

Human Detection Robot

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Abstract

This paper aims to give a realistic design to fabricate the first and simplified version of a rescue robot which has to be active within disaster areas like distorted buildings. Human detection for rescue purpose is carried out by humans but it will better to utilize some high tech equipment to achieve the mission quickly and efficiently. It can operate virtually at any place, and can climb over small barriers and fit into small holes...

Keywords; Robot, Disaster, Microcontroller based robot

I. INTRODUCTION

Many people get trapped under debris for hours due to disasters that is caused by natural calamities. It is because their presence cannot be detected by rescue teams easily which lead to painful deaths. As mentioned earlier the main aim of this project is to design the device that overcomes the difficulties faced by the people like prevention of theft of valuable properties due to failure of CCTV cameras, helping soldiers in war field. It communicates the most powerful and crucial points that are drawn by the robot [1].

The Microcontroller based robot involves perfect construction of electronics and communication arrangement to save the humans community. The whole process includes Image processing which consists of camera and microcontroller which is based on electronics where wireless communications are used in commanding the robot action. So this set up as a whole will act accordingly to the users decisions [2][3]. Here devices is also used which senses the humans by their image capturing and it forms the important part of this project. This project is a combination of software and hardware components. The main objectives are

- To detect humans in need of help who are unable to move in disaster occurred areas.
- To develop a Robot with camera that can communicate through wireless signals

II. PROPOSED HUMAN DETECTION ROBOT

The block diagram of human detection robot is shown in Fig.1. The whole block is a well-equipped system comprising of camera with USB interface, raspberry pi with memory card which captures the image and process it.

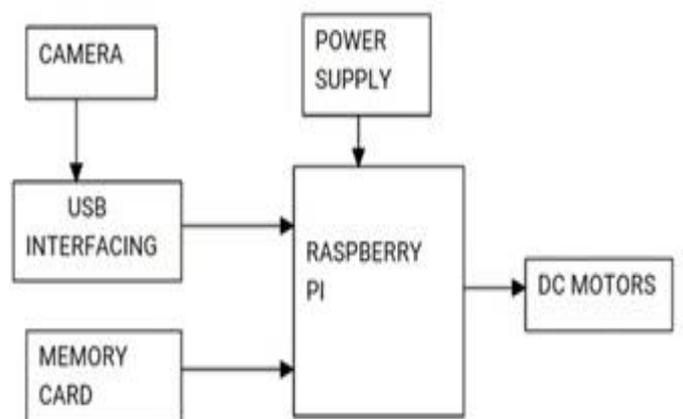


Fig.1. Block diagram of Human Detection Robot

The block diagram gives the details where the raspberry pi powered by power supply with camera

interfaced along with it. Once the human image was detected the motor stops and the information will be displayed in the output window. Raspberry pi used in the applications in which the image processing is involved.

The camera with 720p HD resolution offers image that are 1280 x 720 pixels and 1080p HD cameras offer 1920 x 1080-pixel resolution, or 2.1 megapixels. A USB was intended to regulate the connection of peripherals like keyboards, digital still, disk drives, video cameras. It has largely restored interfaces such as serial ports and parallel ports, and has become routine on a wide range of device [4].

A memory card is an electronic flash memory data storage device used for storing digital information. These are commonly used in portable electronic devices, such as digital cameras, laptop computers, tablets, portable media players, video game consoles, synthesizers and pianos [5].

A motor driver IC is an incorporated circuit chip which is used to control motors in independent robots. Motor driver ICs act as an crossing point between microprocessors and motors. The mostly used motor driver IC's are from the L293 series such as L293D, L293NE, etc.

A DC motor is an electrical machine which converts electrical energy into mechanical energy. In the DC motor forces produced by interaction between two magnetic fields. Nearly all types of DC motors have some internal mechanism to every so often change the way of current flow in part of the motor.

