

# AUTONOMOUS DEFENSE ROBOT IN METAL DETECTING AND CHEMICAL SENSING USING IOT

Now a days, terrorism is the most significant insecurity in the country and war between two countries becoming frequent. Methods of war between two countries like bio war, bomb blast and bomb traps in borders may caught many lives of soldiers and ordinary people.

During those cases, bombs are detected by the bomb squad in the army troop. In such condition squad members may die due to wrong operation or shortage time. To prevent these accidents in technology wise we can overcome these by engineers by using metal detecting robots in such conditions. Therefore, we can implement metal detecting and chemical sensing robots in national military defence system.

So, the main aim of this project is to design and demonstrate the metal detecting robot to determine the exact location of the bombs. Most of the bombs are made up of either chemical or metals, thus these robots are capabilities of detecting such bombs.



IOT is the main technology used in this system. After detecting the explosives using metal detector and chemical detecting sensors, the robot will send the information to the higher department using GSM which is inserted in the robot using IOT technology. Internet of things is the leading technology in current generation that describes the network of physical objects that are embedded with sensors, software and other technologies for the purpose of connecting and exchanging data with other devices and system over the internet. IOT system consists of sensors which talk to the cloud through some of connectivity. Once the data gets to the cloud, software processes it and then decide to perform an action.

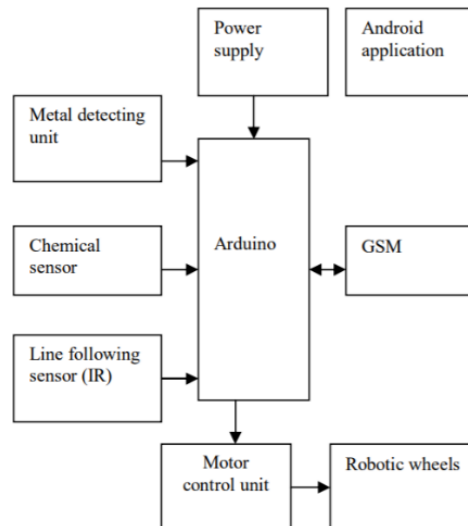
In this project the main role of robotic system is to improve and security to the national defence. The main components used in this device are Arduino uno (ATmega3), metal detecting unit, chemical sensors, Gsm sim 900A, IR Sensors, control unit.

## Methodology

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Arduino uno is the main controlling unit of the robot system, which is programmed using specific language or c programme. Robotic system is equipped metal detecting sensor which detect the metals which are hidden under the ground. Chemical sensors are also equipped which has the capability to detect the ordinary minerals in soil and chemicals which are hidden under the ground. Global system for mobile communication is inserted to main body which is controlled by Arduino and used to control robotic wheels. IR sensors consists of transmitter and receiver, in which transmitter send the data in the direction of the motion and receives the data back from surface of the object.



### ➤ MODES OF OPERATIONS

There are two types of operations,

- 1) AUTOMATIC – working by itself with little or no direct human control.
- 2) MANUAL - working done with the hands.

Arduino in the system is programmed to our choice and automatic switching off is possible. In automatic mode, the system operates continuously and updates each and every interval of time. In manual mode, the system is operated by either remote or android application. The Arduino is also programmed to switch manual to automatic. In absence of user, the robot can be switched to automatic mode using android application.



### CONCLUSION

The robot was considered to detect the metal which are hidden. It consists of metal and chemical sensors, after detecting the metal, it alarms the user using GSM under IOT technology. The robot successfully detect the metal and chemical and mainly used in national defence.