International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

MILITARY PURPOSE ROBOT USING IOT

[1]M.Kranthi Kumar , [2]K.Abhilash, [3]Y.Rajasekhar Reddy [4]V.Satyavardhan Rao
[1,2,3&4]Department of Electrical and Electronics Engineering
Mother Teresa Institute of Science & Technology, Sathupally, India.

ABSTRACT

A new approach for detecting alive humans in destructed environments using an autonomous robot is proposed. Human detection in an unmanned area can be done only by an automated system. Alive human body detection system proposed a monitoring system using ultrasonic sensors and camera to record, transmit and analyze conditions of human body. The task of identify human being in rescue operations is difficult for the robotic agent but it is simple for the human agent. To detect a human body, an autonomous robot must be equipped with a specific set of sensors that provide information about the presence of a person in the environment around. This work describes an autonomous robot for rescue operations. The proposed system uses an ultrasonic sensor to detect the existence of living humans and a low-cost camera to acquire a video of the scene as needed.The video is then displayed on the screen. This approach requires a relatively small number of data to be acquired and processed during the rescue operation. This way, the real-time cost of processing and data transmission is considerably reduced. This system has the potential to achieve high performance in detecting alive humans in devastated environments relatively quickly and cost-effectively. The detection depending on several factors such as the body position and the light intensity of the scene. Results show that the system provides an efficient way to track human motion. The aim of this article is to present our experience with various sensors designed and developed and the developed software is used on the network server

.

1. INTRODUCTION ABOUT MILITARY PUROSE ROBOT USING IoT

1.1 INTRODUCTION:

In today's world the monitoring of military areas is essential due to increased attacks of the enemies but the quality of that monitoring i.e., surveillance is not that much satisfactory, this results in the increasing ratio of lives of the soldier in danger. Because of that it is necessary to improve the quality of surveillance through effective surveillance. This is done more effectively by high quality video transmission. In this project the quality of video is improved using Closed Circuit Cameras. For all this there is a need of the ground Robot, which is able to move on the hills, muddy areas. By using Closed Circuit Cameras various technical advancements are took placed in surveillance [1]. Lots of crime scenes have been solved by using this technology but still, the crime rate has not reduced because of immobility of the surveillance equipment's. In this project design and development of the robot is done which will move from one place to another, it has capability of capturing real-time images and videos required for the surveillance.

The main constraint in surveillance is mobility of the robot. This robot is also capable of doing housekeeping. And also, the water sprinkler made under this project, and we can operate a robot there is no need for human to go even near the area on fire. We have used the light dependent resistors for detection of fire. It is the highly sensitive device and is capable for detecting very small fires too. The

robot accommodates a water tank and sprinkler on itself to extinguish fire. Further, the system proposed is interactive in nature, hence the user even while grooming up, can give voice commands, to get required and related information on screen, keeping European Journal of Molecular & Clinical Medicine ISSN 2515-8260 Volume 07, Issue 01, 2020 4201 his/her hand free. There are related products available in market, but the main difference lies in the usability of the product. The available products are mostly passive in nature with little interactivity. The present Smart mirrors designed so far are almost passive in nature. These systems can display the information on the screen. They have been designedmostlywith Node MCU, L298N Motor Driver, Printed Circuit Board (PCB). Few of them workon either voicebased commands or Touch Commands or Mobile device commands. Some of thesystems are also designed for providing security using PIR sensors. But the systems thus designedhave more false alarm rate and sensing range is also very low. The proposed system is an interactive system which displays the date, time on the screen.

1.2 INTERNET OF THINGS:

The Internet of Things (IoT) can be considered as a universal network which enables the interaction between non living to non living things and human and the non living things. It is the mechanism in which anything in the world can by identified using a unique identity to each and every object. The video captured can be sent through the web page with the help of internet. The user can access the video from anywhere in the world through web page. And the robot can be used in the hazardous place to capture the video and to live streamthe same over internet.

2. LITERATURE REVIEW

2.1 INTRODUCTION:

P. Raja, Swapnil Bagwari et al (2018) presented a MASS(military assistance and surveillance system) that uses different type ofsensor to monitor the soldier such astheir location, health conditions, surroundings, sending data to base station, etc. being a wearable device it monitors the pulse rate as well as send the respective data to the base station and by using GPS module the location can also be monitored by military base station. Since it is wearable installation will be cost effective and will add a heavy pack load for soldier. MinalS.Ghute, Kanchan P. Kamble, MridulKorde et al (2018) described a military surveillance robot system consists of a single unit, which will monitor the environment in various hazardous conditions and provide live video feedback. Gyro sensor has been used to move robot in hilly areas, metal detection for landmines. It uses Bluetooth connectivity for wireless communication through mobile application which make it range limited.

