

EXPLOSIVES DETECTION AND CONTROL USING EMBEDDED SYSTEMS

#1K. HARI KRISHNA, #2T.ANIL KUMAR, #3K.ANIL KUMAR, #4D.DILEEP , #5B.PREETHI

DEPT OF ECE

Satya Institute Of Technology And Management, Vizianagaram.

ABSTRACT:

In modern times due to continuous evolving threats in our daily lives and changing social conditions we are under constant threat of terrorism and manmade accidents. Daily many of our soldiers risk their lives to keep us safe. Due to evolution electronics and advanced microcontrollers many cost effective systems have evolved which reduce life threat and are reliable. The traps are a new type of threat they are well hidden and cannot be caught simply by observing. Instead of relying on solely eyesight we can utilize advanced sensors and electronic devices to get better realization of the available dangers and obstacles. So we need to implement a system that detects and jams the devices based on their electronic configuration. These systems can further be used as explosive controller to make controlled detonations and further application in industrial zones.

Keywords: *explosives ,Arduino,bot, detection, control.*

I.INTRODUCTION:

The technical improvement together with the need for high performance robots created faster, more accurate and more intelligent robots using new robots control devices, new drives and advanced control algorithms. The presented robot control system can be used for different sophisticated robot applications. This bomb detecting robot is fully controlled by the Arduino. Most of the military organization now takes the help of robots to carry out many risky jobs that cannot be done by the soldier. These spy robots used in military are usually employed with the integrated system and sensors. The military robots also have different shapes according to the purposes of each robot. Thus the proposed system, an Intelligent wireless Robot saves human lives and reduces manual error. This is specially designed bomb detecting robot system to save human life and protect the country from enemies.

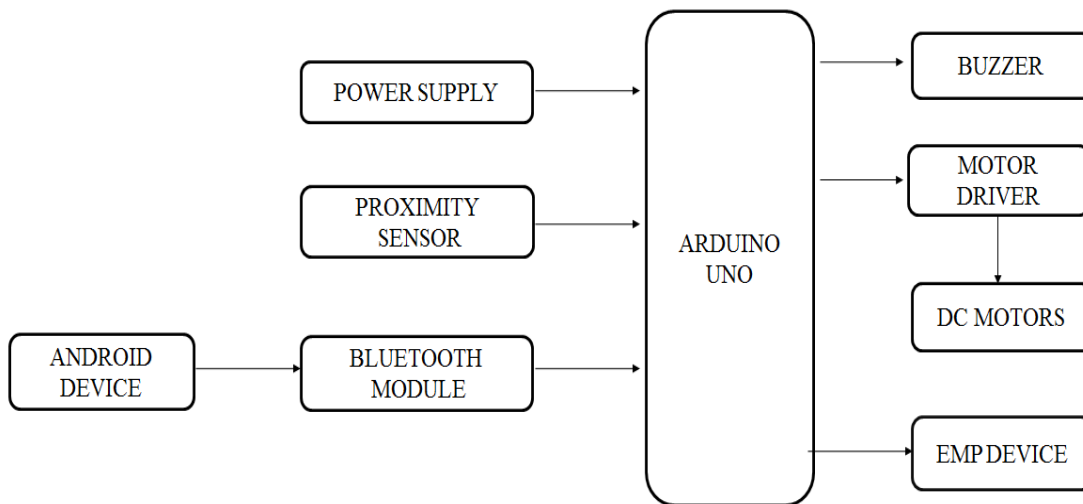
One of the most important things about these robots is that they have the capability to perform missions remotely in the field, without any actual danger to human lives. Using one chip that contains all the needed functions in place of a microprocessor and many peripheral chips has compact the size and the power conservation of control oriented applications. We are performing this task using an arduino microcontroller.

II.LITERATURE REVIEW:

We read about terrorism and all the other threats in news and people are hugely effected by this to save human lives we are risking a robot instead of a human to overcome these problems. For that reason we are using an embedded system to overcome these issues so this project is mainly dedicated to the field of security and military.

