

HUMAN DETECTOR IN DISASTER MANAGEMENT

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ABSTRACT

The world repetitively suffer from disaster condition like earthquake, gas tragedies and if want to survive we want to take helps from technology because it's very dangerous to come directly face these type of situations so that's why we are focusing on a robot who can make the task easier so human detector plays that kind of role it finds a person in certain areas where risk is there and alarms us if any person detected. Passive Infrared Sensors (PIR) are the most widely used sensors for cheap surveillance. Due to their high ended sensitivity and area of detection PIR sensors are popular in security. PIR sensors are excellent in human and animal detection. They are mostly used in triggering an intruder alarm and activating household appliances in the presence of a human. However, the output from the sensor is proportional to several temporal relationships between an object in the field of view of the sensor, the sensitivity of the sensor, PIR lens features, and the environmental heat conditions.

Keywords: Pir Sensor, Aurdino Uno, Buzzer, Avoidance Sensor, Jumper Sensor, Servo Motor.

I. INTRODUCTION

This system was designed as a mobile rescue robotic system to help people on time who are trapped in the natural calamity like disasters, earthquakes, floods, leakage of gas, etc. It gives immediate and accurate information about the human who is in the disaster region so that the rescue team of expert

and the doctor can be sent to the victim's primary treatment or take that person to a safe place or hospital. This entire process is done in a few minutes, the main aim to implement this project is, when a disaster happens forex. The landscape then humans can't go in that region to rescue other people so instead of using humans, we can use this robot who can easily find the human send us the signal. We are using hear various types of sensors that work independently. When a human is in the danger it emits thermal radiation and that radiation is received and manipulated by the sensor. This robot decides its path of traveling itself and if any obstacle comes in between the path it can sense by the sensor and according to that, it changes its direction. When the human body comes in front of the robot it makes a sound and passes a message to the sensor.

II. MICROCONTROLLER BOARD-ARDUINO



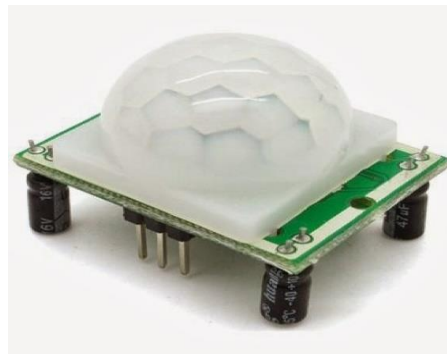
The Arduino UNO is an open-source microcontroller board on the microchip ATmega328P microcontroller and developed by Arduino 14 digital input/output pin. Arduino is programmed to guide the robot automatically depending on the obstacle detected and to send the human being information to a remote control place through Bluetooth technology. Arduino Uno checks the logic level on the sensor's output pin and performs further tasks such as activating the buzzer and led, sending alert messages, etc. Arduino boards can read inputs and turn them into output. It is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board.

III. PIR SENSOR

PIR sensors are more complicated than many other sensors because multiple variables affect the sensor's input and output. PIR sensors are passive infrared sensors that detect the movement of people with the help of

changes in infrared levels emitted by surrounding objects. The human body emits thermal radiation at a wavelength of about 10 microns. It is received and manipulated by the PIR sensor to detect. PIR sensors allow you to sense motion. They are small, inexpensive, low-power, easy to use, and don't wear out. For that reason, they are commonly found in appliances and gadgets used in homes or businesses. Passive infrared alarms are classified into infrared detector and alarm control sections. PIR is made of a pyroelectric sensor, which can detect the different levels of infrared

Radiation. Passive infrared alarms are classified into infrared detectors and the alarm control section. The most widely used infrared detector is pyroelectric. It uses as a sensor for converting human infrared radiation into electricity.

**PIR SENSOR**

IV. AVOIDANCE SENSOR

Obstacle detection (IR sensor) output signal sends to the microcontroller. The microcontroller controls the movement by using a DC motor which is placed in the project. Placed inline the IR sensor fails to receive the light ray and gives a signal to the microcontroller. Because of this sensor, when an obstacle comes in front of the robot in that situation, the robot takes some time and searches in both left and right positions, and then it takes to design and change the direction automatically.



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VI. GEAR MOTOR



A gear motor is an all-in-one combination of a motor and gearbox. The addition of a gear head to a motor reduces the speed while increasing the torque output. DC motor is a rotating electrical device that converts the direct current, of electric energy into mechanical energy.

