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Landmine Detection Robotic Vehicle with GPS Positioning Using Arudino

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A B S T R A C T

Landmines endanger the environment and human life gravely. This project intends to create an Arduino-based robotic vehicle for landmine detecting. A GPS gadget tracks the robot's whereabouts and a metal detector finds concealed landmines. It scans regions for concealed explosives either autonomously or under remote control. The technology notifies the precise GPS location when a landmine is found, hence enabling safe disposal. This affordable and effective approach lowers human risk and increases safety in dangerous locations.

The device offers real-time data on landmine sites, hence facilitating safe and effective demining operations.

INTRODUCTION

Buried underground, landmines are hazardous explosives that significantly endanger the environment and people. Humans find it challenging and dangerous to locate and remove them. This project aims to design a Landmine Detection Robotic Vehicle capable of safely locating landmines using a metal detector and tracking their location with GPS. Arduino controls the robot, which runs on its own or may be operated remotely. Finding a landmine sets off an alarm communicating its precise location, therefore enabling professionals to safely remove it. Reducing human danger allows this strategy to make landmine detecting safer, easier, and more efficient. Especially with land development or natural disasters, landmine clearance is a major issue many nations all around fight with.

LITERATURE REVIEW

1. Supriya Devade, Prajakta Patil , Prof. A. B. Ingole., "Automatic Landmine Detection Using Robot" (2024) A metal detector finds buried explosives; the robot operates on an Arduino control system. It can travel autonomously or be controlled from a distance, therefore lowering human danger. A GPS system shows the precise location of found landmines, hence ensuring perfect tracking. By way of notifications, the system enables safe mine removal
2. Vinayak Gupta , Uddeshya Srivastava , Aniket Tiwari , Shivam Singh , Kishan Kumar "Landmine Detector Robotic Vehicle," Robot landmine detection car Usually buried, mines are explosive devices meant to cripple or kill hostile targets. Most land mines are set just below the surface and detonated by trip-wires or pressure. Usually, they have several metal parts that could help one find them.

PROBLEM STATEMENT

The issue statement for a landmine detecting robotic vehicle with GPS positioning utilizing Arduino is finding and identifying hidden landmines, which helps to lower the chance of human deaths. The robotic vehicle should be able to traverse a terrain, locate landmines, and transmit real-time location data via GPS.

PROPOSED METHOD

Buried under the topsoil, this Landmine Detection Robotic Vehicle locates mines using a metal sensing coil. Its tracked construction enables it to cross the most challenging and wild areas. Ultrasonic sensors let this robot locate obstacles. A metal detector coil lets this self-driving car find landmines. A twin motor tracked robotic vehicle attaches the coil and surveys an area autonomously using an ultrasonic sensor for obstacle detection. Once found, the vehicle SMSs the registered LCD with the landmine's GPS location allowing mine locations to be plotted.

