SURVEILLANCE ROBOT USING NIGHT VISION AND METAL DETECTOR

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Abstract

The main objective for developing the robot is for the surveillance of human activities in the war field or rescue operations in order to reduce attacks from the enemy side. The robot consists of night vision wireless camera which can transmit live videos of the war field in order to prevent any damage and loss to human life. Military men have a huge risk on their lives while entering an unknown territory. The robot will serve as an appropriate machine for the defence sector to reduce the loss of human life and will also prevent illegal activities. It will help all the military people and armed forces to know the condition of the territory before entering it. This can also be used in various rescue operations to save the man power and to monitor hazardous situations. The main advantage of this project is that we can easily control the robot using an android mobile by a blynk app. An ESP 32MICROCONTROLLER is used for the desired operation. A smart cell phone with IP web cam application is mounted on the robot body for spying purpose even in complete darkness by using infrared lighting. This will send the videos wirelessly at the transmitter side (laptop).

Keywords: Robot, War Spying robot, Android app (Smart Cell Phone)

LITERATUREREVIEW

1. Amit Kumar Shingankar **,** Author :- Arduino controlled war field spy robot using night vision wireless camera and android application. The main objective behind the robot is for surveillance of human activity in the war field or border regions in order to reduce infiltration from the enemy side The robot sends the signal to the RF receiver mounted on the robot via RF transmitter at the base station.
2. Neha Roy, Suraj Chavan, **,** Author :- Military spying and metal mines detection wire less robot with night vision camera. The project is designed to develop a robotic vehicle using RF technology for remote operation attached with wireless camera for monitoring purpose. The robot along with camera can wirelessly transmit real time video with night vision capabilities. This is kind of robot can be helpful for spying purpose in war fields.
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Objective

The main objective behind developing this robot is for the surveillance of human activities in the war field or border regions. The robot consists of night vision wireless camera &IOT Technology.

Basic Concept of Design:

Saving human life and providing security to the same both are two different aspects but both of them are essential and instead mandatory. This innovative system is made for operations which involve high risk for humans to enter, especially for some criminal case and may prove very beneficial for military area for spying purposes. This spy robot can be used in the areas where there can be threat from intruders or terrorists. At the time of war where it can be used to collect information from the enemy terrain and monitor at a far secure area and safely devise a plan for the counter attack , Tracking location of terrorist organization and the plan attack at suitable time making a surveillance of any affected area where human being cannot go. This is kind of robot can be helpful for spying purpose in war fields and in order to minimize the attacks like 26/11 in Mumbai in future. It can also be helpful where living being cannot reach.

Research Methodology

- Study of hardware materials & Software used in project.
- Implementation of hardware models. .
- Implementation of software coding.
- Installing various hardware components.

SYSTEM REQUIREMENTS AND SPECIFICATIONS

1 Hardware requirements

- ESP 32 microcontroller
- DC motor
- Motor Driver (L293D)
- Battery Chassis
- Wheels
- Metal detector
- Night vision camera
- Bread board and connecting wires

2 Software requirements

- BLYNK – Smartphone Google play Application for IOT
- Arduino IDE

1.1 ESP 32 microcontroller

ESP32 is capable of functioning reliably in industrial environments, with an operating temperature ranging from –40°C to +125°C. ESP32 is highly-integrated with in-built antenna switches, RF balun, power amplifier, low-noise receive amplifier, filters, and power management modules. Engineered for mobile devices, wearable electronics and IoT applications, ESP32 achieves ultra-low power consumption with a combination of several types of proprietary software.ESP32 can perform as a complete standalone system or as a slave device to a host MCU, reducing communication stack overhead on the main application processor. ESP32 can interface with other

systems to provide Wi-Fi and Bluetooth functionality through its SPI / SDIO or I2C / UART interfaces.

1.2 DC motor

A DC motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current in part of the motor.

