

Land mine detector

Abstract

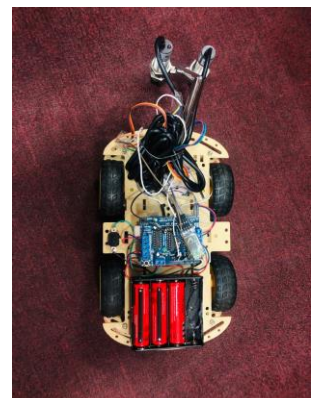
The Sri Lankan civil war lasted from 1983 to 2009, and is known as one of the goriest events in the history of Sri Lanka. It is well known that this war largely affected northern and eastern parts of the island. Even a decade has passed since the end of the war, many displaced families still cannot return home because their land is still contaminated with Explosive Remnants of War (ERW). According to an estimation done by the Sri Lankan Army 1.6 million landmines have been laid in Sri Lanka. Besides, the Landmine Monitor says over 20,000 people have been killed or injured by landmines and other ERW. The cruel character of the landmines is that they can lie dormant for years and even decades until their detonating mechanism is triggered by external factors (person, animal, or vehicle). Hundreds of thousands of mines have already been cleared, in the efforts of several landmines clearance groups since 2002. However, the demining action in Sri Lanka is carried out manually and this makes the demining task very risky, timeconsuming, and incredibly complex. Further, unexpected factors like floods, landslides, and dense growth of bushes or trees alter and hide the original location where the landmines buried. In this situation demining action is more cumbersome than the normal demining process. Therefore, this research study aims to detect unexploded landmines that are scattered in the lands with the help of a remote control vehicle. The remote control vehicle is made up with an Arduino microcontroller, two Inductive proximity sensors, motors, and Bluetooth module. In addition, an android application is developed to communicate and control the vehicle with the help of Bluetooth technology. An arm connected with the inductive proximity sensors is fixed in front of the vehicle and it continuously rotates between 180 degrees. Whenever the sensors detect the landmines the microcontroller activates the buzzer to alert the clearance group. Therefore, the clearance group can easily follow the path the vehicle passed and remove the landmine safely. Furthermore, its less weight allows it to move anywhere in the searching land without triggering landmines. Above all, this system reduces the explosion accidents and supports to the landmine clearance group with user-friendly controls.

Purpose of our project

Land mine detection is a growing concern due to the danger of buried landmines to people's lives, economic growth, and development most of the injured people have no connection with the reason why the mine was placed. So we try to save human lives. That's why we take this project.

The devices we used

- The robot has Inductive proximity sensors can only detect metal targets. They do not detect non-metal targets such as plastic, wood, paper, and ceramic. Unlike photoelectric sensors, this allows an inductive proximity sensor to detect a metal object through opaque plastic.
- Buzzer -for warning alert metal detector for detection of mine.
- Battery
- HC-05 Bluetooth Module
- Arduino microcontroller



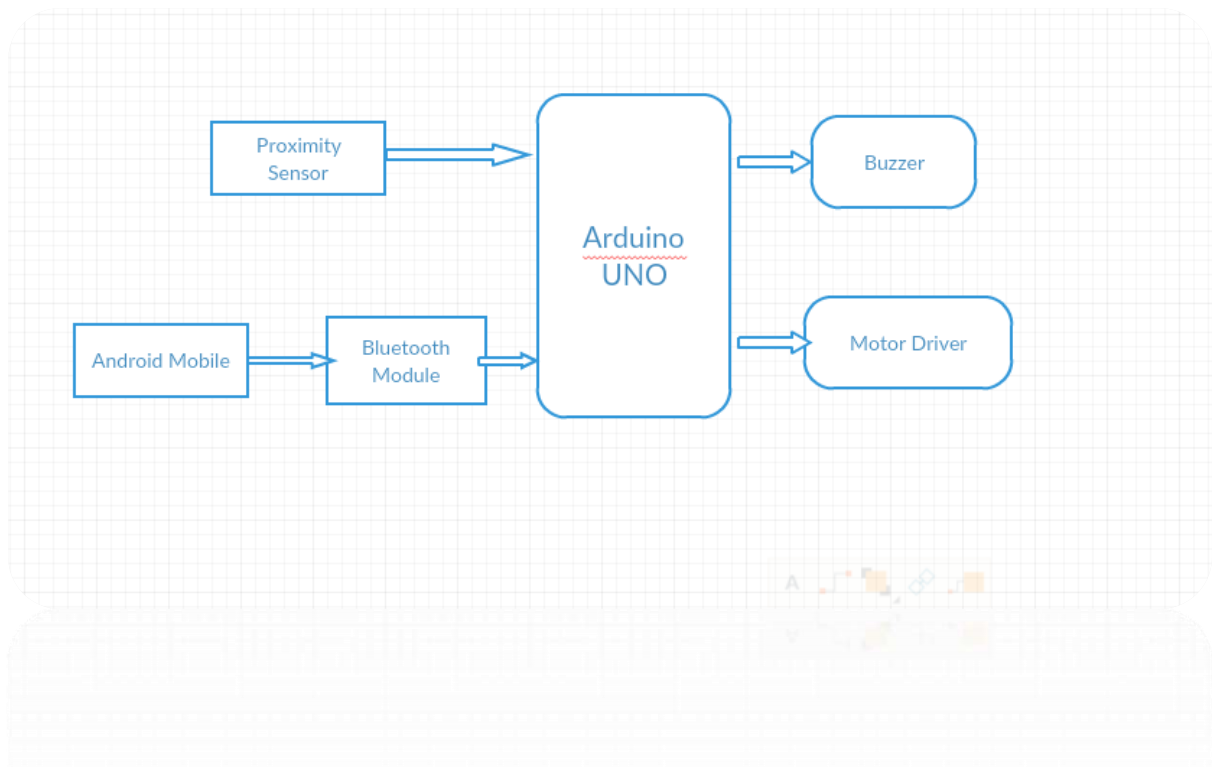
Software Application



They are mainly two parts in this project such as the electronic part, Mechanical part.

Electronic part the simulation of all the electronic part like Arduino, proximity sensor, etc are done using the Proteus software, for simulation Arduino UNO library have to import first to display then sensors motor has to imported.as pin configuration is stated above the connections are made in the software later this program is loaded in the microcontroller for simulation.

Block diagram



In this project, Arduino is interfacing with different hardware like a motor driver, HC05 Bluetooth Module, proximity sensor. When the sensor sense any metal body in its range it creates an analog value by the respect of the distance between the sensor and metal body. Then the sensor sends the analog value into the Arduino board. Arduino also creates an Arduino pin which is connected with a buzzer. After detecting the metal, the buzzer will beep. For moving the motor we can remotely do it.

Conclusion and future scope

This paper has described the overall design for a wheeled robot for land mine detection purpose and implementation the wheeled is less expensive, robust and is it a helpful tool in for military for surveying and monitoring purpose.

The future scope is concentrated on the improvement of the body designs by placing a suspension system to over shock from the uneven surface. The robot is equipped with a robotic arm for diffusion purposes.

As also we can make some future improvements like adding a GPS module. So once a landmine is detected, we can send the location using a GPS module to the smartphone. So bomb disposal experts can neutralize the bomb manually. And also we can stop the vehicle when the vehicle finds a bomb. so we know exactly where the bomb is. So disposal experts can manually go there and neutralize the bomb

