

LANDMINE DETECTON ROBOT VEHICLE

*A project report submitted in partial fulfillment of the requirements for the 6TH
semester of the degree of*

BACHELOR OF TECHNOLOGY in ELECTRONICS ENGINEERING

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PRINCIPAL:-

As a principal in the field of robotics and technology, I am deeply committed to leveraging innovation to address critical global challenges. One such challenge is the detection and removal of landmines, which pose a significant threat to civilian populations and impede socio-economic development in affected regions.

In this role, I envision the development and deployment of Landmine Detection System Robots as a transformative solution to this pressing humanitarian issue. These robots combine advanced sensing technologies, artificial intelligence, and robotics to detect and neutralize landmines in a safe, efficient, and cost-effective manner.

Components used:-

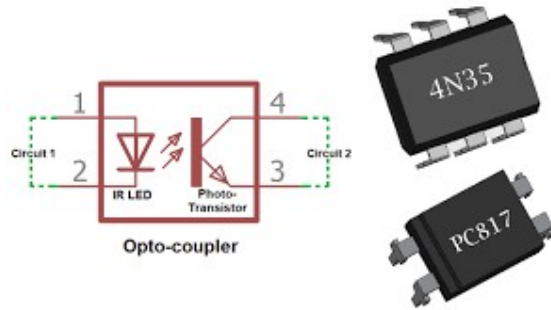
1.COPPER COIL:-

Copper coils are fundamental components in various electrical and electronic systems, renowned for their conductivity, durability, and versatility. These coils are typically formed by winding copper wire into a spiral or helical shape, creating a compact and efficient conductor.



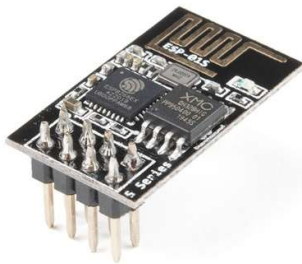
2.OPTOCOUPLER:-

An optocoupler, also known as an optoisolator or photocoupler, is an electronic component that provides electrical isolation between two circuits by using light to transmit signals. It consists of a light-emitting diode (LED) and a photodetector, typically a phototransistor or photodiode, contained within a single package.