Aditya prakash, Raheewalambe et al (2018) described about a simple military surveillance robot with the commands for moving front, back, right, left and stop are being received from the remote controller and accordingly the input is fed to the Raspberry pi 3 which makes the robot setup respond as per the instructions given. The Kinect sensor works like a camera with an additional feature of depth measurement i.e., it depicts the distance of object from itself by representing the object in the form of grayscale values ranging from 0 to 255 where 0 amounts to black which implies the object is closer and 255 amounts to white which implies the object farther.

This reduces the frequency of data exchange between the sensor nodes and the control Centre thereby increasing the lifetime of the IoT.70% reliability has been achieved. Ghanem Osman Elhaj Abdalla, T. Veera Mani Kandasamy et al(2017) implemented a SpyRobotfor A Surveillance System using Internet Protocol of Raspberry Pi a Raspbian operating systembased spy robot platform with

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

remote monitoring and control algorithm through Internet of Things (IoT).

The information regarding the detection of living objects by PIR sensor is sent to the users through the web server and pi camera capture the moving object which is posted inside the webpage simultaneously. MajdGhareeb, Albazi, Mohamad Raad, shamihabdulnabi et al (2017) presented Wirelessrobo-pi for landmine detection as a low-cost European Journal of Molecular & Clinical Medicine ISSN 2515-8260 Volume 07, Issue 01, 2020 4203 automated mine detector that will replace the current human detectors in the mission of detecting and extracting mines in a suspected area of land. This detector will wirelessly connect with a server to send the location of detected mines or metal and captured image of land where it is found. Since the detector is raspberry pi based, we can make it as IoT based for further communication.

3. METHODOLOGY AND HARDWARE DESCRIPTION

3.1 BLOCK DIAGRAM:

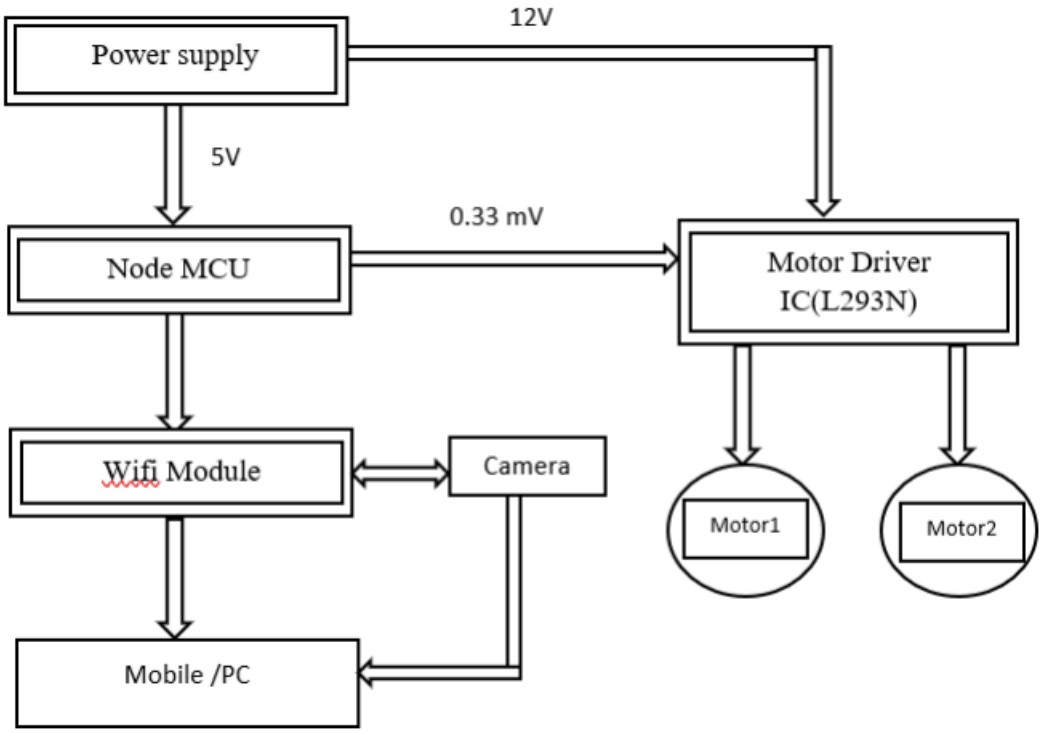

Fig.3.1 block diagram of military purpose robot using IoT

3.2 INTRODUCTION TO NODE MCU:

Node MCU is an open source LUA based firmware developed for the ESP8266 Wi-Fi chip. By exploring functionality with the ESP8266 chip, Node MCU firmware comes with the ESP8266 Development board/kit i.e., NodeMCU Development board.

