AN ADVANCED IOT BASED ROBOT FOR MILITARY APPLICATION

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***Abstract*:** The main goal of this paper is to present an " **IOT based Robot which can monitor security conditions in military applications".** In this system, a robot is fitted with motors. A micro controller is used to control all operations. According to the motor operations the ROBOT will operate in specified directions. This robot can be controlled by commands received from the user through IOT technology. The robot is having Ultrasonic sensor which will detect the persons. Another sensor is the Proximity sensor which will detect the land mines in the military, if any one of the sensor activate the robot gets stopped and the buzzer will be alert.

***Keywords*:**IOT,Proximity and PIR Ssensors.

1.1 Introduction :

The Internet of Things (IOT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifier and the ability to transfer data over a network without requiring human- to-human or human-to-computer interaction. The IOT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention.

In today's world, robotics is fastest growing and very interesting field. ROBOT has various input and output to sense the environment and take appropriate action.. With the development and research of technology, scientist has come up with invention of military robots. This makes soldier's life more secure on war field. Military robots are used to perform various risky tasks like monitor war field, diffuse live unexploded bombs, detect landmines and shoot enemies.. These military robots appointed with the integrated systems like sensors, gripper, weapons, cameras and actuators. based purpose of robot it comes in different shapes and features.

The need for self con-trolled robots is due to the terrorism and insurgency problems faced by the people and soldiers. Huge investments are made by nations for the research of new defence systems which are capable of safeguarding citizens from terrorist threats.

Existing System

The existing system has a drawback that is it has less range and we cannot determine the exact location of robot so with this we cannot know where it is going and location of the robot if we have a robot location when it detects the human beings we can plan attack on them wisely. As well as existing systems which track or detects the land mines by manually holding device with human so it may have some tracking problems

and it is less range communication. It will not give security to the soldiers to avoid the problem we have invented a robot with more range and exact location of the robot with global positioning system.

2.1 Proposed System

The proposed system has a more range to track the robot and wirelessly it detects the exact location of the robot such that it completely eliminates the man and give security to the human life.IOT is new wireless technology guided by IEEE 802.15.4 Personal Area Network standard. It is primarily designed for the wide range controlling applications and to replace the existing non-standard technologies. One of the main advantages of this IOT communication is that it provides a noise free communication, the amount of noise added in this type of communication is very less compared to the other wireless communications.

In this system, a robot is fitted with motors. A micro controller is used to control all operations. According to the motor operations the ROBOT will operate in specified directions. This robot can control by commands received from the user through IOT technology. The robot is having PIR sensor which will detects the persons. Another sensor is the Proximity sensor which will detect the land mines in the military. If any one of the sensor activate the robot gets stopped and the buzzer will ring. This project uses solar panel and 12v DC battery power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the output of DC battery.
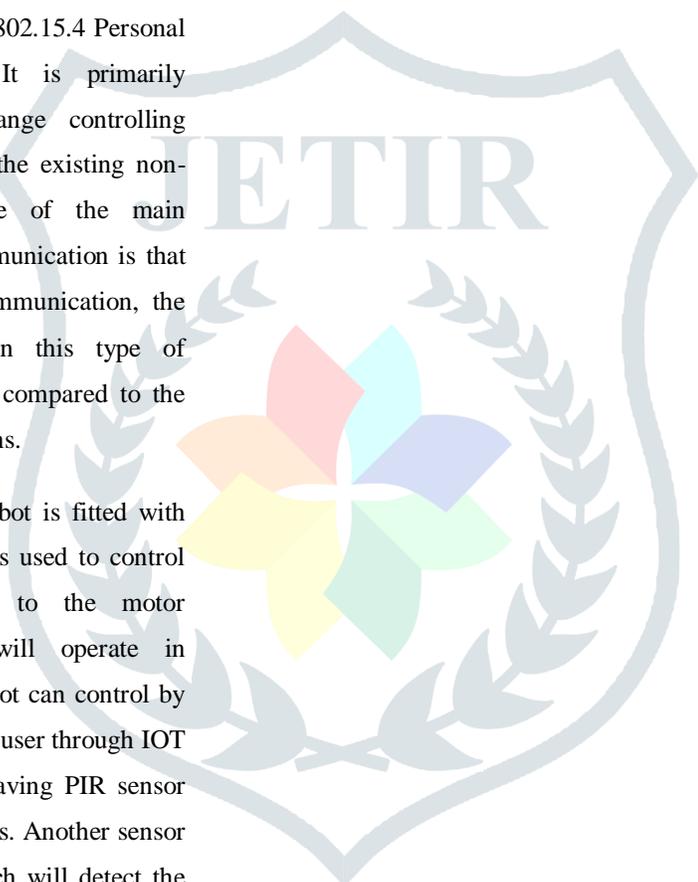
METHODOLOGY