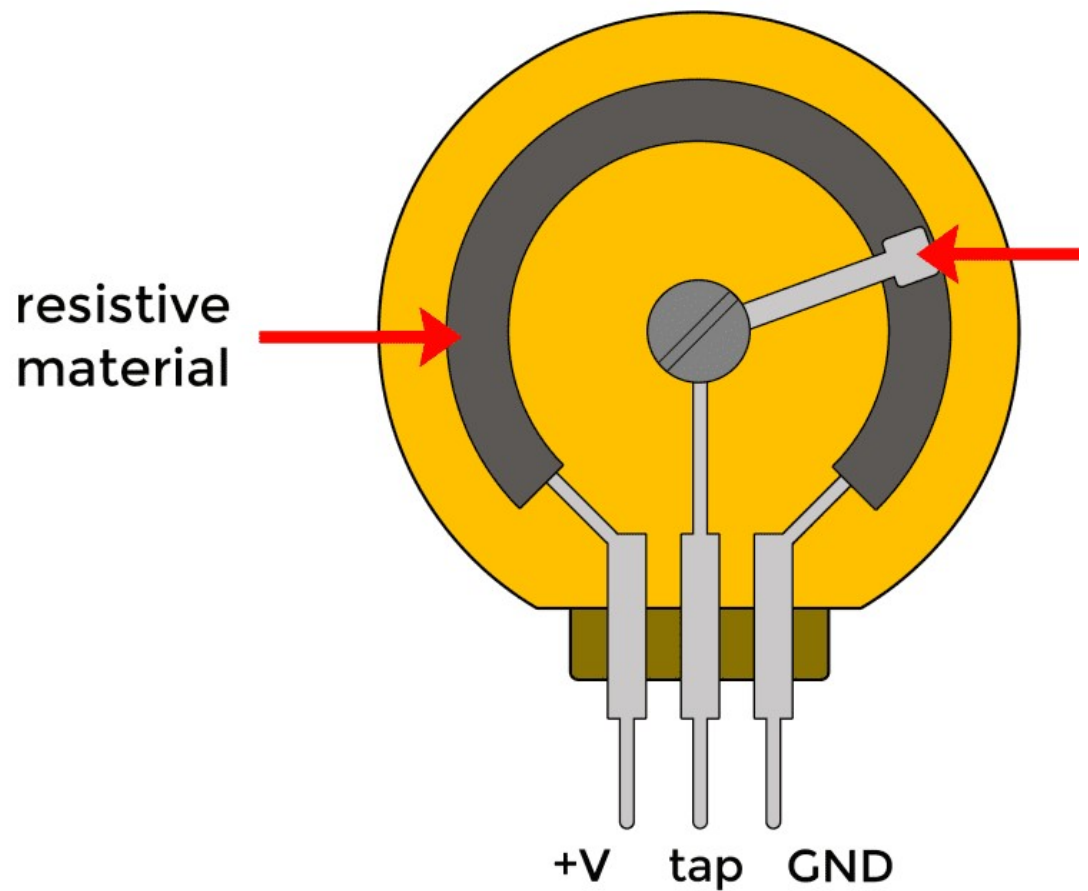
3.WIFI MODULE:-

A Wi-Fi module is a compact electronic component that enables devices to connect to wireless local area networks (Wi-Fi networks). These modules integrate Wi-Fi functionality into electronic devices, allowing them to transmit and receive data wirelessly over Wi-Fi networks. Key features and applications of Wi-Fi modules include:



4.VARIABLE RESISTANCE:-

A variable resistance, also known as a potentiometer or rheostat, is an electronic component that allows for the adjustment of resistance within an electrical circuit. It consists of a resistive element and a movable contact (wiper) that can be adjusted to change the resistance value.



5. Jumper wires:-

A jump wire (also known as jumper, jumper wire, DuPont wire) is an [electrical wire](#), or group of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a [breadboard](#) or other prototype or test circuit, internally or with other equipment or components, without soldering.



INTRODUCTION:-

In a world marred by the remnants of conflict, the scourge of landmines continues to pose a grave threat to civilian lives, impeding progress and perpetuating instability in affected regions. Amidst this challenge, the emergence of Landmine Detection Robots heralds a new era of innovation and hope—a testament to humanity's ingenuity and commitment to addressing pressing global challenges.

This introduction serves as a gateway to the realm of Landmine Detection Robots, illuminating their significance, capabilities, and transformative potential in the realm of humanitarian demining efforts. These robots represent a convergence of cutting-edge technology, advanced robotics, and humanitarian imperative—a formidable force in the fight against the deadly legacy of landmines.

At their core, Landmine Detection Robots are sophisticated robotic systems equipped with state-of-the-art sensors, artificial intelligence, and autonomous navigation capabilities. Designed to traverse hazardous terrain with precision and efficiency, these robots are tasked with the critical mission of detecting, mapping, and neutralizing landmines with unparalleled accuracy and safety.



