Android Operated Human Detection Robot

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Abstract:

Disaster sites may be complex and hazardous to be reached for rescue and there are a great threat and risk linked to rescue workers and survivors trapped in such accidental sites. These disasters can disrupt economic and social balance of the society and this can be categorized into natural and human induced disasters. Natural disasters include floods, storms, cyclones, bush fire earthquakes etc. Whereas human induced disasters include bomb explosion, transportation accidents, industrial accidents, major fires, bridgecollapse, buildingcollapsed. Hence in this project, we focus on a system named as, android operated human detection robot. Which will work in disaster environments of manmade structures like collapsed buildings, war fields etc. It can be assisted for firemen, police, and disaster agencies with appropriate reconnaissance, site evaluation, human detection etc.The advent of new high-speed technology and the growing computer capacity provided realistic opportunity for new robot controls and realization of new methods of control theory. This technical improvement together with the need for high performance robots created faster, more accurate and more intelligent robots using new robots control devices, new drives and advanced control algorithms .

I.INTRODUCTION

To function in a manner our system contains PIR sensor, sound sensor, proximity sensor and temperature sensor. The main purpose of our project is to detect the human whom are buried inside the buildings .firstly our robot read the data from all the sensors then all the data send to the µcAtmega328 that human is detected through Bluetooth module (HC05).

Once the people are located it immediately gives visual alert to android app to the authorities so that they can help to reach the live person very fast. This PIR sensor is placed on a moving all direction robot that can move in the earthquake prone areas. The robot is driven on a geared dc motor for increased torque and low speed and stepper motor for increased turning accuracy hence the precise control of position is monitored. The robot consists of a three wheel geared drive with DC motors attached to perform forward and reverse movement as well as left and right. Detection by rescue workers is time consuming; therefore here we are using the robot for earthquake rescue operation.
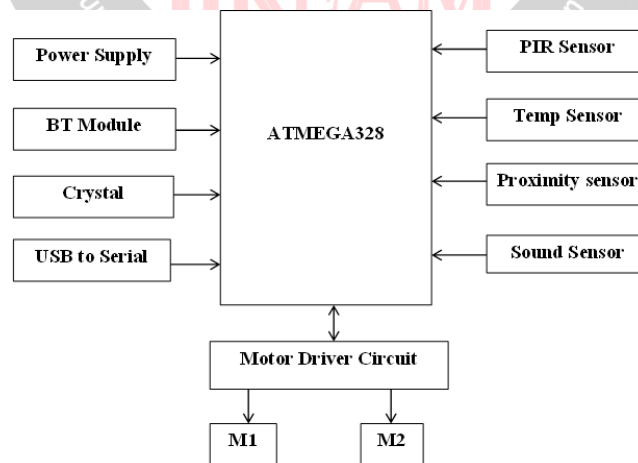
II.BLOCK DIAGRAM:

Fig. 1 block diagram

Algorithm

1. Start.
2. Initialize the system.

3. Read the data from all sensors.

4. Scan all sensor is signal detected or not.

5. Send the data to microcontroller.

6. Send data to BT module.

7. Serial data to app.

8. Stop

The Robot has two sides, receiver side and the transmitter side. The transmitter side consists of ATMEGA328 microcontroller (Adriano Uno); the inputs to the microcontroller are PIR sensor, sound sensor, laser sensor, and temperature sensor. The output is L293D motor drive module, to which a DC motor is connected. A DC motor is used to move the robot in left, right and forward and backward directions. L293D motor drive module controls the DC motor to move in the direction. The L293D devices are quadruple high-current half-H drivers. The L293 is designed to provide bidirectional drive currents of up to 1 A at voltages from 4.5 V to 36 V. this device is designed to drive inductive loads such DC and bipolar stepping motors, as well as other high-current/high-voltage loads in positive supply applications.

The direction of movement is decided from the signals given by all the sensors. PIR sensor uses infrared signal to find if there are any human present in front of it, its range is up to 20ft (6m). A PIR sensor is a sensor that produces passive infrared signals, these signals can detect heat. Human being produces heat which is detected using this sensor. Human being produces 9 to 10 microns of heat. A PIR sensor's angle of detection is restricted to 180o i.e. except the area below the robot it can sense in all the other direction. As the sensor's range is less, the sensor is mounted to a robot that can move automatically. If the sensor detects the human, it sends the signal to the Bluetooth module (HC05).**The LM35** is a precision IC temperature sensor with its output proportional to the temperature (in oC). With **LM35**, temperature can be measured more accurately than with a thermistor. Sound sensor module is a very easy to use Sound Detection Sensor module. The Sound Sensor module has on-board Microphone for sound detection and it has two outputs: Analog Output which is a real time output voltage signal of the microphone. And digital Output where the output pin is high or Low and depends on the sound intensity. Proximity sensor modules are designed for movement detection, like intruder alarms, occupancy modules and other innovative ideas. This module is ideally suitable for false alarms reduction in intruder detectors when work together with Passive Infrared (PIR) sensor. All the data send to the µcAtmega328 that human is detected through Bluetooth module (HC05) this module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup.Atmega328 is a high performance 8-bit AVR RISC microcontroller. It consists of a 32KB ISP flash memory, and it also consists of a read while write capability. Once the people are located it immediately gives visual alerts on android app to the authorities so that they can help to reach the live person very fast.
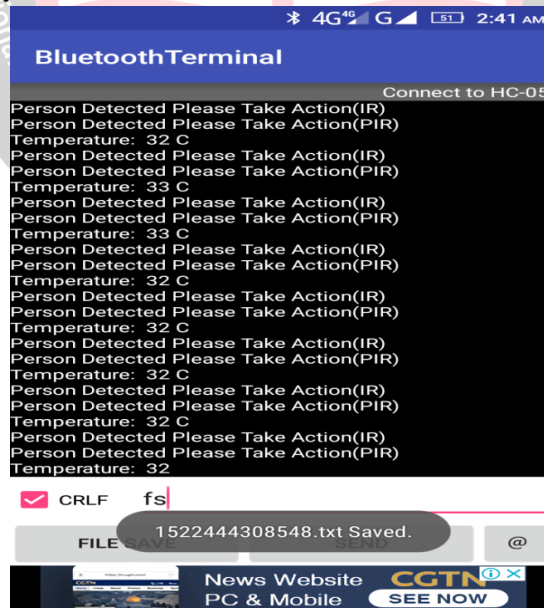

Fig. 2 Android app data

Fig.3 Hardware Module

III.CONCLUSION

In this project, we have introduced our primitive idea to make rescue robot using some type of primitive sensors like PIR. This may be improved by using high range sensor and motor of high capacity. The proposed system will find exact location of human buried under debris which will help to rescue them without wasting energy and time

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