

Pick and Place Robotic Vehicle also used for IED Detection

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Abstract- The popular concept of a robot is of a machine that looks and works like a human being. The remote controlled robots are plenty, especially in specific areas where people can not go there to perform specific task, there these robots are playing major role. The system designed here can be used for picking any small object from the hazardous place. The main advantage is that the Robot can be controlled from the safe zone through the remote monitoring designed using wireless video camera.

The vehicle will be moved in all directions and the robotic arm is also controlled. This robot is equipped with a gripper mechanism at its front side for picking and placing of an object. In addition, the vehicle is also equipped with a metal detector for detecting the explosives (bombs). Whenever the bomb is detected, automatically the vehicle will be stopped .This entire mechanism can be viewed in the television set at the control unit as the vehicle will be transmitting the live video signals through the wireless video camera.

Index Terms- Robotic Vehicle, Arduino UNO, Joint Actuator, Bluetooth, Pick and Place, metal detector, Wireless camera

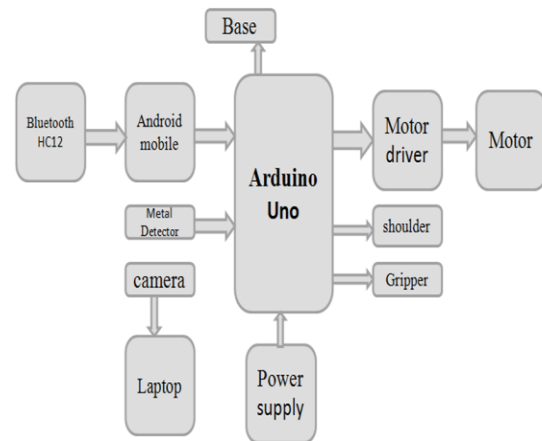
INTRODUCTION

This project is aimed to detect the presence of any metallic mine in the field, it can detect the explosives or bombs. Sometimes, while searching for the explosives, all of sudden it may blast that leads to major damages. To save the lives of our hero's (those who are searching for the explosives, generally called as bomb squad or search party) we need a special kind of metal detectors, by which squad can stay away from the explosives.

In this regard this project work is taken up, which functions the performance of mobile Robot to detect metal mine or to detect any explosives that contains metallic objects like nails, balls, sharp metal pieces, etc. and also the fire in a particular location. Here for the demonstration purpose a prototype module is

constructed for detecting the metal mines and with slight modifications the same vehicle can be used for both the applications.

BLOCK DIAGRAM



Arduino UNO

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino. The Board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE.

Motor driver (L293D)

The L293D is assembled in a 16 lead plastic package which has 4 center pins connected together and used for heat sinking. The L293DD is assembled in a 20 lead surface mount which has 8 center pins connected together and used for heat sinking.

Camera module

It is used to see the front of the robot.

Bluetooth module

Wireless serial port communication module is a new-generation multichannel embedded wireless data transmission module. Its wireless working frequency band is 433.4-473.0MHz, multiple channels can be set, with the stepping of 400 KHz, and there are totally 100 channels.

Metal Detector

A metal detector is an electronic instrument which detects the presence of metal nearby. Metal detectors are useful for finding metal inclusions hidden within objects, or metal objects buried underground.

Gripper

A gripper is a device which enables the holding of an object. A gripper enables holding, tightening, handling and releasing of an object. A gripper can be attached to a robot or it can be part of a fixed automation system.

REFERENCES

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- [3] Hand Gesture Recognition Bomb Diffusing Surveillance Robot is paper of Sagar Radive national Conference on Emerging Trends in Engineering & Technology 2012. the hand gesture recognition makes the robot more user friendly but also there is need of Improvising the range of wireless communication so as to be able to put to a wider use.
- [4] Prasanna Balaji & H. Goutham, International Journal on Theoretical and Applied Research in Mechanical Engineering (IJTARME), 2013 this also helps on remote bomb detonation and automatic bomb detection.