# Camouflage Technique Based Army Robot

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**Abstract-** *At this juncture, the surveillance of global outskirts is plight. Securing the frontier every moment is a life threatening and a daunting task. An essential need for the circumstances is a robotic involuntary of detecting the trespassers and reporting to the command center (Blynk). Most of these organizations make use of these robots to perform perilous mission. In instant and Arduino operating system with Blynk monitoring through IoT has developed which will rescue human life, reducing physical delusion. The spy robot system comprises of Arduino, sensors and vision camera. The counsel with regard of detecting the human locomotion by PIR sensor and wireless camera to capture motile body and to notify the Blynk application. The activity of the robot can be controlled spontaneously using Obstacle sensor, where the data can be accessed by the user present in the command center. Hence, eliminating the collision. The vouchsafe combines sensory and remote operating system for effective robotic reliability.*

*Keywords*- surveillance, Blynk, physical delusion, perilous mission.

## I. INTRODUCTION

The camouflage robot locomotes using two gear motors and the motor driver moduleto supply sufficient current to drive the gear motors that will resist the damage of the Arduino mega. In order to minimize the power consumption we use less number of gear motors. The robot has infrared sensors that detects the obstacles leading on its way and turns to the opposite-direction. Beside sensor implemented in the robot is used to sense the living object in the environment which is intern captured by the visual sensor (cameras) it captures the image or videos and store it in the web server and notifies the user. The robot is designed with having in built wireless controller,Bluetooth controller and Pi-camera support. It continuously monitors the surrounding areas for the presence of unauthorized people.User unit communicates with spy robotic unit with the help of Internet which is through the Blynk application.

In the present circumstances where one of most treacherous tasks is to secure international boundaries under very harsh environments.The, robotic intelligence system performs the assigned objective with precision. Some systems are expensive to communicate and hence are not implemented. The current design of robotic system allows it to blend into various environments with its camouflage technology. With the assistance of IR sensor and PIR sensor the real time human body and objects detection for securing international boundaries.

## 1.1 NEED OF ROBOTS

The proposed system consists of surveillance system installed with a camera, which brings flexibility in monitoring borders. The locomotion and various-systems can be controlled in distant command center with mobile application as remote control for the robot which safeguards the human life. The communication is established with Blynk application.

## II. LITERATURE SURVEY

[1] Premkumar.M "UNMANNED MULTI-FUNCTIONAL ROBOT USING ZIGBEE NETWORK FOR DEFENSE APPLICATION".International Journal of Advanced Research in Computer Engineering & Technology (IJARCET)Volume 2, Issue 1, January 2016.

Robotic intelligence is capable to accomplish the given task with precision. Military personnel perform many daunting tasks by risking their life to protect international boundaries and people. Integrated including video screens for monitoring the enemy territory,sensors like various motion detectors,which help in locomotion of robot. The robotic system uses ZigBee for communication with the army personnel. This technology is designed to help to military personnel to perform assigned task with no human error.

[2] Akash Ravindran and Akshay Premkumar "CAMOFLAGE TECHNOLOGY"International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) ISSN: 0976-1353 Volume 8 Issue 1 –APRIL 2014.

Most of the military organisation nowadays take the help of the robots to carry out many risky and dangerous tasks that cannot be done with the help of soldier alone like with the use of camouflage technique. These robots which are used in

the various military applications are usually employed with an integrated system including the video screens, sensors cameras, various other equipment's to help them detect and find any dangerous or risky things.

[3] P. Hymavathi, T. Jyothy "Surveillance Alive Human Detection Robot using Zigbee Technology" (SSRG-IJECE) – volume issue 4 June 2014.

It provides significant support to mankind in arduous tasks that are infeasible for human beings to implement. The existing system consisted many complications like high cost setup to interact with the robot and control unit. The, propose system implants sensors for detecting alive humans in catastrophic environs, which rescues the operations. The intent is to implement the wireless multipurpose robot that can be directed through PC using Zigbee interface and help around the calamities to ensure the safety.

[4] Dr. S. Bhargavi, S. Manjunath, "Design of an Intelligent Combat Robot for war fields", The objective of this paper is to minimize human casualties in terrorist attack such as 26/11.