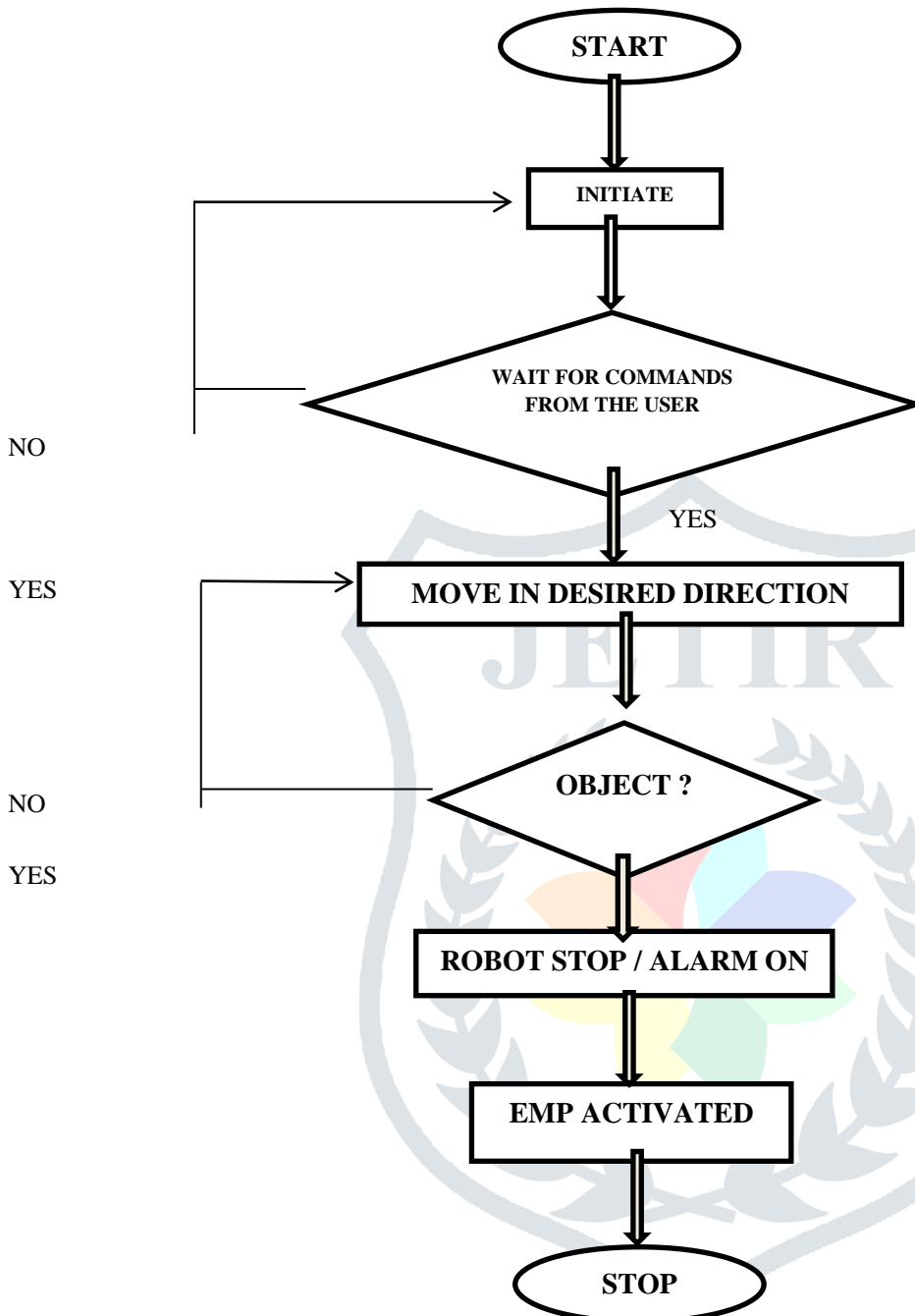
III.PROPOSED METHODOLOGY:

The proposed methodology is devised into mainly number of modules. Unmanned robot is attached to a Bluetooth sensor which is operated by an android device that sends the instructions through its attached Bluetooth via android application.The proposed methodology is explained below in the block diagram. The block diagram is a perfect control system executing the task of detection and control using various sensors and modules. The proposed methodology is to build a cost effective robot that can be maintained and reused in many applications based on the requirement.

BLOCK DIAGRAM:**WORKING PRINCIPLE:**

The Arduino board takes power supply from external sources through a 12v battery or a data cable connected to the USB . The arduino device is controlled via Bluetooth HC-05 module interfaced with the android mobile (atleast android 4.0) through an android app installed. The motor driver L293D is given required power through voltage regulator IC to the DC motors .

The movement is controlled is by an android device used by the operator. The proximity sensor detects the metal components in the explosives and activates the buzzer. The buzzers alerts the user. The user may or may not activate the EMP based on the type of explosive. The EMP destroys the circuit in the detonator. The EMP can be detached or made embedded into the arduino or can be externally connected to the power supply and be operated independently.

FLOWCHART:**IV.HARDWARE DESCRIPTION:****1.ARDUINO UNO:**

It is an open source platform where anyone can modify and optimize the board based on the number of instructions and task they want to achieve. This board comes with a built-in regulation feature which keeps the voltage under control when the device is connected to the external device. There are 14 I/O digital and 6 analog pins incorporated in the board that allows the external connection with any circuit with the board. These pins provide the flexibility and ease of use to the external devices that can be connected through these pins. There is no hard and fast interface required to connect the devices to the board. The 6 Analog pins are marked as A0 to A5 and come with a resolution of 10bits..13KB of flash memory is used to store the number of instructions in the form of code. Only 5 V is required to turn the board on, which can be achieved directly using USB port or external adopter, however, it can support external power source up to 12 V which can be regulated and limit to 5 V or 3.3 V based on the requirement of the project.

