another problem with the UAV was battery efficiency, after two tests, the batteries would drain out. Overall, the UAV was successfully able to find the obstacle in 5 minutes. However, during the flight, because of a slight imbalance in the propellers, the UAV was wobbly during the flight. It was able to find it through the ping sensor and the passive sensor.

Conclusions/Discussion

The UAV was successfully able to find the obstacle and it worked exactly how I planned it out. For improving this project, a few factors for consideration are having better battery efficiency, a microcontroller that can handle the power of the battery, and a way to make the UAV smaller to help it go through the cracks in a realistic situation of an earthquake.

Summary Statement

This project is used to find trapped earthquake victims through a UAV,

Help Received

My mother timed the flight duration of the UAV.