1.3 Motor driver

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC.Dual H-bridge Motor Driver integrated circuit (IC).The l293d can drive small and quiet big motors as well

1.4 Battery

A lithium-ion battery or Li-ion battery (abbreviated as LIB) is a type of rechargeable battery in which lithium ions move from the negative electrode to the positive electrode during discharge and back when charging. Liion batteries use an intercalated lithium compound as one electrode material, compared to the metallic lithium used in a non rechargeable lithium battery.

The electrolyte, which allows for ionic movement, and the two electrodes are the constituent components of a lithium-ion battery cell.

1.5 Metal detector

Metal detectors can detect nearly all metallic objects. That means anything that contains elements like gold, silver, iron, nickel, copper, aluminum, tin and lead or mixtures and combinations like bronze and brass. Metal detectors cannot detect non-metal items such as wood, plastic, stones and bone. Some metal detectors are able to discriminate which means that they can differentiate between various types of metal.

1.6 Night vision camera

IR or night vision cameras use infrared light to illuminate images in the dark. We can't see it, but infrared light is actually all around us. IR cameras detect these invisible infrared wavelengths, enabling the camera to see in the dark.

2.1 Blynk app

Blynk is designed for the Internet of Things. It can control hardware remotely, it can display sensor data, it can store data, visualize it and do many other cool things There are three major components in the platform: Blynk App - allows to you create amazing interfaces for your projects using various widgets we provide.

Blynk Server - responsible for all the communications between the Smartphone and hardware. You can use our Blynk Cloud or run your private Blynk server locally. Its opensource could easily handle thousands of devices and can even be launched on a Raspberry Pi.

Blynk Libraries - for all the popular hardware platforms - enable communication with the server and process all the incoming and out coming commands. Easy to integrate and add new functionality using virtual pins

2.2 Arduino IDE

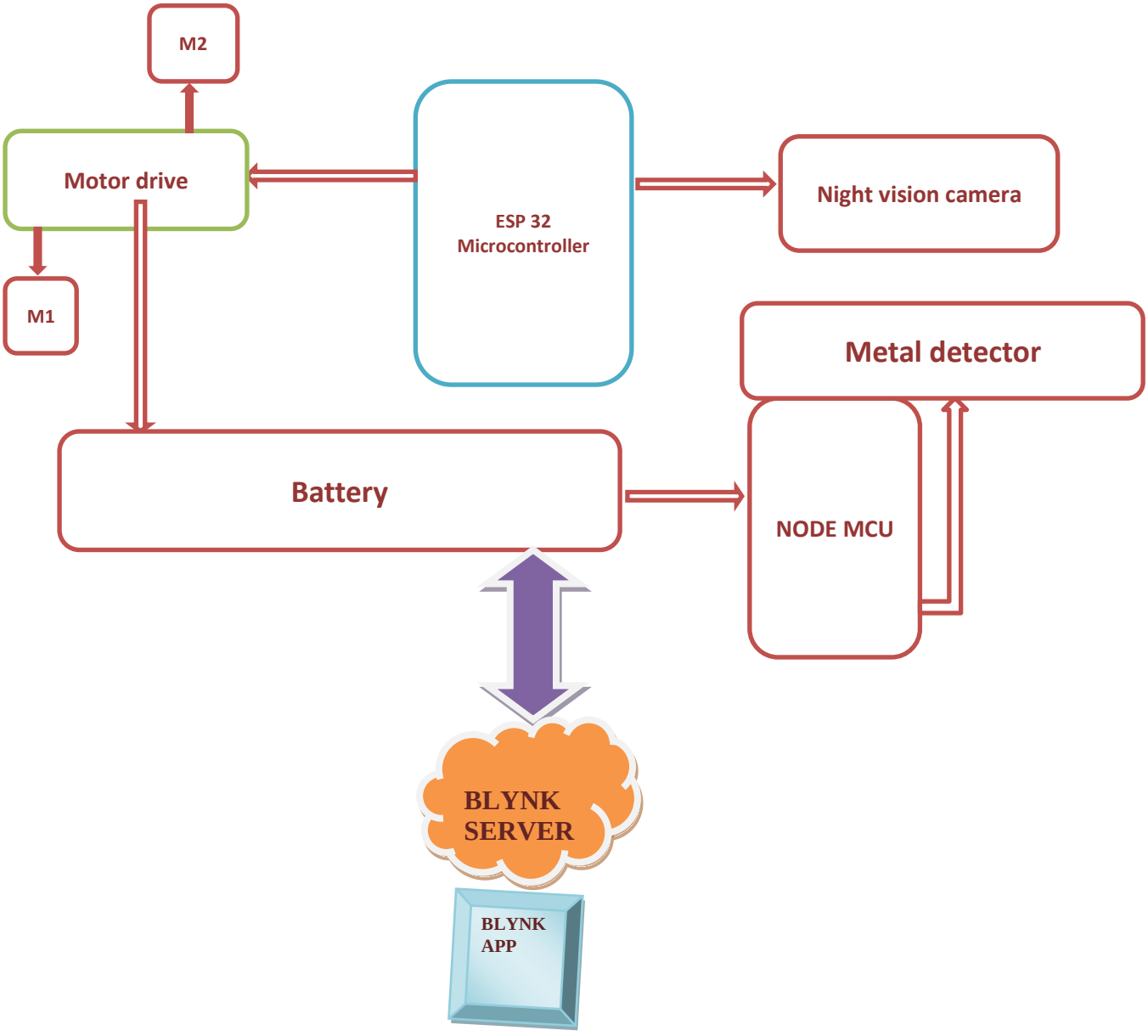
The Arduino IDE is an open-source software, which is used to write and upload code to the Arduino boards. The IDE application is suitable for different operating systems such as Windows, Mac OS X, and Linux. It supports the programming languages C and C++. Here, IDE stands for Integrated Development Environment. The program or code written in the Arduino IDE is often