2.DC MOTORS:

A magnetic field is produced as the current passes through the wire, or coil of wires. This magnetic field opposes against the permanent magnet set the right beside the coil. Thus resulting in a force going up or down depends on the right hands rule. When the motor rotates the direction of the current will change to the other direction. Consequently, keeping the polarity of electromagnetic force always opposing the permanent magnet. Therefore, the motor keep rotating as long as electrical power is constantly supplied.

3.PROXIMITY SENSOR:

A proximity sensor is an electronic sensor that can detect the presence of objects within its vicinity without any actual physical contact. In order to sense objects, the proximity sensor radiates or emits a beam of electromagnetic radiation, usually in the form of infrared light, and senses the reflection in order to determine the object's proximity or distance from the sensor.

4.BLUETOOTH:

The HC-05 Bluetooth device is used to interface between the arduino device and the arduino micro controllers

- Operating voltage: 4v to 6v
- Operating current :30mA
- Operates in master slave mode
- Supports up to 7 device
- Works of serial communication

5.EMP JAMMER:

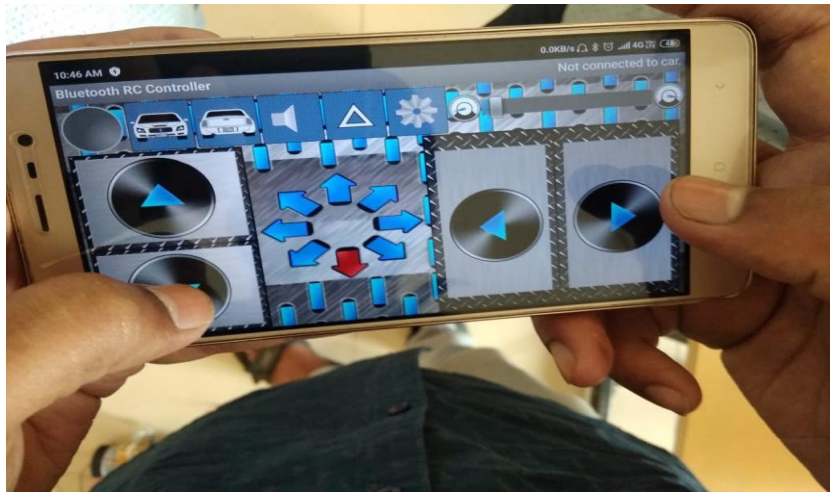
An **electromagnetic pulse (EMP)**, also sometimes called a transient electromagnetic disturbance, is a short burst of electromagnetic energy. Such a pulse may occur in the form of a radiated electric or magnetic field or conducted electrical current depending on the source. Every electric device has an electric and a magnetic field . An EMP alters the default fields of the device and creates a disturbance. The disturbance or jamming ability depends on the intensity and input power of the EMP device.

6.BUZZER:

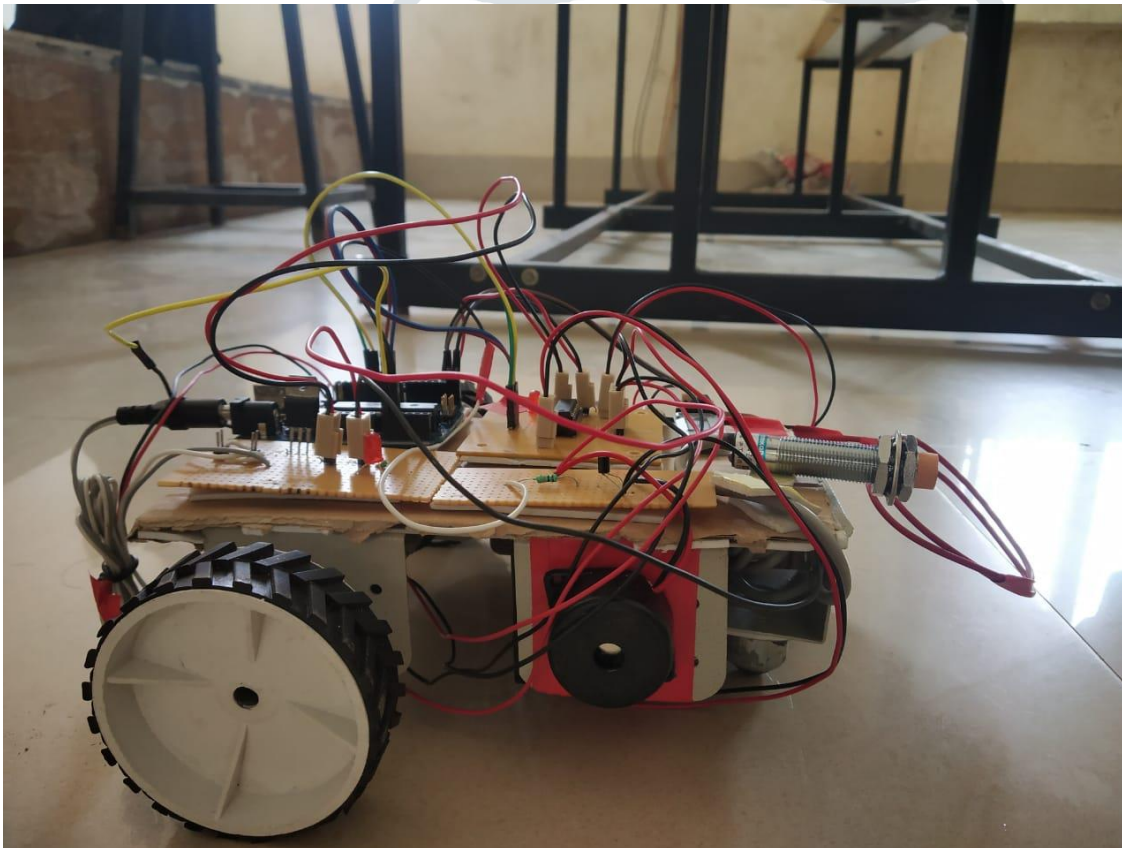
Buzzer is a device which generates beep sound. It requires 5v DC and also interfaced with a BC547 transistor for amplifying the low current into sufficient amplification. The device which is used in this project for alerting when arrival of new data.

V.RESULTS:

The device is interface with Bluetooth using Bluetooth RC controller app.The directions are same as the arrows the Bluetooth RC robot we move the robot the directions are same as pointed in the arrows. The arrows include the north east , north west , south east and south western directions. The robot can operate total in 8 directions its operations gets paused when it detects and obstacle and activates the EMP jamming device . The robot gives a huge buzz from the buzzer placed on its right side panel.



We can see that the EMP and its components are well insulated such that its jamming ability doesn't take out the same kit it is operated upon. The EMP and the inductive proximity sensor are placed side by side and are well spaced in either direction to avoid mutual detection by proximity sensor and avoid jamming by the EMP module.



In the end when the robot detects explosive equipment it pauses its movement gives an EMP beam and damages the suspicious object

VI.CONCLUSION:

This type of bomb detection system is very useful to the national security and it reduces the dangerous threat of terrorism posed upon us by the society. The proposed system has an additional jamming ability which makes the bomb inactive and adds enough time for the people to evacuate the region. It also plays a major role in detecting smuggled goods in high security zones.

VII. REFERENCES:

1. T. Ueyama and T. Fukuda. Self-organization of Cellular Robots using random walk with simple rules. In Proc. IEEE Int. Conf. on Robotics and Automation, pages 595{600,1993}.
2. V. Ramya B. Palaniappan T. Akilan ‘Embedded System for Robotic Arm Movement Control using Web Server and ZigBee Communication’ International Conference on Research Trends in Computer Technologies (ICRTCT - 2013)
3. Bharath Reddy Pannala,DR. R.V.Krishnaiah “Design and Implementation of a Bomb Diffusing Surveillance Robot using RF Technology” semar groups technical society.
4. Prashant Limje,Shailesh N. Khekale “BOMB DETECTION AND DEFUSION IN PLANES BY APPLICATION OF ROBOTICS” International Journal of Application or Innovation in Engineering & Management (IJAEM).
5. A. Colorni, M. Dorigo, and V. Maniezzo. Distributed optimization by ant colonies. In Proc. 1st European Conf. on Artificial Life, pages 134{142, 1992}.
6. Bharath Reddy Pannala, DR. R.V.Krishnaiah” Design and Implementation of a Bomb Diffusing Surveillance Robot using RF Technology”- International Journal of VLSI Design and Communication Systems Vol.01, Issue.03.

BIBLOGRAPHY

1. K. HARI KRISHNA working as a Asst. Professor in Dept of ECE in Satya Institute of Technology And Management, Vizianagaram.
2. T.ANIL KUMAR(15B61A0477)
3. K.ANIL KUMAR(15B61A0437)
4. D.DILEEP (15B61A0423)
5. B.PREETHI (15B61A0410) pursuing B.Tech in ECE in Satya Institute Of Technology And Management, Vizianagaram.