



IOT BASED ROBOT FOR MILITARY APPLICATION

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Abstract: The fastest-growing most exciting discipline in the modern era is robotics. Robot has a wide range of inputs and outputs in order to perceive its environment and react appropriately. Through technical research and development, scientists have created military robots. As a result, soldiers' lives were safer on the battlefield. As well as keeping a watch on battlefields, neutralising live dud bombs, identifying landmines, and firing at intruders, military robots are used to perform a number of perilous tasks. These military robots have integrated systems, such as sensors, grippers, arms, cameras, or motors. Depending on its task, a robot's shape and attributes change. The problems with terrorism and revolt that the population and army are dealing with are the cause of robots with full autonomy are in demand. Nations pour large sums of money towards the research of new defensive technology that can shield citizens from terrorist threats.

A "IOT-based Robot that can monitor security conditions in military applications" is the main goal of this project. This technology makes use of a motorised robot. A micro controller oversees each activity. Based on its motor activity, the ROBOT will travel in a particular direction. The user may communicate with this robot by using IOT technologies. The robot has an ultrasonic sensor which can locate a human. The military employs the proximity sensor as well as other sensors to locate land mines. The robot halts and emits a warning buzzer whenever any sensor triggers an action.

Keywords: IOT, Proximity and PIR Sensors.

I. INTRODUCTION

The Internet of Things, also known as the IOT, is a system of interconnected computers, mechanical plus digital equipment, household goods, living things, and people that allows data to be exchanged without the need for direct human or computer contact [1]. The IOT creates prospects for a more direct integration of the outside world with computer-based systems by enabling items to be sensed or controlled remotely through an existing network infrastructure. Additionally, this technology increases efficiency, accuracy, and revenue while lowering the need for human interaction. In the current world, robotics is a quickly developing and exciting field [2]. ROBOT has the ability to observe its environment and provide a range of outputs to react accordingly. Scientists have developed military robots as a consequence of research and technical development. As a result, soldiers' lives are safer. battlefield outcome. In addition to keeping a watch on the battlefield, military robots are also used to locate landmines, neutralise live unexploded bombs, and shoot at intruders. Integrated systems, such as sensors, grippers, arms, cameras, or actuators, are included in the military robots' equipment [3]. Depending on its purpose, robots can have different shapes and features. Demand for self-controlling robots is driven by problems that the populace and military are facing with terrorism and revolt. The creation of new defensive technology that can shield populations from terrorist threats is a major source of national funding [4].

II. LITERATURE SURVEY

The literature survey and reviews for the regarding are as follows:

IoT Applications in Defense & Security [5]

In this paper the proposed security arrangement depends on our novel mix of camera on Raspberry Pi. Raspberry Pi works and controls camcorder for reconnaissance and records video for future playback. The other significant preferred position is that it is a basic circuit where specific working framework



must be introduced so the picture can be shown. Raspberry Pi devours more force when contrasted with a PC utilizing INTEL Pentium 2 processor. The Raspberry Pi's memory is likewise constrained which is been defeated in the current proposed framework which utilizes External EEPROM memory AT24C02/4/8/16/32A having a high adaptability in volume. Raspberry Pi utilizes L293D Driver chip.

Coal Mine Rescue Robots [6]

Security of an individual is essential worry in any industry particularly in underground coal mining industry. Underground correspondence is important to screen underground ecological parameter, for example, temperature, humidity, harmful gas and so forth and take fundamental activities in like manner to stay away from any sorts of risk. In this paper a robot based remote checking and security framework for underground mines utilizing remote correspondence convention zigbee is proposed, which will take the information of natural parameters of underground mine utilizing various sensors and send the information to control room utilizing zigbee. This entire framework will be put on a robot which is worked by remote. Utilization of remote robot will lessen the human intercession in security framework and will improve the wellbeing.

Wireless multifunctional robot for military applications [7]

Robots are exceptionally structure for human to make our life simpler. Robots are structure for different purposes like military reason, industry, for locally situated application. At outskirts various kinds of tanks, rockets and weapons are utilized by the adversary. This causes issues and will hurt our power or troopers. Hence in this paper a robot is structured and produced for military reason application to ensure our military. The strategy includes a biped strolling robot utilizing equal leg instrument for example PLM which incorporates various capacities like catching certifiable information utilizing advanced picture handling used to recognize its impediment which is found in its way.