called as sketching. We need to connect the Genuine and Arduino board with the IDE to upload the sketch written in the Arduino IDE software. The sketch is saved with the extension '.ion.'

Procedure:

- The robot has microcontroller ESP 32 which has inbuild wifi system.
- When we turn on the network the microcontroller automatically connected with the receiver section and start working.
- The receiver section has 5 buttons v0,v1,v2,v3 and v4 i.e. forward ,backward ,left, right and stop respectively .The robot start working according to the key pressed .
- The night vision camera is connected with the microcontroller ESP 32 and sends live video to the local host.
- Metal detector is connected with the microcontroller NODE MCU ESP 8266, buzzer and battery. When the metal detector contacts with the metal the buzzer gives the signal.

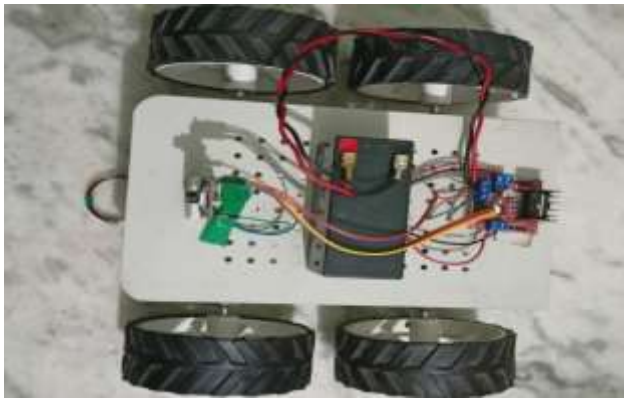
Block Diagram:-



Results and Discussion

After configuring all the parts, assembling as required and configuring Software finally we obtained SURVILLENCE ROBOT which is shown below it has performed the task of detecting metal and give the signal as well as the night vision camera gives the live video to the local host . The metal detector senses the metal with the range between 15cm , we can also increases the range.

(Front view)



(Upper view)

Conclusion

The primary need for our paper would be accuracy. We have been able to view the things accurately that are currently happening in the surrounding area. Our design has not caused any sort of disturbances..

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