

THE AUTOMATION BASED VEHICLE FOR DETONATION, DETECTION & ALARMING

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Abstract:

Nowadays, many expenses are made in the field of defence in adopting primitive security measures to protect the border from the trespassers. Some military organizations take the assistance of mechanism within the risk prone areas that aren't that effective once done by army men. These Army robots square measure confining with the camera, sensors, metal detector and video screen. The main objective of our system is to get camouflaged including some additional parameters like blue-tooth module for real time data processed by the camera at the video screen and PIR sensor to trace the intruders. Thus, the proposed system using WIFI reduces errors at defence and keeps the nation secure from the foe. Camouflage Robot plays a vital role in saving human loses as well as the damages that occur during disasters. Thus, it'll gain a lot of importance within the future era. The robot basically consists of a vehicle mounted with two cameras, one camera which captures the images and detects

colour accordingly as part of camouflaging feature and the other camera is used for surveillance purposes. As a new trend we have used wireless transceiver WIFI to increase the range of communication between transmitter and receiver. The mechanism will quietly enter into enemy space and send info via camera to the controller. One of the salient features of this robot is camouflaging i.e. the camera captures the image and the colour of the surrounding will be detected at the backend and according to that robot will change its colour. Because of this feature the robot cannot be easily detected by enemies. The movement of the robot is wirelessly controlled via mobile. Since human life is always valuable, this robot can be the substitution of soldiers in war areas. It is inspired by creatures such as chameleon. The Camouflage robot can also be used in star hotels, shopping malls, jewellery showrooms, operation aids, and rescue crews during disasters, etc. Or at places such as where there can be threats from intruders or terrorists.

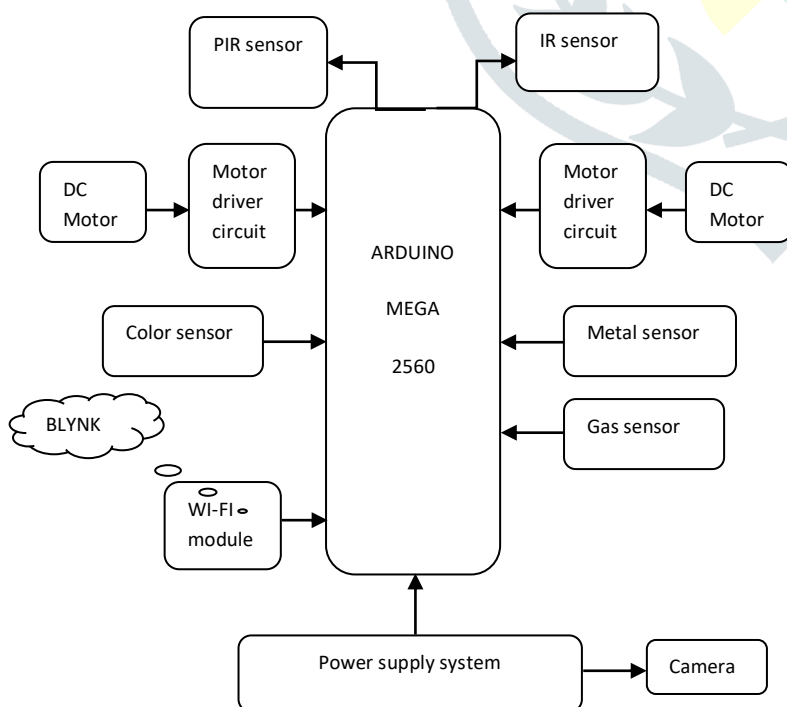
Introduction:

Basically, Army Robot is capable of performing tasks such as locomotion, sensing the harmful gas, sensing the humans beneath the surface, metal

detection. The main aim of the paper is to implement a Camouflaged technology based Wireless multifunctional Army Robot which can be controlled through smart phone using Wi-Fi.

These robots help to make human life much easier especially in dangerous areas & works. One of the priority areas of nowadays are the military. These robots act as the assistant of a soldier. Today, many military organizations take the help of military robots to perform risky jobs due to their accuracy of performing the jobs. These robots utilized in military are sometimes used with the integrated system. The main motive behind Camouflage Robot is to reduce human losses in military operations or terrorist attacks. Camouflage automaton acts as a virtual spy and may be sent into the strategic locations of military importance for observation and warfare purpose. The aim of the project is to design, manufacture and operate a robot via PC, used as remote-control device, a small mobile robot which can duplicate the colors where it moves on, hence being camouflaged to the outside world.

Block diagram:



Block Diagram of Automation Vehicle (Robot)

Hardware specifications:

Arduino: The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 (datasheet). It has fifty four digital input/output pins (of that fourteen is used as PWM outputs), sixteen analog inputs, four UARTs (hardware serial ports), a sixteen rate quartz oscillator, a USB affiliation, a power jack, an ICSP header, and a reset button. It contains everything required to support the microcontroller; merely connect it to a laptop with a USB cable or power it with a AC-to-DC adapter or battery to induce started. The Mega is compatible with most shields designed for the Arduino Duemilanove or Diecimila.

Power: The board will operate associate degree external offer of half dozen to twenty volts. If provided with but 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If exploitation quite 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

PIR device: The PIR device accustomed discover the movement of person among a particular vary of the device is named as PIR device or passive infrared sensor (approximately have a median price of 10m, but 5m to 12m is the actual detection range of the sensor). Fundamentally, pyroelectrical sensors that find the degree of actinic ray square measure accustomed create PIR sensors. There are different types of The PIR sensor circuit is used in numerous electronics projects which are used to discover a human being entering or leaving the particular area or room. These passive infrared sensors are flat control, consists of a wide range of lens, and PIR sensors

can be easily interfaced with electronic circuits sensor.

