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Robot for Rescue Operation

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***Abstract*: Robot rescuers to help save lives after disasters. Robots could scour avalanche sites, enter burning buildings or secure city streets contaminated by poisonous chemicals, saving lives and increasing the effectiveness of rescue missions. Scientific advances in robotics research are moving the technology from predictable spaces like production lines into disaster zones. After earthquakes, accidents, avalanches or explosions, robots can take the place of their human teammates, cutting risk to human life and helping boost the chances of rescuing victims. To be most useful in a disaster situation, robots need to work hand in hand with humans. In the case of an avalanche, robots could scour the skies and the hillside, leaving a human rescuer to think strategically.**

Keywords: Arduino UNO, Easy navigation, Robotic movements, Sensors, Robot, Power Supply, Battery, Switches.

I. INTRODUCTION

An embedded system can be defined as a computing device that does a specific focused job. Appliances such as the air-conditioner, VCD player, DVD player, printer, fax machine, mobile phone etc. are examples of embedded systems. Each of these applianceswill have a processor and special hardware to meet the specific requirement of the application along with the embedded software that is executed by the processor for meeting that specific requirement. The embedded software is also called “firm ware”. Thedesktop/laptop computer is a general-purpose computer. You can use it for a variety of applications such as playing games, word processing, accounting, software developmentand so on.

II. OBJECTIVE

The main objective of our paper is to save the lives after disaster. If any fire accidents or gas leakages will happen, we will send robot there, and robot will check the conditions of surrounding places. We will visualise the condition from remote area through android mobile. This paper involves the design of a robot that can localize itself in known environment but the unknown location, find the victims and get them to safe zones.[7] The paper aims to design an autonomous robot able to search the victims and rescue them to safe places if natural calamity hits the country.[7]

III. LITERATURE SURVEY

According to previous literature by P. Velraj Kumar et al., their robot was control by using C compiler program. DC89C450 8051 type microcontroller is used to drive this robot. HEX file was generated. Algorithm for controller and for driver control is created. User interface for controller is also designed with a more streamlined design and understandable for first time user.

Harshit Gulati et al. from Birla Institute of Technology and Science, Pilani, Hyderabad Campus stated that they controlled their robot wirelessly by using Bluetooth technology. Therefore, an Arduino Bluetooth Shield was installed to their robot. The reason they are using Arduino Bluetooth Shield is because it can be program with the same IDE which microcontroller was program. The reason they choose Bluetooth technology is because it has many advantages. Among the advantages is low power consumption, two-way communication, availability and compact in size’.

According to a Changlong Ye et al., proposed a snake-like robot structure that can satisfy all the requirements when dealing with collapsed building environment. It can move fast in wide space and can also climb stairs. They have upgraded previous design by equipping the robot with track drive, which allow the robot to change shape.

IV. IMPLEMENTATION

Arduino is a tool for making computers that can sense and control more of the physical world than your desktop computer. It's an open-source physical computing platform based on a simple microcontroller board, and a development environment for writing software for the board. The components that are used in the project are gas sensor, fire sensor, relay, pir sensor, buzzer, battery, RF module, motors.

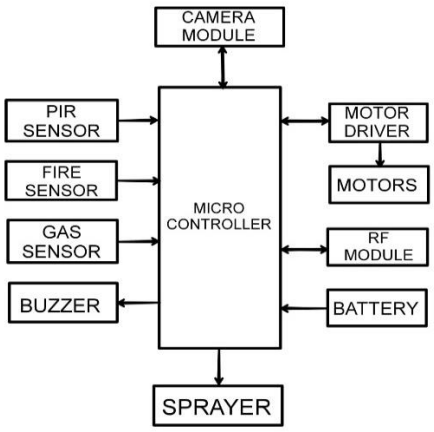

Fig 1: Block Diagram

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First, we have to check the Arduino whether it is working or not. The Arduino board consists of 2 LED'S those are RED and GREEN, if the GREEN led is ON then Arduino board is working properly or else it's not working properly. Then we have to connect each sensor to the Arduino board Connect the PIR sensor to the pin 2 of Arduino board. Connect the GAS sensor to the pin 3 of Arduino board. Connect the FIRE sensor to the pin 4 of Arduino board. Relay is the device, it acts like as a switch, Relay consist of two channels having inputs I1, I2, I3, I4. If the inputs I1, I2 are shorted then we get Output as HIGH If the inputs I1, I2 are OPENED then we get Output as LOW. Connect a power supply(12v) to the Arduino board.

Dump the program into the Arduino board which related to our project. When flame or fire is detected then relay 1 and 2 is ON. When Gas is detected then relay 2 is ON. When PIR is detected then relay 1 is ON. Here we monitor the disaster places through camera by using hi-focus app. The motor consists of 4 wheels (M1, M2, M3, M4) in which 2 wheels are connected to LM293 motor of one pin and another 2 wheels are connected to another pin of LM293If m1 and m2 are high then the motor will move in front direction. If m1 is high and m2 is low then the motor will move in right direction. If m1 is low and m2 is high then the motor will move in left direction.

V. RESULT

Fig 2: Front View of Proposed Prototype

CONCLUSION

Here we were successful in developing a prototype of a compact and affordable surveillance rescue robot for search and rescue operations. The current functions of the robot include real-time video streaming were acceptable for basic search and rescue operations. Here we use the transmitter and receiver for the camera and remote-control system to reach a disaster places. We improve our previous robot for searching in wide-range area like a whole building.[3]

FUTURE SCOPE

In this project, we are using only buzzer for indication purpose.in the future, we want to calculate how much amount of gas leakage happens. Then the information will be directly sent to the rescue team to their lives.

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