III. HARDWARE IMPLEMENTATION AND RESULTS

This project deals with live personal detection robot is based on microcontroller. The Fig.2 shows the circuit where camera is interfaced with raspberry pi through an USB. The robot follows commands given from the PC. The Camera detects the live human beings who are in need of rescue during natural disasters. All the above systems are

controlled by the microcontroller. This technical improvement makes the project more accurate and intelligent.

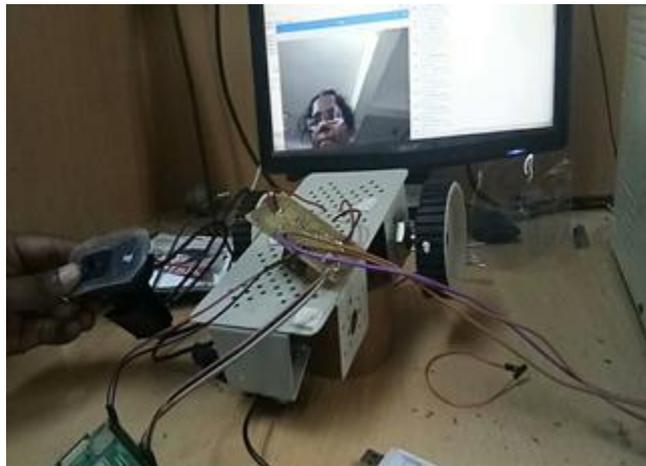


Fig.2. Working model of proposed system.

This project entirely controlled by RASPBERRY PI microcontroller. It is used to control the motor which gets the signal from the camera and drives the motors according to the input. The arrival of new high-speed technology and the emergent computer capacity provides pragmatic opportunities for new robot controls and recognition of new schemes of control theory. Thus the new drives, DC motors and advanced control algorithms are used to drive the robot.

The control algorithm which is used to drive the robot is shown in Fig.3. The first work is to initialize the microcontroller, then initialize the motor and finally the camera. The Fig.3 Flow chart of Human Detection Robot which shows the steps involved from initializing the microcontroller to camera processing the human's image.

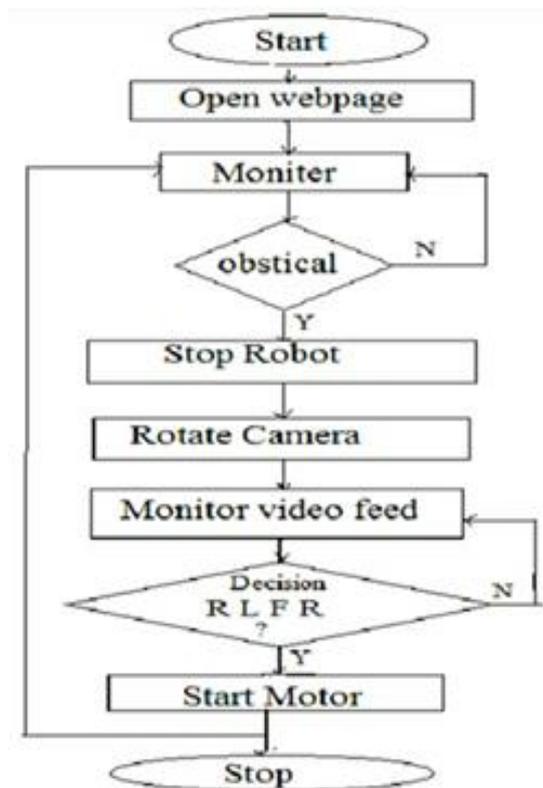


Fig.3. Flow chart of Human Detection Robot

Open the web page and start monitoring humans through camera. Once the human is detected then the motor stops and the information will be displayed in the output window. If not the motor continues to rotate in specified direction as per users command.

IV. CONCLUSION

Thus the Human Detection Robot is found to be very helpful in saving the human lives from earthquake. The future scope of this project can be extended to increase the distance of communication and converted to drone which is more suitable and compact to enhance the efficiency.

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