Microcontroller based Human Detection Robot

Ms.A.K. KAVITHA[1], M. KEERTHANAH[2], K.B. BHAVYA[3], J. JANANI[4]

[1]Assistant Professor, Dept. of Electronics and Communication Engineering, TamilNadu, India

[2,3,4]UGStudent, Dept. of E lectronics and Communication Engineering, TamilNadu, India

---***---

Abstract –_The project's goal is to provide a practical design for the first and most basic form of a rescue robot, which will be used in disaster situations such as damaged buildings where rescue teams are unable to function due to a variety of technological issues. Human detection for rescue purposes is typically done by humans, but when there is a risk of collapse or a hazardous environment, it is better to use high-tech equipment to complete the task successfully._

**Key Words:** **Arduino UNO, PIR Sensor, DC Gear motor, Power Supply** are some of the terms used in the paper.

1. INTRODUCTION

Nowadays, most people's city area units are developing faster, resulting in a massive increase in population. Because of the high population growth, each natural disaster, becomes a more powerful accident. Indeed, the disaster has the potential to destroy several infrastructure qualities and make the rescue groups less responsible and effective. The rescue crews and hostages within the disaster are at risk due to the complicated and dangerous nature of those unintentional sites. Different procedures and strategies can be used to detect the presence of humans. The advancement of technology, combined with the demand for best robot performance resulted in the development of several of the new robot management devices and advanced management algorithms. The concept is based on the identification of live humans and is powered by an 8-bit microcontroller and a passive sensor.

2.EXISTINGSYSTEM

In the existing technology, the most important goal of this research was to create a useful that could be controlled by computer using existing technologies such as wireless Zigbee technology interfaced with microcontroller 8051. The Zigbee interface navigates around disaster zones and tries to locate people who need assistance. This procedure is incredibly cost-effective.

3. PROPOSEDSYSTEM

The proposed model system will be a hybrid of a stationary and mobile system, with a focus on disaster-affected areas. It will travel in all directions specified by each laptop, and the devices are also mechanical, making the system easier to use. Because it moves, covers a great deal of ground, reducing the need for multiple robots or sensors.
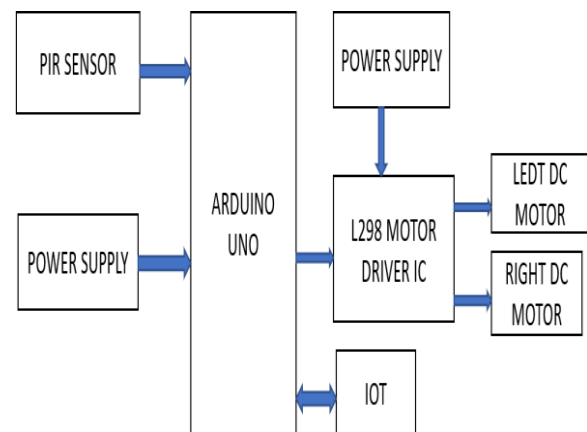

Fig1: BlockDiagram

A live personal detection robot is based on an 8-bit microcontroller within that model. Human detection with a PIR sensor, the motors are controlled by an 8-bit microcontroller. The signal from the PIR sensors is received, and the motors are driven in accordance with the sensor inputs. The robot is driven by two DC gear motors. The power supply is used to supply electricity to the device's other modules.
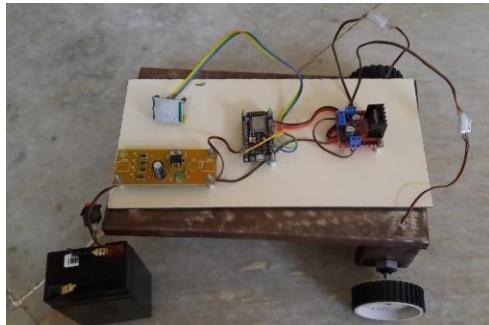
4.   EXPERIMENTAL SETUP

Fig-2: External Structure Model

The proposed methodology made up of the following sections

1.ARDUINO UNO: The ARDUINO UNO is used to connect the device's software and hardware components. It has a significant impact. It obtains the data from the processor. It compares the receiver data and generates the output accordingly.

2.PIR SENSOR: The Passive Infrared (PIR) sensor is a key component of the circuit that detects human beings. Within a 11-feet range, it can detect a human. PIR sensors are utilised in a variety of applications, including vision, motion detection, and optical device location.

3.Wi-Fi MODULE: The information available from the Arduino is communicated to the user via this Wi-Fi module.

4.ROBOT CHASSIS: The chassis is the structural portion of the robot that includes the drivetrain and allows it to move around on wheels or tank treads. A robot's chassis can hold DC motors, batteries, electronics, mounting supports, and other components. The robot's frame capacity of the electrical motors is frequently referred to as a chassis.