The combat robot has been designed to tackle such a cruel terror attacks. This robot is radio operated, self-powered, and has all the controls like a normal car. A wireless camera has been installed on it, so that it can monitor enemy remotely when required. Since human life is always precious, these robots are the replacement of fighters against terrorist in war areas.

[5] Jean Schultz, Jill L. Drury, Holly A. Yanco "Evaluation of Human-Robot Interaction Awareness in Search and Rescue" IEEE, 2004, PP. 2327-2332.

In this paper we report on the analysis of critical incidents during a robot urban search and rescue competition where critical incidents are defined as a situation where the robot could potentially cause damage to itself, the victim, or the environment. We look at the features present in the human-robot interface that contributed to success in different tasks needed in search and rescue and present guidelines for human-robot interaction.
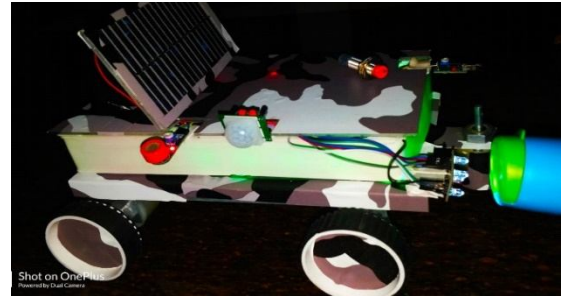
## III. HARDWARE AND SOTWARE DESIGN



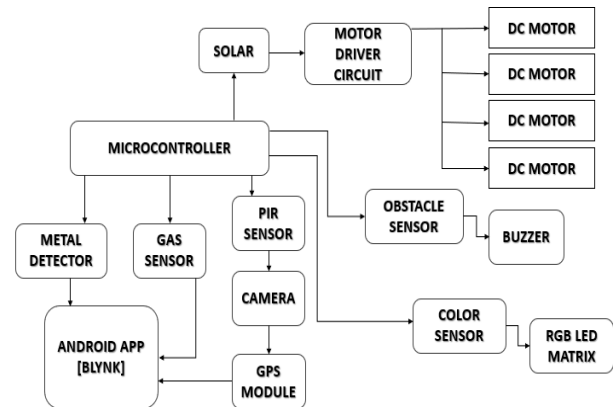Fig (a): Camouflage robot in green matrix



Fig (b): Architecture Diagram

Fig (a). Represents the change in matrix of robot into green color as detected and the hardware and softwaresoftware components as shown in fig b. The entire proposed system consists of microcontroller, metal detector, Gas sensor, PIR sensor, and IR sensor, RGB LED matrix, GPS, Blynk, camera, motor driver circuit and solar panel as shown in the fig (a). Passive Infrared sensor (PIR) is a pyroelectric device which detects the level of IR radiation from the living object. If living-body is detected less than 10 meters otherwise it resets the output(logic 1).Its worn in many systems because of inexpensive, low power.

Obstacle sensor, robot as automatic lighting application. As IR is light-sensitive infrared wavelength range of 850nm to 50mm where the maximum range is 10-15 cm. It's privilege as it consumes low power requirement.

Color sensor detects color in RGB scale categorized as red, green or blue equipped with filters of wavelength sensitivities at 580nm, 540nm, 450nm to of RGB colors respectively. Based on the filters, light to voltage converter is proportional to detect color.

Microcontroller is the brain for a robotic system. Arduino mega is one such microcontroller which controls the devices with its 54 digital input/output pins (of which 14 can

be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.

Blynk is a platform specifically build and designed for internet of things which controls the microcontroller over the internet. It gathers all the data from the sensors, displays and stores the data.

A motor driver acts as interface between the motor and controller circuit. The functionality of the motor driver is to take low current signal and turn it into a higher- current control signal that drives the motor.

A dc motor is a rotary electrical motor which converts direct current electrical energy into mechanical energy. Dc motor is essential for locomotion of the robot, a dc motor is driven with 6v to 12v of supply.

A metal detector is an electronic instrument that detects the presence of metal nearby. They often consist of a handheld unit with a sensor probe which can be swept over the ground or other objects.

A gas sensor is a device which detects the variation in the concentration of toxic gases. Based, on the concentration it produces a potential difference bychanging the resistance of the material inside the sensor which can be measured as output voltage.

A wireless camera is mounted on the robot body for spying purpose. This camera can rotate upto 180 degree to capture video and transmits it by the wireless transmitter to the receiving center as output of obstacle is detected.

