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IOT Based Camouflage Surveillance Robot

[1]Srikanth M S , [2]Dr Jitendranath mungara, [3]Deekshitha S N, [4]Divya Khandekar, [5]Bharath Kumar O
[6]I V S Mahesh Varma

[1]Assistant Professor, Department of ISE, Nagarjuna College of Engineering and Technology, Bangalore, Karnataka, India

[2]Principal and Professor, Department of CSE, Nagarjuna College of Engineering and Technology, Bangalore, Karnataka, India

[3,4,5,6] B E Students, Department of CSE, Nagarjuna College of Engineering and Technology, Bangalore, Karnataka, India

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ABSTRACT

In today's era, lot of expenses are made in area of defence and protection using IOT for the purpose of accommodating primary safety and security measures for safeguarding the army men from terrorist attacks. Currently lot of innovations and creativity are occurring in the zone of defence to decrease loss of army men lives. One such invention is Camouflage Robot. The objective of this paper is to design Camouflage Robot which can reproduce colour independently according to the colour of it's ground area. This principle helps robot to protect itself from attackers and robot movements are handled on app on android phone by person.

Keywords : IOT, Camouflage Robot

I. INTRODUCTION

In area of defence, military forces are using technological development for bringing down the possibility of the casualties and to defeat their opponent with the development of advanced and modern technology. The Camouflage Robot can be used to replace soldier in war fields for performing high frequency, accuracy, repetitive and risky jobs. Camouflage Robot is efficient and effective in area of strength, calculations, capacity and capabilities. The main intention behind the Camouflage Robot is to minimize the number of humans loses in the military operations, sting operations, terrorist attacks and many such operations which results in human death. Camouflage Robot is operated using seven phases.

1. The direction and movements of robot are controlled on android phone on blynk app by using IOT technology. 2. Gas Sensor helps in detecting any sort of gas leakage present in the air. 3. Infra Red Sensor helps in detecting motion. 4. Metal detector sensor detects landmines and metallic substances like bombs and guns. 5. Obstacle sensor is activated when robot movement is hit by any obstacles. 6. Colour sensor detects the colour of the surroundings with the help of RGB Led matrix. 7.

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GPS and GSM helps in tracing surrounding and nearby circumstances of robot.

II. LITERATURE SURVEY

Premkumar M proposed new system called Intelligent Unmanned Robot which helps in tracing the intruder using Zigbee network. This system helps in saving human life and reduces human deaths in war fields. [1]

Dipak Patil et al., implemented system using Bluetooth for reducing casualties at defence. It uses Passive Infrared Sensor to trace the unauthorised persons. It gets real time data by using camera and video with the help of Bluetooth module. [2]

Akash Ravindran et al., proposed system using Bluetooth module through UART protocol. It is controlling movements of robot using remote button in the app on mobile. Through wireless camera, GPS and GSM, real time data regarding robot's surrounding area is sent to app. [3]

P. Hymavanthi et al., implemented embedded robot system which can be even operated in natural disaster area and helps in finding the people who are stuck in the risks of natural disaster. [4]

III. HARDWARE REQUIREMENTS

Arduino UNO – It is open-source platform which is used to make electronic projects using ATmega software.

NodeMCU – It has built-in wifi module which helps to connect bylnk application and get notification on app.

PIR Sensor – It stands for Passive Infrared Sensor. It helps in detecting any sorts of movements within certain boundary and range of the sensor.

Metal Sensor – It helps in detecting metallic substances like guns and bombs.

Gas Sensor – It helps in detecting any sort of dangerous gases present in the air.

Obstacle Sensor – It helps detecting obstacles that get founded during the movement.

Colour Sensor – It detects the colour in format of RGB scale.

IV. SOFTWARE REQUIRENTS

Arduino IDE – It is open source and freely available from google to write the code for project.

Blynk – It is platform, with android apps which helps in controlling Arduino over the cloud.