VII. BUZZER

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical use of buzzers and beepers includes alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.



❖ **BLOCK DIAGRAM:**

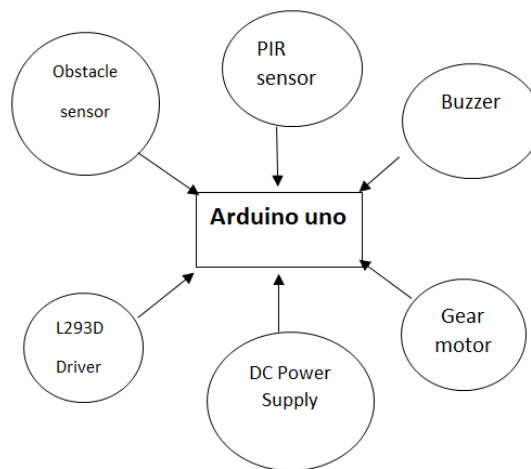


Fig: Block diagram of human detector robot:

The main component of this project is Arduino Uno. This device is a software tool. In this device, we can control the hardware by using programming. we provide a 12v lithium-ion battery to the Arduino to control the dc motor we are using an L293D motor driver which is connected to Arduino and DC motor we are providing a 12v power supply. 4DC motors are connected to the driver. We are using a PIR sensor that has 3 terminals, one terminal is grounded, the second terminal is connected to VCC and the remaining signal terminal is connected to the digital pin2 of an Arduino. The buzzer has two terminals one is connected to digital pin no.13 and the other is grounded. The avoidance sensor has 4 terminals. It's used to determine the distance between object and detector.

❖ **ADVANTAGE:**

- The main application of this project is to save the lives of humans during natural calamities.
- This can also be used to detect the humans in the war field.
- This can be used for security purposes in jewelry shops, museums, etc.
- It holds a great advantage over others because the PIR sensor sensors help detect human radiation emitting from a live human being.

❖ **FUTURE SCOPE:**

The robot may also include a bomb disposal kit To defuse the bomb on the war field. By including PIR sensors, it can also detect human motion near robots or the area under consideration. We can also include voice recognition technology in the future, which can give commands to the robot.

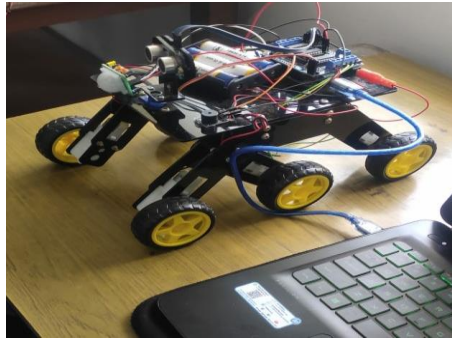


Fig: Hardware representation.

VIII. WORKING PRINCIPLE

- **Principle:** The main principle used in this project is the 'circuit principle'. The circuit is to detect the human using a detection sensor. The wireless technology used here is radiofrequency technology. The data is transmitted to the receiver through RF. using the received data, the robot is operated and controlled.
- **Working:** In a disaster condition when the rescue team If we can't go to that place, we can use this robot and rescue that person. When it starts Arduino gives a signal to the motor and sensor, then the motor gets started and the robot starts walking. After the start, all the sensors are activated and start working. The obstacle sensor starts detecting the object there are two different conditions one is the when the obstacle sensor start finding the object then it's it might be possible to detect any obstacle in way of finding the people, then it gives a signal to the Arduino, and then Arduino change the direction of the motor. In the other case when any the obstacle is not found in his way it works continuously. PIR sensor starts detecting the humans who are trapped in a disaster. There are also two conditions positive and negative. If the PIR sensor can't find any human, it continuously searches the human. If a human is found out, then the PIR sensor sends a signal to the Arduino. After receiving the signal from the sensors it makes a buzzer, and the robot is automatically stopped. Then rescue team can go to that place and save that person.

IX. CONCLUSION

A simple, efficient solution for helping rescue workers in disaster management. As it is a wired robot, it has its limitations. PIR sensors can detect radiation only from living persons etc. This prototype can be further enhanced by making it wireless using Bluetooth or Wi-Fi technology, an infrared camera can be used for visualizing the entire situation before entering the area. This robot can be further integrated with a software application. This solution is very reliable, safe, easy to operate, and cost-effective. Periodic maintenance is not required.

❖ OUTPUT:



X. REFERENCE

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