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The GPS (Global Positioning Systems) Module plays a major role in the navigation of the robot.The need of GPS is to successfully navigate and perform tasks firstly it reads the current location if any threat.

## IV. IMPLEMENTATION

The contrivance of Blynk and hardware works as shown in the below use case diagram, how the user controls the robot which has the access to the sensors and detectors which conveys the message about the war field to detects if there is any uncertainty where it notifies the user on Blynk. The IDE

software ESP- 8266 Wi-Fi module is used to establish the Wi-Fi communication between the Arduino and the Blynk application to control and track the robot. The output of sensors is being reflected on the application.
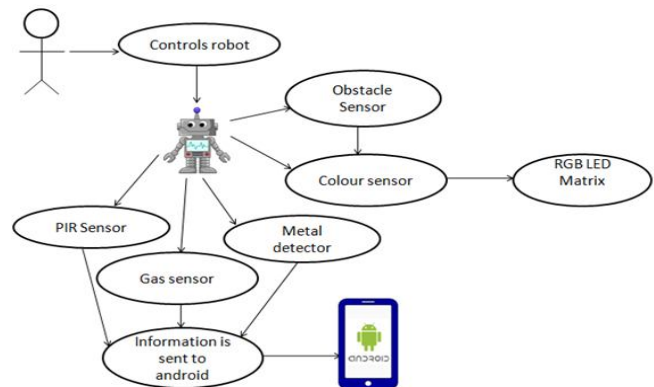
Fig (c): Use case diagram

## V. RESULT

The interconnected solar charges up the battery for functioning of the sensors and movement. The fig (d) describes the outcomes and research done on thisrobot. It camouflages into blue matrix when the colorsensor detects any object in the surrounding oftheir respective color as shown in the fig(d) below.
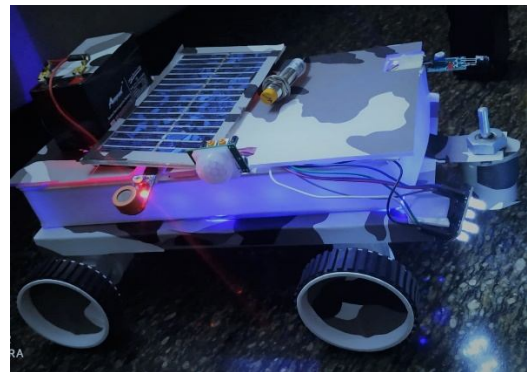
Fig (d). Camouflaged into blue matrix.
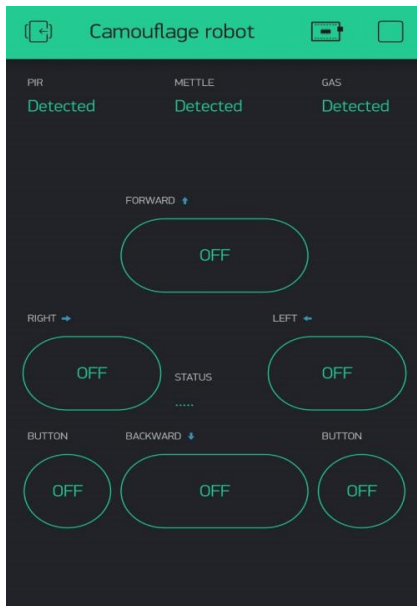
Fig (e): Camouflage Robotin red matrix

Fig (f): Blynk Application

It results the robotic system with respect to PIR sensor to detect human or surrounding and activates color sensor to set red as default state. On further movement of robot by using the 4 directions as shown in application, the metal detection and the toxic gas sensed is the outcome shown in fig(f). The buttons perform rotation of camera to capture image using in war field and notify to the headquarter. The robot camouflages into the surrounding color in-order to perform tasks of sensor. It beeps the buzzer as output if any obstacle is detected by IR sensor. The changing of color depends on surrounding environment using matrix being implemented.

## VI. CONCLUSION

The autonomous robot defined for intelligent security performs multitask concomitantly both in autonomous and manual mode in order to operate effectively in military terrain to detect opponents using affixed sensors that can result control unit with the succor of Blynk application as software implementation.

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[4] Guy Campion, Georges Bastin, and Brigitte D' AndrCa-Novel, "Structural Properties and   Classification Models of Wheeled Mobile Robots" , IEEE.

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