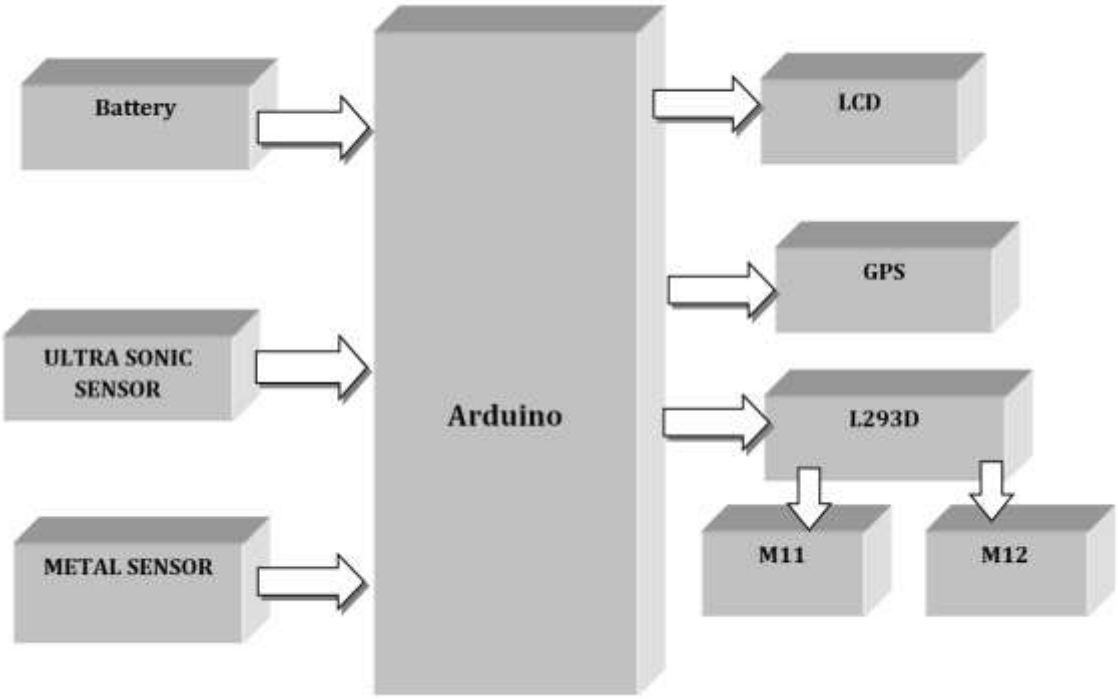

Fig. 1 -Block Diagram of Proposed Method.

WORKING PRINCIPLE

Running on Arduino, the landmine detecting robotic vehicle with GPS positioning consists of a metal detection sensor, GPS module, motorized mobility, and wireless connection for effective landmine identification and location tracking. A metal detector sensor on the robotic vehicle searches the ground for metallic items either independently or under remote guidance. The sensor notifies the Arduino microcontroller of a metal item's detection; it then processes the data to validate the outcome. At the same time, the GPS module remembers the location for later question and gets the precise coordinates of the chosen item. Equipped with ultrasonic sensors that identify impediments, the car may avoid accidents and hence guide itself safely. An inbuilt LCD panel may show the found landmine position; Bluetooth, Wi-Fi, or LoRa link can wirelessly relay it to a remote system. Particularly for military and humanitarian demining activities, this research helps to reduce human risk while improving efficiency in locating and mapping dangerous areas. The technology offers a good option for safe landmine detection by means of real-time data transfer and automated integration. .

6. RESULTS

The goal of the study is automatic landmine identification using sensor data acquired by mobile scanning equipment. Thus, the present scanning platform LADERO was adequately enhanced in terms of installing required control hardware and sensors and operating the newly created control software. Using the experimental data accessible from public databases of landmine signatures, the landmine detection task was first meticulously researched. This study identified several particular merits of this work and let one create an ideal multi-stage strategy.