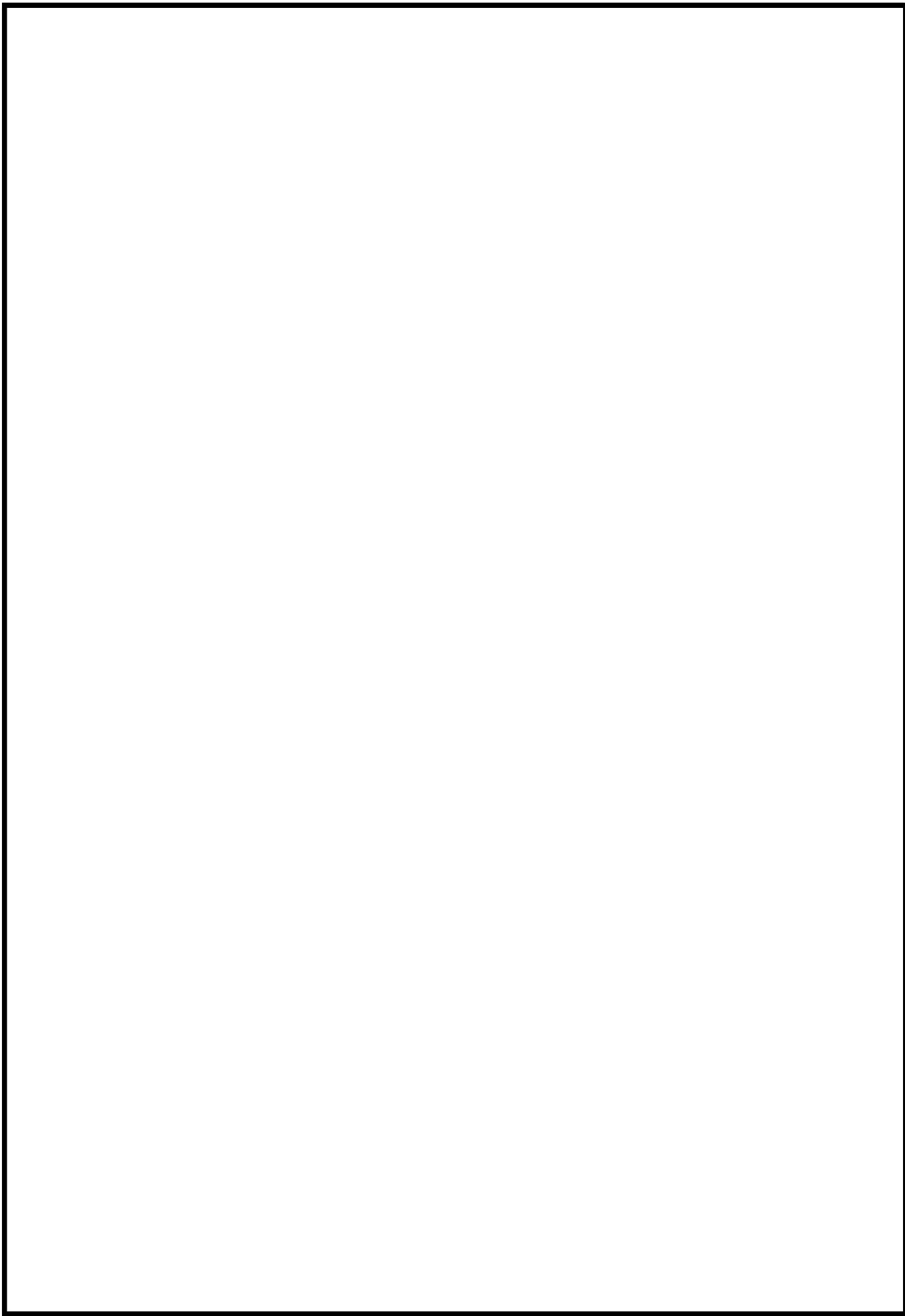
Lithium-ion Battery:-

is the most popular rechargeable battery chemistry used today. Lithium-ion batteries power the devices we use every day, like our mobile phones and electric vehicles.