5. DC GEAR MOTOR: An electric motor with a gear train is known as a DC gear motor. It may operate on either AC or DC power. It aids in lowering the shaft speed and increasing the motor's torque output.

6.   RESULTS AND DISCUSSION

In this research, microcontroller technology is used to construct a human detecting system using a robot. The findings have been taken after the modules have been executed. In the mobile application, the Human Detection is displayed as a result. The mechanism must be tested in a confined area with limited exposure to daylight. The primary examination will be completed. The second step is to examine the boundary conditions by maintaining the

robot between 11 and 12 feet away from the human and observing the ranges and position. The project's final conclusion is that because the robot can move, it can cover a large area, reducing the need for numerous sensors. When the Robot detects a human using the mobile app, it can alert the users by emitting a series of beeps.
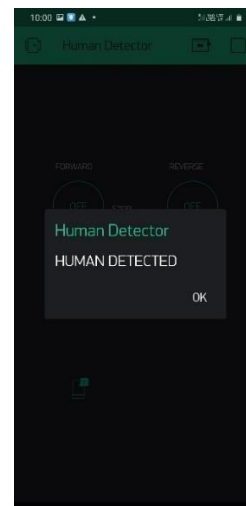

Fig 3: Blynk App

Fig 4: Human is detected

7.CONCLUSIONS

According to the hardware components, the prototype for human detection robot functions properly. The basic principle is represented by the design, in which the robot estimates obstacles and moves in accordance with the passage. As the robot moves, it covers a large amount of ground, reducing

the need for numerous sensors. . It will be simple to save large groups of people at catastrophe areas with this technology. The approach is a simple and cost- effective way to detect humans. This will also be utilised to detect humans in the field of battle, as well as for security at jeweller stores, museums, and other places. Both the PC and the remote will control the robot's movement.

REFERENCES

[1] "IoT Based Rescue Robot for Alive Human Detection and Health Monitoring System" 2020

[2] U. B. Himmelsbach, T.M. Wendt and M. Lai, 2018"Towards Safe Speed and Separation Monitoring in Human-Robot Collaboration with 3D-Time-of-Flight Cameras".

[3] M. S. Nagakanya Lakshmi, S. Sridhar, M. Navya, G. V. V. Saikiran, B. Swathi and D. Mohan Krishna.(2017). "Human detection and tracking via radar module robot" in international journal of innovative research in computer and communication engineering

[4] Swapna and K. Archana.(2017). "A new approach for detecting living human beings in devastating environments using a low cost autonomous robot" in International research journal of engineering and technology.

[5] Prof. Aruna .Y. V, Vidya Singh .G, Sahaja Ramanadham, 2017 "DTMF Controlled Enemy Detecting Robot for Border Security with Live Video Transmission," International Journal of Engineering Science and Computing.

[6] Premangshu Chanda, PallabKanti Mukherjee, Subrata Modak, Asoke Nath, "Gesture Controlled Robot using Arduino and Android", 2016 International Journal of Advanced Research in Computer Science and Software Engineering.

[7] MugahedGhaleb, Design of an Obstacle-avoiding

Maharashtra, India 2019,"Alive Human Detection

Robot Car Based on Arduino Microcontroller,JUNE 2018.

[8] ArkhaprabhaLodh, Debopama Ghosh, Debosama Ghosh, "Accelerometer and Arduino based Gesture Controlled Robocar", 2018 International Journal of Innovative Research in Science, Engineering and Technology

[9] Kunal Swami, Prof.D.G. Agrawal PG Student [ECE], Dept. of Electronics and Telecommunication Engg. SSGB College of Engineering & Technology, Bhusawal, Maharashtra, India1 Professor, Dept. of Electronics and Telecommunication Engg. SSGB College of Engineering & Technology, Bhusawal, Maharashtra, India 2019,"Alive Human Detection Robot for War and Rescue Operation

[10] Yuki Yamazaki, Masaya Tamaki, C. Premachandra,

C. J. Perera, S. Sumathipala, B.H Sudantha, 2019 "Victim Detection using UAV with Onboard Voice Recognition System".

[11] Kunal Swami, Prof.D.G. Agrawal PG Student [ECE], Dept. of Electronics and Telecommunication Engg. SSGB College of Engineering & Technology, Bhusawal, Maharashtra, India1 Professor, Dept. of Electronics and Telecommunication Engg. SSGB College of Engineering & Technology, Bhusawal, Robot for War and Rescue Operation**"**

[12] Gopika D, Hrithik Sivadasan, Pooja Jiresh, Sucheta G S B M S College of Engineering Bangalore,India S Y Pattar Associate Professor, BMS College of Engineering Bangalore, India 2021 "Human Detection Robot for Disaster Management".