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

Fig.3.2 Node MCU Development Board/kit v0.9 (Version1)

Since NodeMCU is an open-source platform, its hardware design is open for edit/modify/build. NodeMCU Dev Kit/board consist of ESP8266 wifi enabled chip. The ESP8266 is a low-cost WiFi chip developed by Espressif Systems with TCP/IP protocol. For more information about ESP8266, you can refer to the ESP8266 Wi-Fi Module.

3.3 THE DIFFERENCE IN USING ESPLORER AND ARDUINO IDE:

Well, there is a programming language difference we can say while developing an application for NodeMCU using Explorer IDE and Arduino IDE. We need to code in C\C++ programming language if we are using Arduino IDE for developing NodeMCU applications and Lua language if we are using Explorer IDE. Basically, NodeMCU is Lua Interpreter, so it can understand Lua script easily. When we write Lua scripts for NodeMCU and send/upload it to NodeMCU, then they will get executes sequentially. It will not build a binary firmware file of code for NodeMCU to write. It will send Lua script as it is to NodeMCU to get executed.

3.4 PRINTED CIRCUIT BOARD:

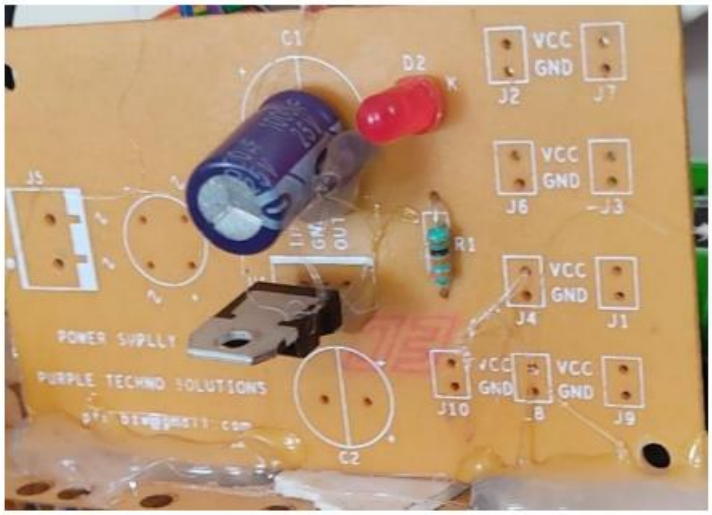

Fig.3.4 printed circuit board

A printed circuit board (PCB) or printed wiring board (PWB) is a laminated sandwich structure of conductive and insulating layers. PCBs have two complementary functions. The

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
ISSN: 2457-0362

first is to affix electronic components in designated locations on the outer layers by meansof soldering. The second is to provide reliable electrical connections (and also reliable open circuits) between the component's terminals in a controlled manner often referred to as PCB design. Each of the conductive layers is designed with an artwork pattern of conductors (similar to wires on a flat surface) that provides electrical connections on that conductive layer. Another manufacturing process adds vias, plated-through holes that allow interconnections between layers.

3.5 WEB CAMERA:

A webcam is a video camera that feeds or streams its image in real time to or through a computer to computer network. When "captured" by the computer, the video stream may be saved, viewed, or sent on to other networks via systems such as the internet, and email as an attachment. When sent to a remote location, the video stream may be saved, viewed or on sent there. Unlike an IP camera(which connects using Ethernet or Wi-Fi), a webcam is generally connected by a USB cable, or similar cable, or built into computer hardware, such as laptops. The term 'webcam' (a clipped compound) may also be used in its originalsense of a video camera connected to the Web continuously for an indefinite time, rather than for a particular session, generally supplying a view for anyone who visits its web page over the Internet. Some of them, for example, those used as online traffic cameras, are expensive, rugged professional video cameras.

4. MOTOR DRIVER

4.1 INTRODUCTION

L298N module is a high voltage, high current dual full-bridge motor driver module for controllingDC motor and stepper motor. It can control both the speed and rotation direction of two DC motors. This module consists of an L298 dual-channel H-Bridge motor driver IC. This module uses two techniques for the control speed and rotation direction of the DC motors. These are PWM – For controlling the speed and H-Bridge – For controlling rotation direction. These modules can control two DC motor or one stepper motor at the same time.

L298 motor driver

IC L298 is a high voltage, high current dual full-bridge motor driver IC. It accepts standard TTL logic levels (Control Logic) and controls inductive loads such as relays, solenoids, DC, and Stepper motors. This is a 15 pin IC. According to the L298 datasheet, its operating voltage is +5 to +46V, and the maximum current allowed to draw through each output 3A. This IC has two enable inputs, these are provided to enable or disable the device independently of the input signals.