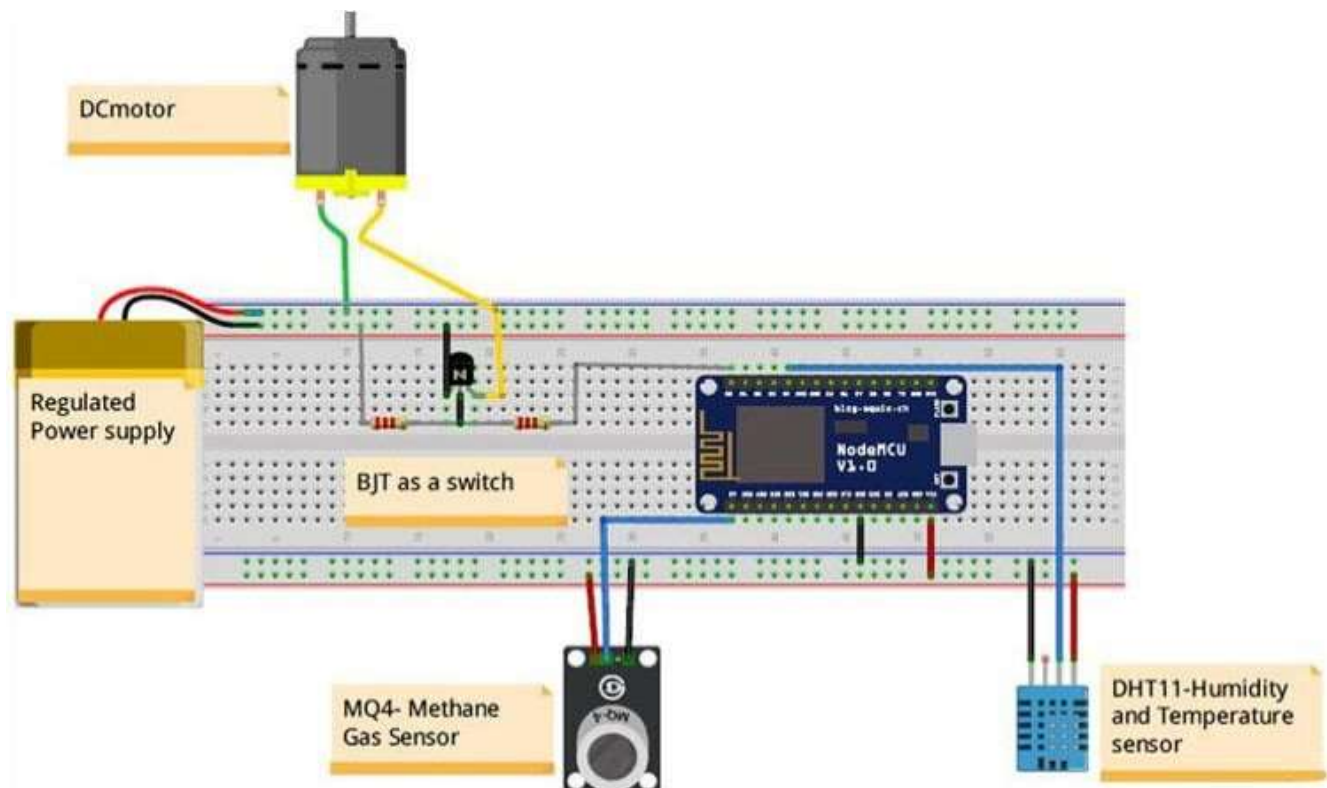
GEARED MOTOR WHEEL:-

A gear motor is a mechanical system consisting of an electric motor and a gearbox containing a series of gears