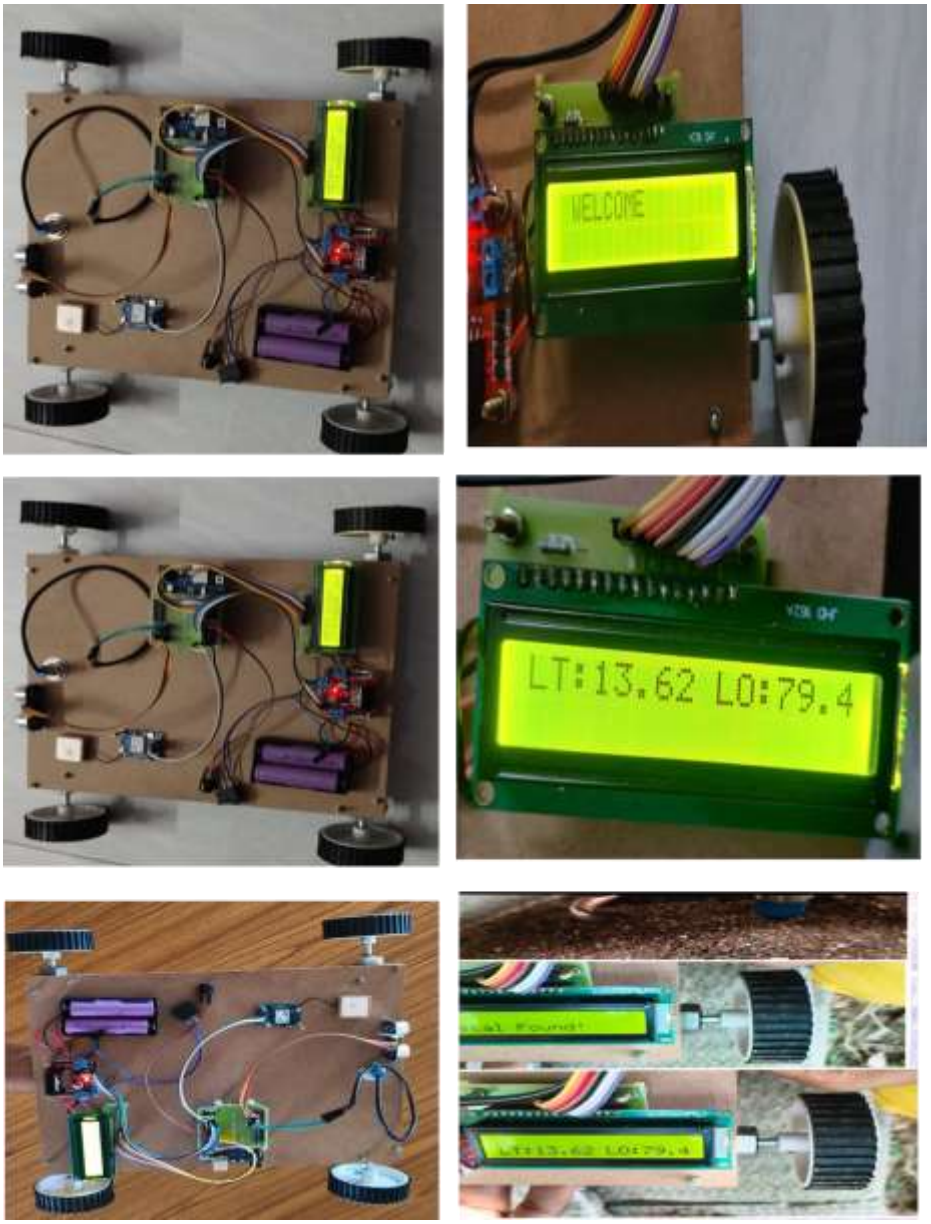

Fig.2- Results

7. CONCLUSION

Using Arduino, the landmine detecting robotic car with GPS tracking provides a creative approach to securely find and identify landmines. By combining a metal detector or other sensors with an Arduino-based control system and GPS module, the robot may autonomously tour a designated region and deliver real-time location data. GPS placement guarantees correct reporting and provides exact mapping of found landmines, hence enabling safe demining operations. This method simplifies landmine removal operations, lowers human danger, and improves safety, making it a useful tool for military and humanitarian purposes.

REFERENCES

1. Priti Lalge , Supriya Devade, Prajakta Patil , Prof. A. B. Ingole., “Automatic Landmine Detection Using Robot” International Journal Of Innovative Research In Technology ISSN: 2349-6002 Volume 10 Issue 11 April 2024.
2. Vinayak Gupta , Uddeshya Srivastava , Aniket Tiwari , Shivam Singh , Kishan Kumar “Landmine Detector Robotic Vehicle,” International Journal for Multidisciplinary Research (IJFMR) Volume 5, Issue 3, May-June 2023.