ARMY ROVER (UGV)

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Abstract

In today's world, the Camouflage Robot is part of a vital role in rescuing missing people and infiltrating into enemy territories. The robot also substitutes soldiers in warzones. These are often designed to work in a hazardous climate. One of the best features about this robot, to summarize it, camouflaging i.e. The sensor detects the surrounding and projects on the body of the system so that the robot remains unobserved. Due to this feature, the robot cannot be easily captured or seen by the enemy. Some military-like organizations make use of robots in a safe and secure environment compared to the military. The main aim of this method is to encourage the object to conceal its presence in the world. The main objective of this paper is to use the wireless multi-purpose Army Robot predicated on.

Introduction

ROVER is an abbreviation for Remotely operated Video Enhanced Receiver. For our Project we are making a Rover prototype which is mainly useful for Surgical Strikes in Armed Forces. Being small in size it can reach areas which a human can’t go. Robotics has been a staple of advanced manufacturing for over half a century. As robots and their peripheral equipment become more sophisticated, reliable and miniaturized, these systems are increasingly being utilized for entertainment, military, and surveillance purposes. A remote-controlled surveillance robot is defined as robot that is remotely controlled to capture images/video for specific purposes. Mobile robots that are controlled remotely have important rules in area of rescue and military. A rescue robot is a kind of surveillance robot that has been designed for the purpose of rescuing people. Common situations that employ rescue robots are mining accidents, urban disasters, hostage situations and explosions. Military robots are autonomous robots or remote-controlled devices designed for military applications. Such systems are currently being researched by a number of militaries.

Working

The system has transmitter side and receiver side. The transmitter side have control over robot and screen for live system status and video which is recorded by wireless camera fitted on robot. The data transmitted wireless using RF link. On receiver side control & the camera and motor using motor driver, whereas gas sensor and metal sensor takes continuous reading and forward it to user side through RF link. And the sensors proportional value to the microcontroller.

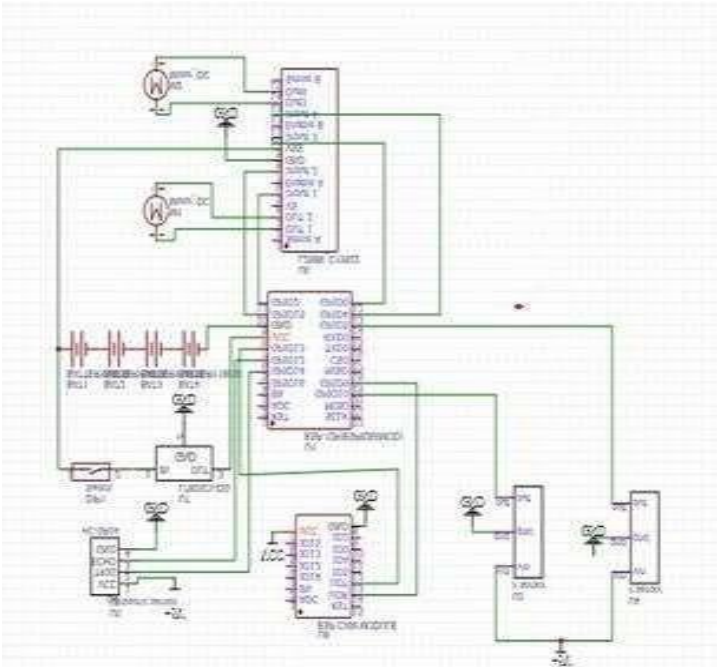

Fig.1 Circuit Diagram

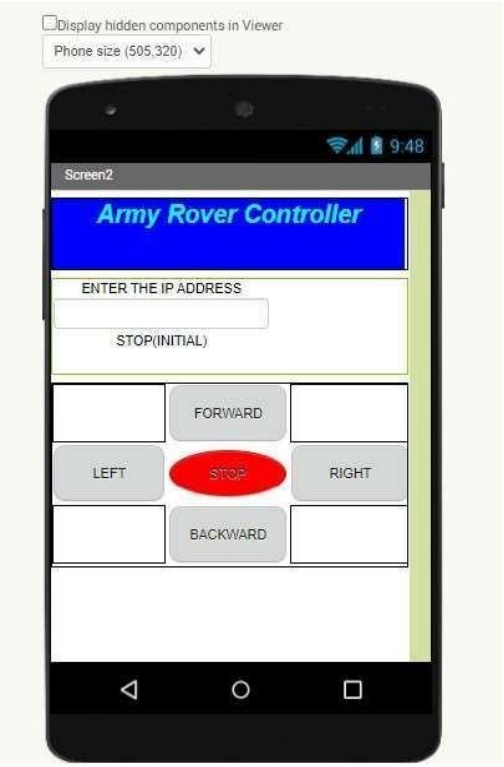

Fig.2 Mobile Application

Component used

WIFI Module

The ESP8266 module enables microcontrollers to connect to 2.4 GHz Wi-Fi, using IEEE 802.11 bgn. It can be used with ESP-AT firmware to provide Wi-Fi connectivity toexternal host MCUs, or it can be used as a self-sufficient MCU by running an RTOS- based SDK.