IR sensor: It consists of two parts, emitter circuit and a receiver circuit. This is collectively known as photo-coupler or an optocoupler. The electrode is associate degree IR crystal rectifier and also the detector is associate degree IR photodiode. The IR photodiode is sensitive to IR light emitted by an IR LED. The photodiode resistance and output voltage change in proportion to the IR light received.

Gas sensor: This is mainly implemented for the purpose of detection of harmful toxic gases at the surroundings and to alert the team for further process.

Metal sensor: It is also called as proximity sensor which detects the bombs, guns and weapons for security purpose. This is very much useful in the war fields to detect the bombs and weapons for acquiring and safeguarding purposes.

Color sensor: The TCS230 senses color light with the help of an 8 x 8 array of photodiodes. Then employing a Current-to-Frequency convertor the readings from the photodiodes born-again into a sq. wave with a frequency directly proportional to the sunshine intensity. Finally, victimization the Arduino Board we are able to browse the sq. wave output and obtain the results for the color. If we tend to take a better investigate the sensing element, we are able to see however it detects varied colors. The photodiodes have three different color filters. Sixteen of them have red filters, another sixteen have inexperienced filters, another sixteen have blue filters and therefore the different sixteen photodiodes area unit clear with no filters. Each sixteen photodiodes ar connected

in parallel, so using the two control pins S2 and S3 we can select which of them will be read.

DC Motor: Common DC gear head motors need current above 250mA. When the motor is directly connected to the o/p of the above ICs then, they might damage. To overcome this drawback, a motor control circuit is required, which can act as a bridge between the above motors and ICs. There ar varied ways in which of creating H-bridge control circuit like victimization semiconductor unit, relays and victimization L293D/L298.

Camera: It is mainly used for the real time data interpretation which is wireless and is done using RF trans-receiver. It is inbuilt with RF module trans-receiver.

Methodology:

The idea of the military automaton is predicated on the camouflage techniques. The aim of the project is to style, manufacture and operate via a wise phone, used as device device will reproduce the colour consequently with the bottom surface where it will be moving on, hence being camouflaged to the outside world. On the one hand, in order to achieve these goals, we used a LED (RGB) which can diffuse uniform colors, coupled to sensors that can precisely identify ground colors. This robot is designed in such a way that it can reproduce the color independently at various areas each area being able to reproduce color with specific spots of the ground surface which allow the robot to mock up as a checkerboard of multiple colors – the various colors it drives over. On the other hand, we also created a system which can receive and decipher information received from the Smart phone using

IOT to further pilot motors which in turn drive the robot in any required direction.

Camera is attached to show the real time data wireless through RF. Gas sensor to detect toxic gas, with the air all these values or updated in the website for every predefined time. Metal sensor to detect metal arm and weapons if any. PIR sensor to detect human intruders or soldiers beneath the earth. IR sensor is used for the obstacle detection and also.

Expected Outcome:

Though the existing urban search and rescue robots are equipped with various sensor but the problem with them is the cost. The sensor used in the development of this project is easily available and cost effective. Many lives can be saved by using this autonomous vehicle in war fields in a short duration which becomes time consuming and unaffected if done manually. This vehicle can be further developed by the usage of high range sensors and high capacity motors. Various sensors like mobile phone detector, metal detector etc. can be enforced to form this vehicle more practical. This robot is developed on small scale and is cost and energy efficient, its future is bright and wide. Robot can further be equipped with speaker or recorder to interact with survivor and assure them of nearby help.

Advantages:

1. This System is an effective and a safe system to ensure that there are no humans left behind in a rescue operation.
2. The System is safe even for the user because of the use of robotics and no manual work.

3. The system uses WIFI and this makes the system both accurate and reliable.

Applications:

1. In military application to detect the presence of human being.
2. In rescue operation where human reach is not possible.
3. In war fields, to control the unmanned aerial vehicle.
4. Tracking systems.

Conclusion:

The human detecting robot is highly favorable on circumstances where it's impossible for human beings to reach or monitor during unfortunate events. The implementation of this design is purely driven by usage of PIR sensors, IR sensors, Dc motors and cameras etc. Overall, this robot is a highly functional device that reduces the strain on humans during calamities.

Future Scope:

The proposed system provides a helping hand to our security forces in detection of intruders. The robot can also be used in high altitude areas where human cannot survive. Moreover, the camouflaging feature makes it tough to discover the golem by naked human eye. There is scope to improve the system by configuring it with multicolor camouflaging.

References:

Journal, Vol. 57, No. 6, November 2007, Pp. 797-810, 2007, Desidoc.

[1] Premkumar .M “UNMANNED MULTI-FUNCTIONAL ROBOT USING ZIGBEE ADOPTER NETWORK FOR DEFENSE APPLICATION” International Journal of Advanced Research in Computer Engineering & Technology (IJARCET)Volume 2, Issue 1, January 2013.

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

[3] P. Hymavathi, T. Jyothy “Surveillance Alive Human Detection Robot using Zigbee Technology” SSRG International Journal of Electronics and Communication Engineering (SSRG-IJECE) – volume issue 4 June 2014.

[4] George Bekey,” Autonomous Robots: From Biological Inspiration to Implementation and Control”, MIT Press, Cambridge, MA, 2005. Mr. M. Arun Kumar, Mrs. M. Sharmila” Wireless Multi Axis ROBOT for Multi-Purpose Operations”, Department of ECE, SVCET & JNT University Anantapur, India.

[5] Dr. S. Bhargavi, S. Manjunath, “Design of an Intelligent Combat Robot for war fields”, Department of Electronics and Communication Engineering, S.J.C.I.T, Chikballapur, Karnataka, India

[6] Landmine Detection Technologies to Trace Explosive Vapour Detection Technique, C. Kapoor1 and G.K. Kannan, Defense Science