3.1   Block diagram of IOT based Robot
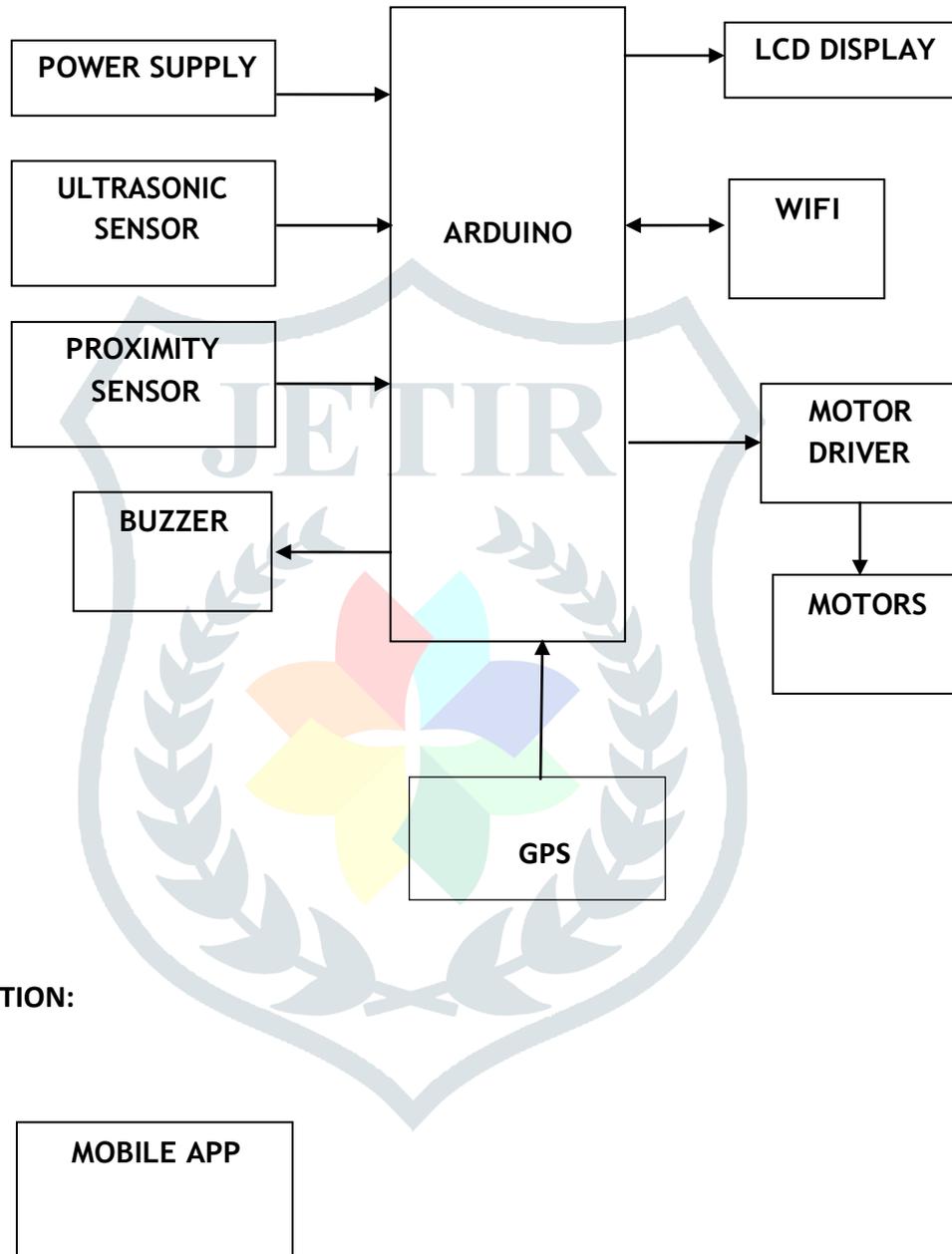

CONTROLLING SECTION:

Fig: 1 .Block diagram of IOT based Robot

3.2 Description

The main objective of this Paper is to control robot directions and give security to the human life at borders. To operate the robot we have to give 12v power supply and this robot has two sensors one is to detect the metals and another one is to detect the obstacle such as proximity sensor for metals and ultrasonic sensor for motion of objects such as man, material, walls etc. It has a LCD stands for liquid crystal display for to display the information of metal detection, obstacle detection and GPS location. It uses Wi-Fi to send the information wirelessly and we use buzzer for only intimation. It uses motor driver to control the robot action in forward, backward, right and left directions. It has a GPS (Global Positioning System) to determine the exact location of the robot and we use the Arduino to control all operations and it also called as controlled device, we use a program that will dump to the Arduino board as per user requirement, Wi-Fi sends information to the observer wirelessly.

Fig2.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. This concept is used many areas such as toys cars, robots, automatic door opening, sports training, contactless speed measurement.Existing ultrasound sensors consist of multiple passive and active components and are relatively complicated for production and testing. Sensors often times require a laborious tuning process.

3.3 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.

Fig: 3. Proximity Sensor

Proximity sensor is a sensor able to detect the presence of nearby objects without any physical contact. The object being sensed is often referred to as the proximity sensor's target. Different proximity sensor targets demand different sensors. For example, a capacitive or photoelectric sensor might be suitable for a plastic target; an inductive proximity sensor always requires a metal target.

Proximity sensors are commonly used on smart phones to detect (and skip) accidental touch screen taps when held to the ear during a call. They are also used in machine vibration monitoring to measure the variation in distance between a shaft and its support bearing.

3.4 Global Positioning System:

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather, anywhere on or near the Earth, where there is an unobstructed line of sight to four or more GPS satellites.

GPS will give the exact location of the object with latitude and longitude values. It plays a significant role in this project for identifying location in anyplace irrespective of any distractions naturally occurred.

3.5 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.
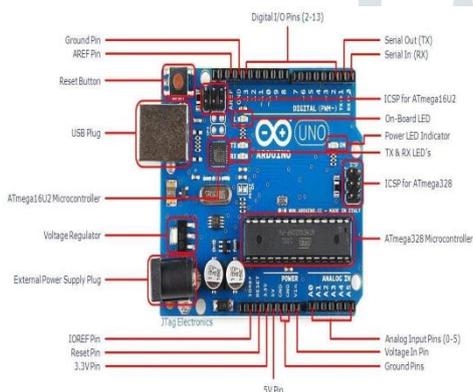

Fig: 4 Arduino Uno R3 Board

3.6 ESP 8266 WIFI:

. The **ESP8266** is a low cost Wi-Fi microchip .

This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands.

RESULTS

Hardware kit

The figure shows the practical kit with all circuit connections, the shows the electronic devices such as proximity

sensor, ultrasonic sensor, GPS, WIFI module,Arduino, motor driver, 12v battery, these all device connected together to form an advanced robot for military application.

Robot moving forward direction:

When we give command as ***F#** moves in forward direction, ***L#** moves in left direction, *R# robot moves in Right direction so that as per our requirement we can move this robot in any direction.

Robot with metal detection

The robot moving in anyone of direction such Forward, Backward, Left, Right, when robot detects the metal it automatically stops the robot and sends the information in display as **Metal detected** with GPS location to the person who is operator at source.

Robot with obstacle:

When robot moving in forward direction or backward direction if it detects the obstacle as shown in the figure it describes a box as object detected and immediately robot stops motion and sends the signal as **Obstacle detected** with GPS location.**Fig: 5. IOT based Robot**

CONCLUSION

This type of communication technique enhances its range of operation, where the user can control the movement of robot from any part of world by getting live obstacles and metals of surrounding as feedback, compared to earlier robots has a limited operational range. This robotic vehicle with different sub modules can widely be used as surveillance robot for security purpose and emergency rescue operations. The main of this project is to control the robot actions and security for human life.

It will be the added gadget to armed forces to carry out work easily.

FUTURE SCOPE

In future we can add some features in advancement to the robot for efficient working, desired operation and accurate results such night vision camera to take the images and videos recording, also we can add gun firing on target with exact vision of camera.

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