A black color heat sink is attached to the L298 IC of the module. A heat sink is a passive heat exchanger that transfers the heat generated by an electronic or a mechanical device to a fluid medium, often air or a liquid coolant.

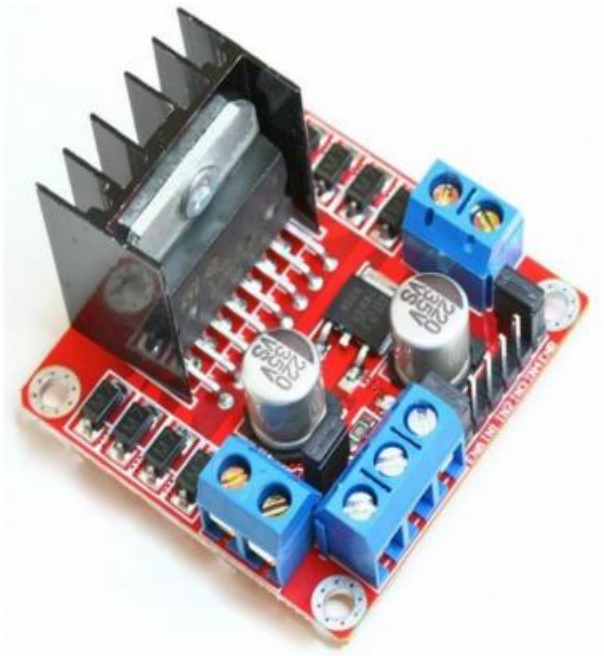

Fig 4.1 IC298N Motor Driver

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

4.2 PIN DESCRIPTION:

L298N IC pins	Name	Function
1,15	Sense A, Sense B	Between this pin and the ground, a sense resistor is connected to control the current of the load.
2,3	Out 1, Out 2	Outputs of the Bridge A; the current that flows through the load connected between these two pins is monitored at pin 1.
4	VS	Supply Voltage for the Power Output Stages. A non-inductive 100nF capacitor must be connected between this pin and ground.
5,7	Input 1, Input 2	TTL Compatible Inputs of the Bridge A.
6,11	Enable A, Enable B	TTL Compatible Enable Input: the L state disables the bridge A(enable A) and/or the bridge B (enable B).
8	GND	Ground
9	VSS	Supply Voltage for the Logic Blocks. (A100nF capacitor must be connected between this pin and ground.)

CONCLUSION

This robot was built by keeping military applications in mind. So, it comes with basic video surveillance and metal detection so that it can detect underground landmines etc. Further extensions can be made in the same projects such as home automation, telemedicine system. The robot can be equipped with interactive voice feedback. It is possible to install ME (medical emergency) band in the robot to look after the health of an elderly person in the house. History has shown that the military makes use of every innovation that has the potential to support military work In the designing of our projects, we have kept in mind the user. The controlling of robot is easy as the various buttons are available on the web page specifying the various actions. The Android device used here makes possible the fast and good quality of image transmission. The programming used gives very good control on the movements of the robot. The Controlled Wireless communication can be achieved using Wi-Fi network or internet. The

future implications of the project are very great.

REFERENCES

[1] K. Kaneko, F. Kanehiroz,S.Kajita,H.Hirukawa,T.Kawasaki, M.Hirata,K.Akachi,T.Isozumi, "Ho monoid robot HRP_2," IEEE International Conference on robotics and automation, New Orieans, LA 2004.

[2] Pavan.C, Dr. B. Sivakumar "Wi-Fi ROBOT FOR VIDEO MONITORING & SURVEILLANCE SYSTEM" International Journal of Scientific & Engineering Research Volume 3, Issue 8, August-2012

[3] Supriya P Kurlekarr, Sahil R Shaikh, Prasad D Zadbuke, Akanksha S Yadav and Hamid J Shaikh#2 " IoT based military robot for military services" International Journal Of Creative Research And Thoughts Volume 9, Issue in May 2021.

[4] A. Aashraya , P. Munaswamy "Iot Based Military Robot Using Raspberry Pi3" Volume 07, Issue 01, 2020.

[5] Nodemcu Introduction ToNodemcu | Nodemcu (electronicwings.com).

[6] Vaibhavi Wanjari1, Chandrashekhar Kamargaonkar" A Review Paper on IoT based Cognitive Robot for Military Surveillance" Volume: 06 Issue: 11 | Nov 2019.

[7] Motor Driver IC • Technology Robotix Society, IIT Kharagpur.

[8] Camera module - Wikipedia.

[9] Different Types of Batteries: Uses and Applications | Wiltronics, "Different Types of Batteries: Their Uses and Applications" June 2, 2021.

[10] "Steps to Setup Arduino IDE for NODEMCU ESP8266" By Armtronix in CircuitsArduino.