III. AIM AND OBJECTIVES

A. Aim

To detect the persons and metal mines using sensors in the military applications.

B. Objectives

- 1) To makes soldier's life more secure on war field.
- 2) Military robots are used to perform various risky tasks like monitor war field, diffuse live unexploded bombs, detect landmines.

IV. BLOCK DIAGRAM

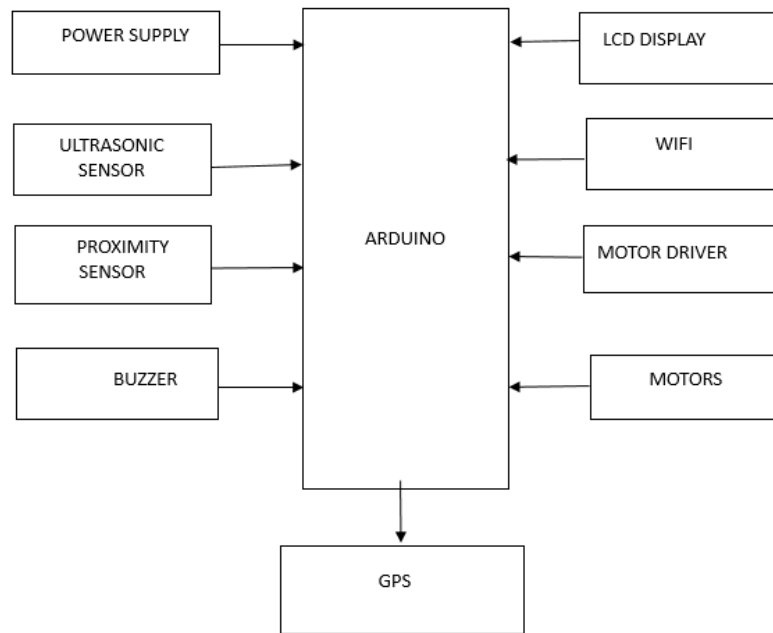


Fig1: block diagram

V. HARDWARE DESCRIPTION

The main components of the project are:

- A) Arduino UNO
- B) LCD
- C) Ultrasonic Sensor
- D) Proximity Sensor
- E) Power Supply
- F) GPS
- G) Buzzer
- H) Wifi

A) Arduino UNO

The most common version of Arduino is the Arduino Uno. There are different revisions of Arduino Uno below detail is the most recent revision (Rev3 or R3). The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

B) LCD

An display device employs the liquid crystal layer to alter its optical properties by the application of varied electric voltages. This particular display module is used in a variety of circuits and gadgets, such TVs, computers, calculators, cell phones, and various other electronic devices. The two main uses for these displays are seven-segment displays and multi-segment light-emitting diodes.

C) Ultrasonic Sensor

Ultrasonic sensor is used to detect the moving object, when micro waves strike object the which are transmitted from the transmitter returns back to the receiver so that through the wifi we get information of the moving object with GPS location, by location of obstacles we can exactly measure the object.

D) Proximity Sensor



A proximity sensor can detect metal targets approaching the sensor, without physical contact with the target. Proximity sensors are roughly classified into the following three types according to the operating principle: the high-frequency oscillation type using electromagnetic induction, the magnetic type using a magnet, and the capacitance type using the change of capacitance.

E) Power Supply

A power supply is a device that generates electricity for an electrical equipment. Changing the electrical current, the frequency, or voltage of electrical current flowing from an electrical source to ensure it can power a load is the main purpose of a power supply.

F) Global Positioning System:

Global Positioning System," or simply "GPS," is the abbreviation for a navigation satellite that provides users with access to position and time information in all kinds of weather. All types of vehicles—planes, ships, cars, and trucks—use GPS for navigation. The system gives users in both the military as the civilian sphere essential skills. Globally, GPS continually provides three-dimensional navigation, timing, and location services.

G) Buzzer

It is also possible to use an audio signalling device like a buzzer or beeper that is electromechanical, mechanical, piezoelectric, or another type. The main purpose of this is to convert audio signals into sound.

H) Wifi

The Wi-Fi signal's range depends on whether it is being used indoors or outdoors. By reading the signals, the Wi-Fi devices will establish a link to the internet across the user with the network.

F) Motor driver

Motor drivers perform this role as a link between the motors and the control circuits. The motor needs a significant amount of current, in contrast for the control circuit, which runs on low current signals.