V. SYSTEM IMPLEMENTATION

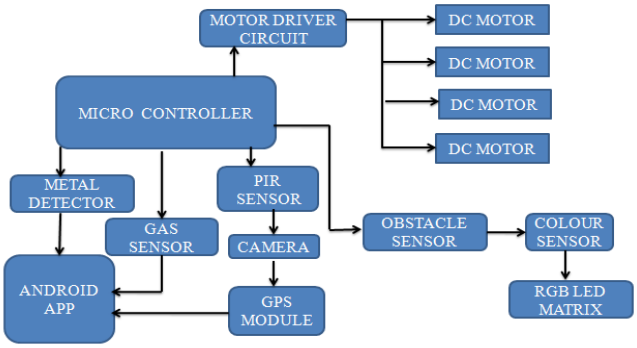

Fig : 5.1 System Architecture of IOT Based Camouflage Surveillance Robot

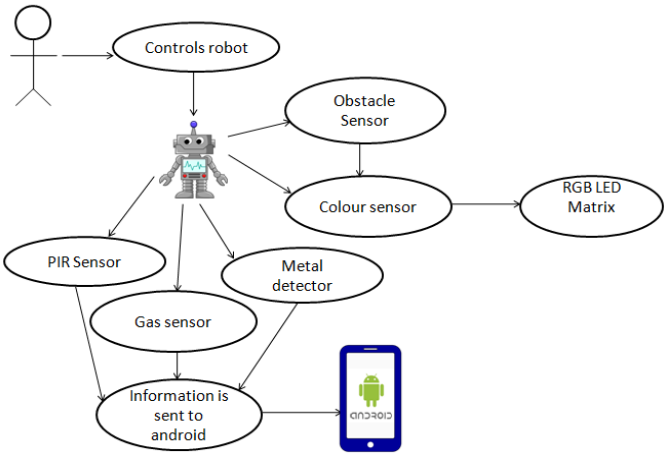

Fig : 5.2 Use Case Diagram of IOT Based Camouflage Surveillance Robot

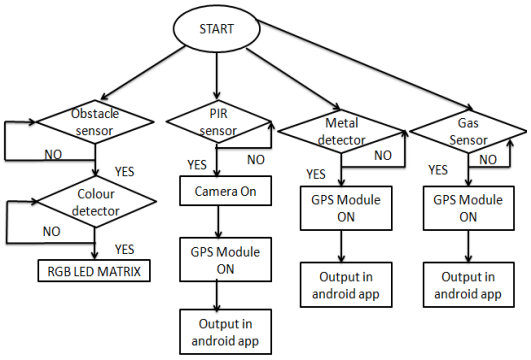

Fig 5.3 Data Flow Diagram of IOT Based Camouflage Surveillance Robot

Microcontroller used in this project is Arduino UNO and NodeMCU. It consists of metal detector which detects landmines and metallic substances like bombs and guns and sends information to android app. It consists of gas sensor which detects gas leakage present in the air and sends information to android app. It consists of Passive Infrared sensor which detect the movements of objects and people and send notification to android app. When the robot movement is hit by an obstacle, initially it is detected by the obstacle sensor and buzzer makes sound. Colour sensor detects the colour of obstacle and through RGB Led matrix, robot changes it's color so that robot can protect itself from attackers. Relay act as switch to turn on Color sensor.

VI. RESULTS

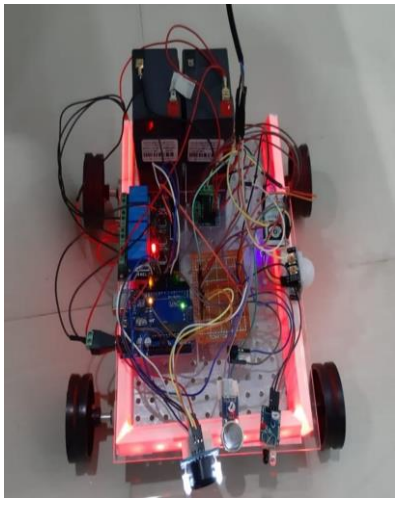

Fig : 6.1 Camouflage Robot is camouflaged to red colour.

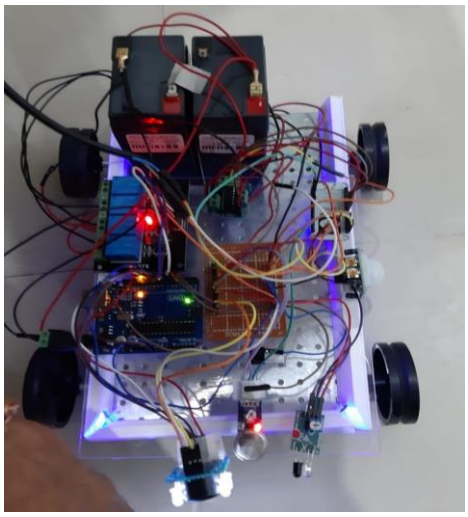

Fig : 6.2 Camouflage Robot is camouflaged to blue colour.

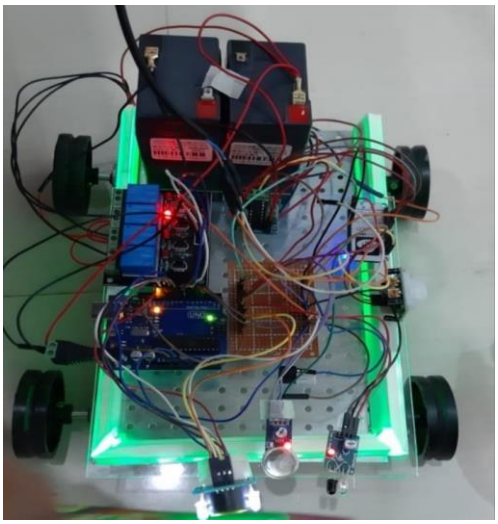

Fig : 6.3 Camouflage Robot is camouflaged to green colour.

VII. CONCLUSION

To conclude, It plays essential role in rescuing the human loses and also injuries and destruction that take place during the disaster. Camouflage Surveillance Robot can reduce human losses in military operations or terrorist attacks. It can test various security systems that is present in the market and helps in measuring product efficiency. During wildlife photography, hidden pictures or video shots are taken using this robot.

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