# Metal Detector Robot Vehicle Operated by Android Application

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**ABSTRACT:** The project is designed to develop a robotic vehicle that can sense metals ahead of it on its path similar to sensing land mines. The robot is controlled by a remote android application. Remote operation is achieved by any smart-phone/Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation. It consists of a metal detector circuit interfaced to the control unit that alarms the user behind it about a suspected land mine ahead. An Arduino kit is used for the desired operation. At the transmitting end using android application, commands are sent to the receiver to control the movement of the robot either to move forward, backward and left or right etc. At the receiving end two motors are interfaced to the microcontroller where they are used for the movement of the vehicle. The android application device transmitter acts as a remote control. While the receiver end Bluetooth device is fed to the microcontroller to drive DC motors via motor driver IC for necessary work. A metal detector circuit is mounted on the robot body and its operation is carried out automatically on sensing any metal underneath. As soon as the robot senses this metal it generates an alarm sound. This is to alert the operator of a possible metal ahead on its path

**KEYWORDS:** Metal Detector, Bluetooth Module, Motor Driver, Arduino.

## I. INTRODUCTION

In this project, we are using Bluetooth module to control robot movements wirelessly. It can be controlled wirelessly using phone having Bluetooth support with android based application software. The Bluetooth module is interfaced with Arduino Uno which takes proper actions for the movements of two DC motors. These motors are interfaced with Arduino Uno with motor driver L298N circuit. Depending upon commands, the vehicle has movements such as forward, reverse, left, right, stop etc. We are here using android enabled mobile phone. We are here using metal detector circuit.The project is designed to develop a robotic vehicle that can sense metals ahead of it on its path similar to sensing land mines. The robot is controlled by a remote using android phone. It consists of a metal detector circuit interfaced to the control unit that alarms the user behind it about a suspected land mine ahead. An Arduino Uno is used for the desired operation. From the android phone we can control the movement of the robot either to move forward, backward and left or right etc. at the receiving end two motors are interfaced to the controller where they are used for the movement of the vehicle. While the receiver decodes before feeding it another microcontroller to drive DC motors via motor driver IC for necessary work. Metal detector circuit is mounted on the robot body and its operation is carried out automatically on sensing any metal underneath. As soon as the robot senses this metal it generates an alarm sound. This is to alert the operator of a possible metal ahead on its path.

# International Journal of Innovative Research in Computer and Communication Engineering

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## II.        LITERATURE REVIEW

In this paper the author has experimented with android phone and controller. He has controlled the robot using Bluetooth and Arduino app for that certain strings are required to store in program, similar strings are created by android and by synchronizing all together the robot is controlled using smart phone.
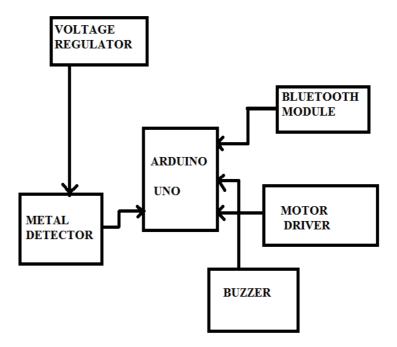
## III.        HARDWARE RESOURCES



Figure: Block Diagram of System

**A. Bluetooth module**: HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband

**B.Motor driver:** This is a high power motor driver perfect for driving DC Motors and Stepper Motors. It uses the popular L298 motor driver IC and has onboard 5V regulator which it can supply to an external circuit. It can control upto 4 DC motors, or 2 DC motors

**C.L293D Driver:** L293D driver is dual H-Bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since the take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive circuits.

**D.Buzzer:** buzzer is an electronic device commonly used to produce sound. Light weight, simple construction and low price make it usable in various applications like car/truck reversing indicator, computer, call bells etc.

**E.voltage regulator:** the three terminal regulators useful in wide range of application. It provides thermal overload protection and short circuit protection.

## IV.     SOFTWARE REQUIRMENT

**Arduino** is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

## V.     OBJECTIVES

A pilot study to assess whether modern metal detectors can reduce unnecessary radiation in searching for ingested metallic foreign bodies. The first objective is to enable mine action programme managers to make informed choices over metal detector selection. The second objective is to achieve good understanding by metal detector users of advantages of standardized testing and ideas. The third objective is the publication of independent and objective test results that can be used to update future issues of the metal detector.

## VI.     CONCLUSION

Generally, this project become as role that can give a contribution for all people with one system which is effective and accomplished to handle stolen, robbery and used for finding something that were lost. This is because, this project was builds using an Arduino Uno and also having a high performance to protect people asset from stolen and helps to find lost objects.

Modification in metal detector helps to distinguish different metal like ferrous and non-ferrous (gold, silver etc.) and also how much distance is that metal from coil.

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