VI. SOFTWARE DESCRIPTION

This project is implemented using following software's:

a) Arduino IDE

The below figure 2 shows the Arduino IDE. After installing the Arduino IDE on your computer and set up the board so that it is ready to accept programmes via USB cable



Fig-2 Arduino IDE

Open-source platform for prototyping Arduino is composed of straightforward hardware and software. It consists of a circuit board that has a programming interface, or "microprocessor," and already-developed software termed the Arduino IDE (Integrated Development Experience), that is used for writing and uploading computer code to the physical board.

VII. FLOW CHART

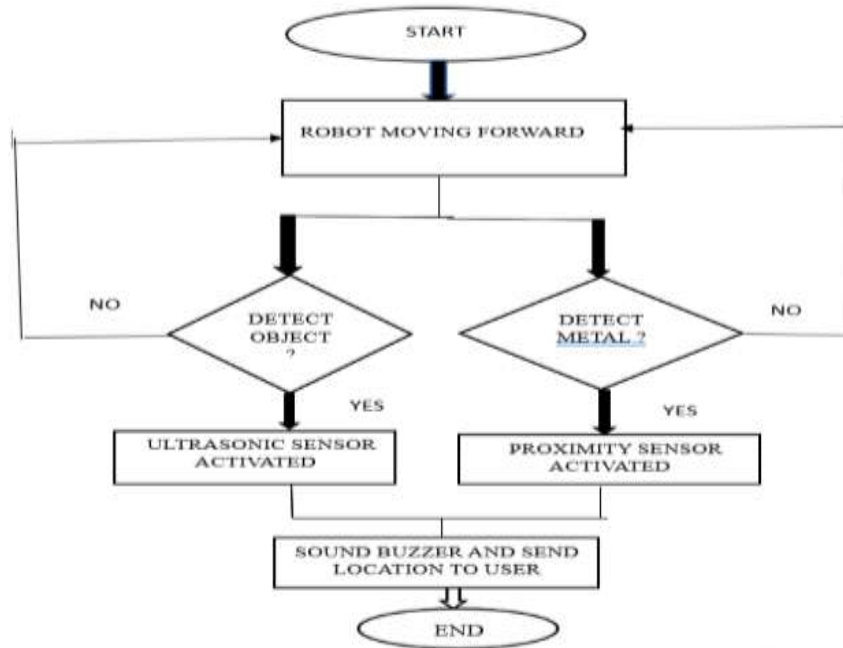


Fig 3: Flow chart

The graphic shows a complex robot for military usage as well as a complete realistic kit with full circuit connections. Electronic are included in the package.

Robot going ahead:

When we tell the robot to move forward, left, or right, respectively, we may direct it in any direction we need to, based on our requirements.

Robot capable of detecting metal:

When a robot going regardless of direction—for example, up, down, left, or right—discovers metallic items, it instantly stops and sends the message "Metal identified with GPS location" to the person managing the source.

Robot with obstacle:

As seen in the image, robots are capable of detecting impediments while going forward or backward. If an obstruction is found, the robot quickly stops moving and sends a signal using GPS to tell where it is.

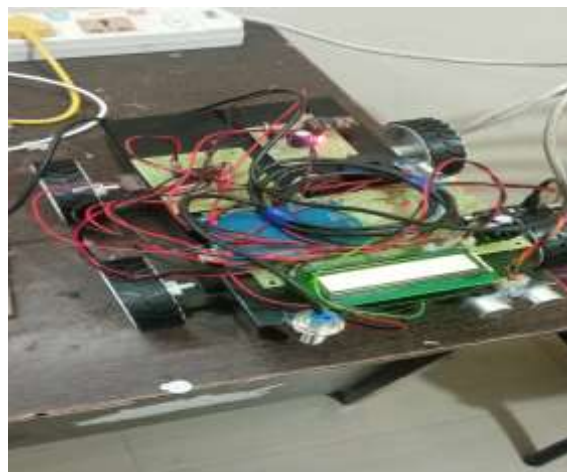


Fig 4: hardware kit



CONCLUSION

From this project we can successfully implement Since it enables the operator to control the robotic's motion from any location around the world while getting information from surrounding live obstacles and things, this type of communication technique increases the operating range of the robot. The operational range of earlier robots was more limited. This robotics vehicle, which comprises a number of submodules, might be used as a security or surveillance robot or for operations that involve rescuing lives. Protecting human life and regulating robot activity are the main objectives of this initiative.

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