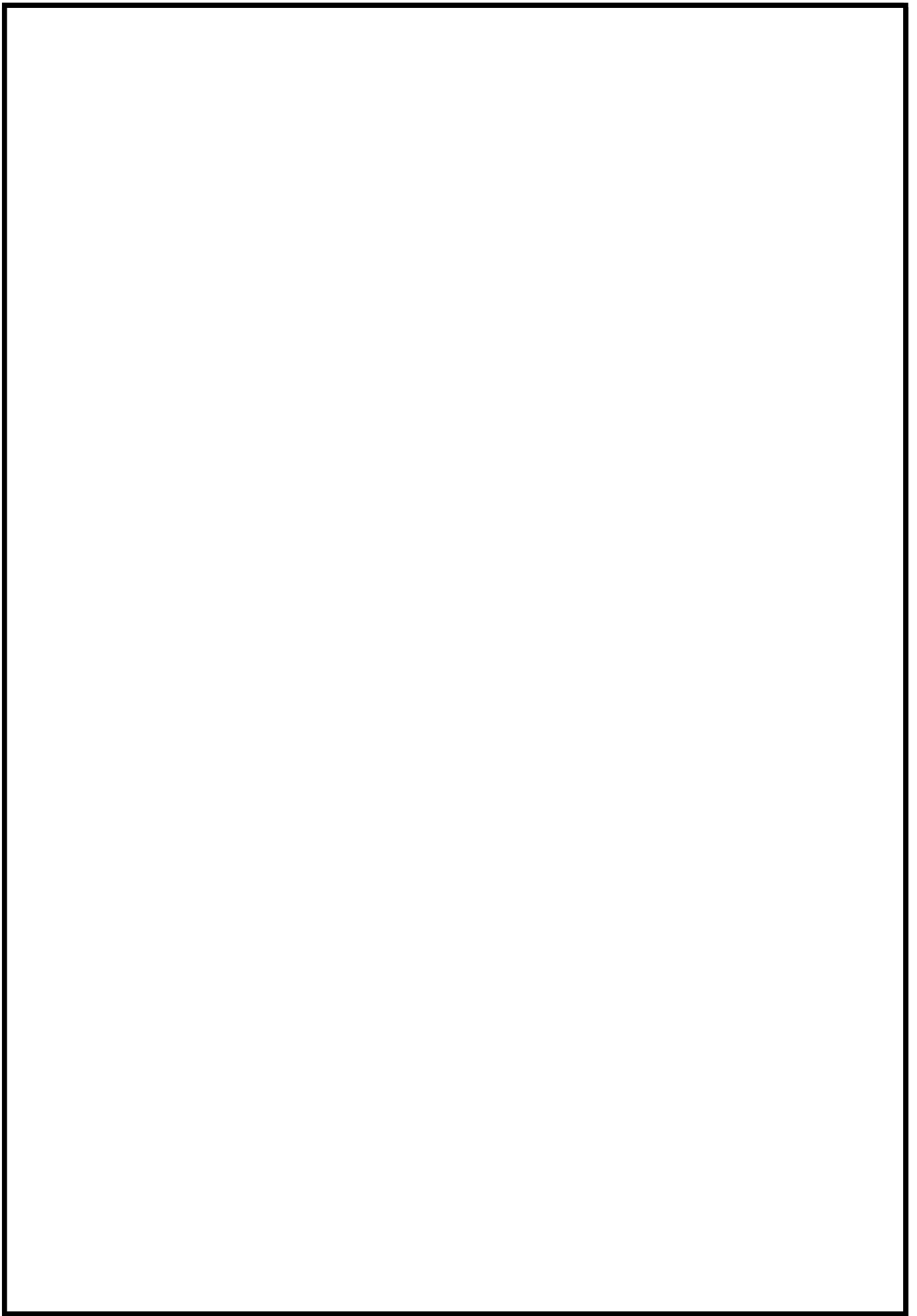




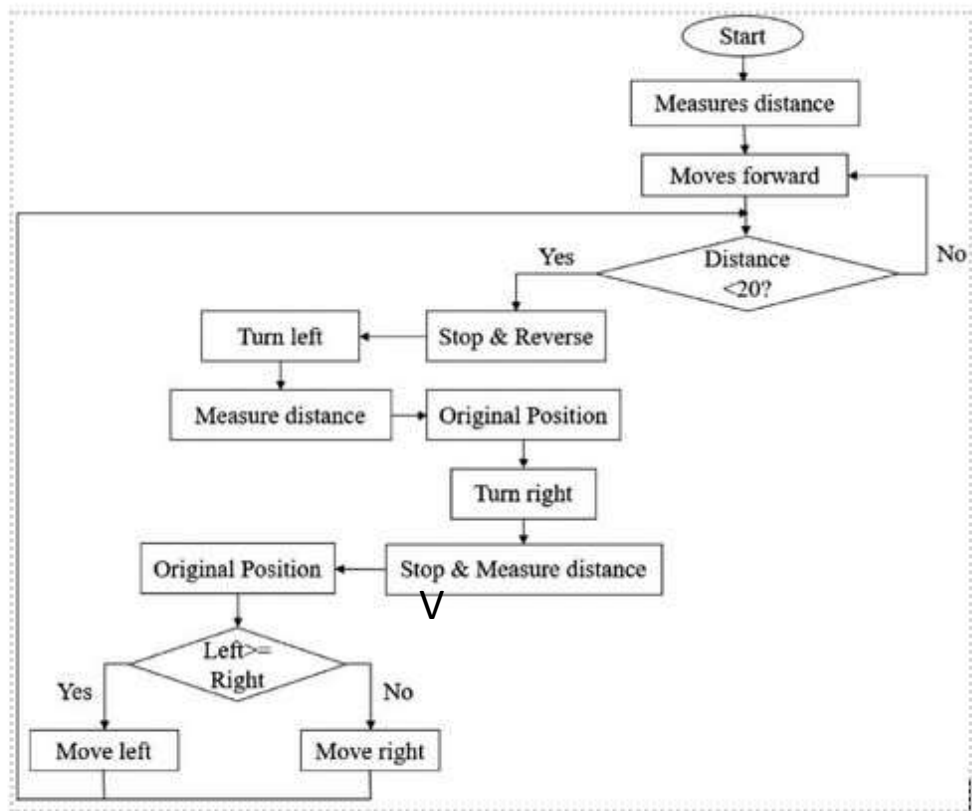
CIRCUIT DIAGRAM:-



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FLOW CHART:-



COMPONENTS REQUIRED: -

☐ **COPPER COIL**

☐ **OPTOCOUPLER**

☐ **Connecting wires**

☐ **JUMPER WIRES**

☐ **LITHIUM ION BATTERY**

COST OF COMPONENTS:-

S NO	COMPONENTS	QTY	PRICE
1	COPPER COIL	1	300/-
2	OPTOCOUPLER	1	300/-
3	VARIABLE RESISTANCE	1	60/-
4	LITHIUM ION BATTERY	1	120/-
5	JUMPER WIRE	10	20/-
6	WHEELS	4	200-

TOTAL COST =
1000/-

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Cisco Press, 2017
2. Internet of Things – A hands-on approach By Arshdeep Bahga, Vijay Madisetti, Universities
Press, 2015
3. Internet of Things: Architecture, Design Principles And Applications By Rajkamal, McGraw Hill
HigherEducation
4. The Internet of Things – Key applications and Protocols By Olivier Hersent, David Boswarthick, Omar Elloumi and Wiley, 2012

Advantages:

The product will reduce physical labor,

The speed of work will be faster,

No need for manual operation,

The product will be easy to operate,

The product will be handy.

Implementation

Implementing Landmine Detection Robots represents a pivotal advancement in the realm of humanitarian demining efforts. The process begins with meticulous design and development, where interdisciplinary teams collaborate to create robots equipped with cutting-edge sensor technologies and autonomous navigation systems. Extensive field testing follows, involving simulated and real-world minefields to validate performance and refine functionalities in partnership with demining organizations and local communities. Operational deployment necessitates the establishment of protocols and training programs to ensure safe and effective utilization by demining teams. Data analysis and mapping play a crucial role, leveraging software tools and algorithms to interpret robot-collected data and generate actionable insights for demining operations. Continuous improvement and innovation are integral, driving ongoing collaboration with research institutions and stakeholders to enhance robot capabilities and address emerging challenges. Through these steps, the implementation of Landmine Detection Robots promises to revolutionize demining efforts, offering a path towards safer communities and a world free from the threat of landmines.