Ultrasound sensor

The ultrasonic sensor works on the principle of SONAR and RADAR system which isused to determine the distance to an object. An ultrasonic sensor generates high- frequency sound (ultrasound) waves. When this ultrasound hits the object, it reflectsas echo which is sensed by the receiver as shown in below figure.

Arduino IDE-

The ATmega328 is one kind of single-chip microcontroller formed with Atmel within the mega AVR family. The architecture of this Arduino Uno is a customized Harvard architecture with 8 bits RISC processor core. Other boards of Arduino Uno include Arduino Pro Mini, Arduino Nano, Arduino Due, Arduino Mega, and Arduino Leonardo

DC Motor

An electrical motor is an electrical machine that converts electricity into energy. Usedin the robot to move forwards and backwards.

Gas Sensor

The MQ-2 Combustible Gas and Smoke Sensor. It can be used for both Detecting thegas and also for detect gas or smoke, but can also detect LPG, Alcohol, Propane, Hydrogen, Methane, and Carbon Monoxide

Camera Module

The ESP32 CAM Wi-Fi Module Bluetooth with OV2640 Camera Module 2MP For FaceRecognition has a very competitive small-size camera module that can operate independently.

It is suitable for home smart devices, industrial wireless control, wireless monitoring, and other IoT applications.

Software's/Hardware Used

- MIT App Inventor- To make an application which can control the rover.
- Proteus Simulation Software
- Arduino IDE- To upload the code written for the Army rover prototype
- Arduino uno
- ESP8266 WIFI Module
- Gas Sensors
- ESP32 Camera Module

Literature Review

For Literature review we have studied the below papers.

IEEE Conference Paper: Arduino controlled war field spying robot using night vision wireless camera and Android application.

International Journal of Engineering & Technology: War Field Spying Robot (Research paper).
IJCT (Research Article): War Field Spying Robot Dissertation.
Forecasting Change in Military Technology 2020-2040 by Michael O Hanlon.

Conclusion

Every day our army soldiers will walk into the death, they will keep their life at risk to save our lives. Reduce the Risk of patrolling areas. From this project we conclude that our project provides a better vehicle security that provides easy access to user as well as more security features. Besides this our aim is to military based circuitry and relatively simple cheap, and low-cost integrated home security system.

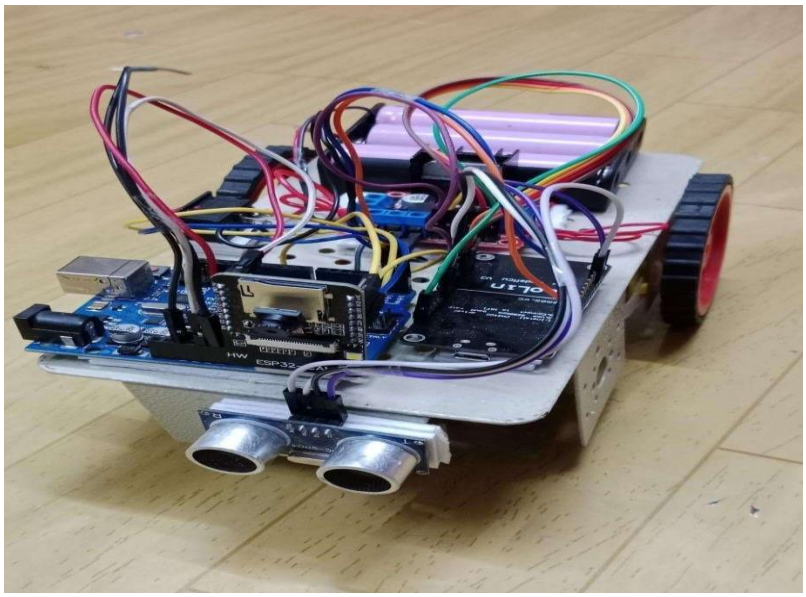

Fig.3 Final model of rover

Acknowledgement

The paper is based on the creating the robot that can assist soldiers during time of crisis. We analyzed and did the modification required in the existing system. This helps the ARMY by assuring to reach the position s that are difficult for the soldiers to reach. Thus, ensuring their safety. We all the authors are very much thankful for the continuous support and inspiration received from our guide.

References

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