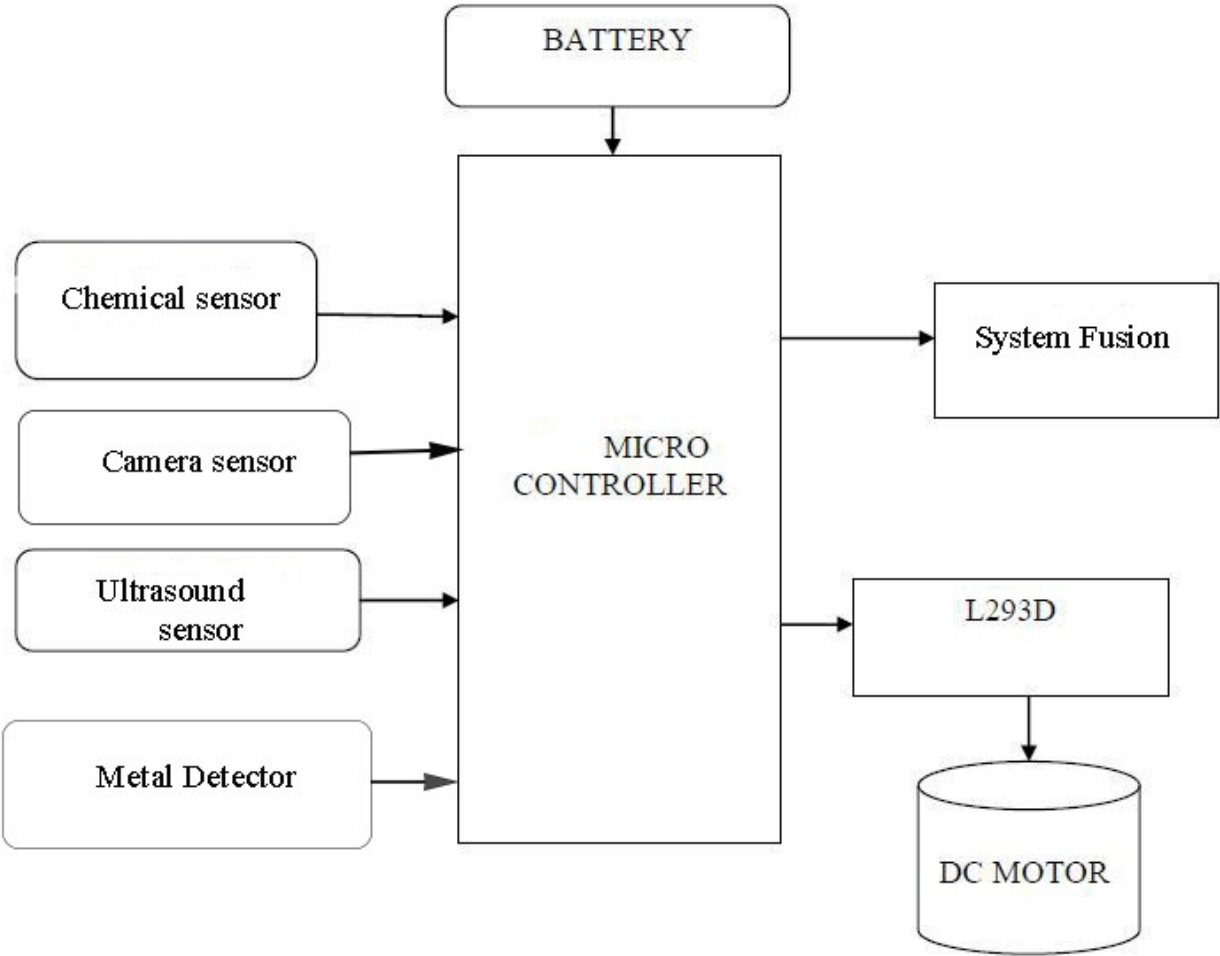
TECHNICAL SPECIFICATION:-

The technical specifications of Landmine Detection Robots encompass a comprehensive array of features designed to ensure optimal performance and reliability in demining operations. These robots are equipped with advanced sensor technologies, including ground-penetrating radar, metal detectors, and thermal imaging cameras, to accurately detect and identify landmines buried beneath the surface. Additionally, they incorporate sophisticated autonomous navigation systems with obstacle avoidance algorithms, enabling safe traversal through hazardous terrain without human intervention.

Furthermore, Landmine Detection Robots are designed to withstand rugged environmental conditions, with robust construction and sealing to protect internal components from dust, moisture, and debris. They feature high-capacity batteries or power sources capable of sustaining prolonged operation in remote and off-grid areas. Remote control capabilities allow operators to monitor and control the robot from a safe distance, minimizing the risk to human operators.

The data collected by Landmine Detection Robots is processed in real-time using onboard or cloud-based computing resources, leveraging machine learning and artificial intelligence algorithms to analyze sensor data and identify potential threats with high accuracy. Comprehensive mapping and reporting functionalities provide demining teams with detailed information on the location and status of detected landmines, facilitating safe and efficient clearance operations.

BLOCK DIAGRAM FOR LANDMINE DETECTION ROBOT:-



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