
War Field Robot with Night Vision Camera

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Abstract

Surveillance is that the process of monitoring a situation, a locality or someone. This generally occurs in a very military scenario where surveillance of borderlines and enemy territory is crucial to a country's safety. Human surveillance is achieved by deploying personnel near sensitive areas so as to constantly monitor for changes. But humans do have their limitations, and deployment in inaccessible places isn't always possible. Thus, in recent times, surveillance technology has become a region of greater search interest. However, building a little robot for testing and research purposes proves to be extremely expensive. Primarily because a security robot would require certain components like a GPS module (Global Positioning System), High resolution cameras, radios for satellite connectivity, etc. Each of those components is quite expensive and piecing them together for the aim of a robot may be a very costly and time consuming affair.

We propose a cheap four wheeled surveillance robot using an Arduino UNO microcontroller and a sensible phone running the Android package. Surveillance robots typically carries with it a video camera, Audio input output, 360 degree view, accesses from anywhere. Android smart phones include excellent hardware satisfying the above needs. This may be leveraged and wont to advantage through APIs (Application Programming Interfaces) provided for the Android software system. Moreover, the value for building said robot employing a smart phone is mitigated to an excellent extent. The

robot are often controlled remotely from a PC using the web and a microcontroller smart phone interface residing on the robot.

To capture and archive the important time video from the robot, the inbuilt camera input of the phone is used. The robot is often controlled supported visual feedback from the identical smart phone. Four motors help achieve a zero turning radius. The camera is attached to a stepper motor which makes it feasible to capture the scene or object of interest. The captured video are often enhanced and made intelligible using further image processing on the remote PC thereby eliminating the requirement for extra DSP hardware on the robot. Thus, it's our aim to make a fully-featured surveillance robot using an easily available Android phone, which might be remotely controlled over the web.

Keywords: *Arduino UNO, Android phone, Mobile application, Bluetooth, Wi-Fi*

INTRODUCTION

Surveillance is that the process of monitoring a situation, a neighborhood or an individual. This generally occurs during a military scenario where surveillance of borderlines and enemy territory is crucial to a country's safety.

Human surveillance is achieved by deploying personnel near sensitive areas so as to constantly monitor for changes. But humans do have their limitations, and deployment in accessible places isn't always possible. There also are added risks of losing personnel within the event of getting caught by the enemy. With advances in technology over the years,

however, it is possibly to remotely monitor areas of importance by using robots in situ of humans. Except the apparent advantage of not having to risk any personnel, terrestrial and aerial robots can even pick up details that aren't obvious to humans. By equipping them with high resolution cameras and various sensors, it's possible to get information about the particular area remotely.

Satellite communication makes it possible to speak seamlessly with the robots and acquire real-time audio visual feedback. Thus, in recent times, surveillance technology has become a neighborhood of greater search interest.

However, building a tiny low robot for testing and research purposes proves to be extremely expensive. Primarily because a security robot would require certain components like a GPS module (Global Positioning System), High resolution cameras, radios for satellite connectivity, etc. Each of those components are quite expensive and piecing them together for the purpose of a robot may be a very costly and time consuming affair. Moreover, lots of your time is wasted in writing driver code to interface of these components. The answer to the current dilemma is kind of simple.

In the previous couple of years, feature-rich smart phones became popular. These phones come equipped with the desired features like a GPS module, a high resolution camera and internet connectivity. Thanks to the extremely efficient supply chains that get in manufacturing consumer electronic devices, these phones come quite cheap for the features that they supply. Also, the Operating systems on these smart phones provide Application Programmer Interfaces (APIs) for using the varied sensors with ease. By using the APIs provided, we will easily write apps in a very high-level language like Java, without the complication of writing driver code. In

our system, we've got used a wise phone running the Android software system which is one the foremost popular mobile operating systems today. Thus, it's our aim to create a fully-featured surveillance robot using an easily available Android phone, which may be remotely controlled over the net.

METHODOLOGY

In the proposed system contain several parameters like PIR sensor, sensing element give the sense to the ARDUINO microcontroller. The PIR (Passive Infra-Red) Sensor could be a pyroelectric device that detects motion by measuring changes within the infrared levels emitted by surrounding objects.

Metal detector using high-frequency oscillation to detect ferrous and non-ferrous metal objects and in capacitive models to detect non-metal objects. Geared dc motor scan be defined as an extension of dc motors. A geared DC Motor.

The spy robot can easily move, capture images and wirelessly transmit them, thus giving the soldiers intimation about the hazards and situations within the war field. The robot will move looking on the motor

direction based upon the input we give through transmitter (remote) section.

The robot is employed for brief distance surveillance thus ensuring this Security of the region. This helps the forces to look at the items accurately that are currently happening within the surrounding area and to plan ahead accordingly.

Thus we should always be ready to manipulate its path when necessary, to make the robot safely. To any or all that, a bearing unit is required, where control units RF signal is employed. By using these signals encoding is completed & signal is distributed through the transmitter. At the receiver end these decoded signal are given as input to drive the motor. Not for long range applications it may be used as a spy robot within short distances.

Arduino UNO

The Arduino Uno R3 could be a microcontroller board supported the ATmega328. it's 14 digital input/output pins (of which 6 may be used as PWM outputs), 6 analog inputs, a 16 MHz oscillator, a USB connection, an influence jack, an ICSP header, and are set button. It contains everything needed to support the microcontroller; simply connect it to a

computer with a USB cable or power it with a AC-to-DC adapter or battery to induce started.

Uno differs from all preceding boards in this it doesn't use the FTDI USB- to-serial driver chip. Instead, it features the at mega 16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. Revision 2 of the Uno board (A000046) contains a resistor pulling the 8U2 HWB line to ground, making it easier to place into DFU mode.

Passive Infrared Sensor (PIR)

The time period PIR is the quick shape of the Passive Infra Red. The time period “passive” suggests that the sensor does now no longer actively participate with inside the process, which means, it does now no longer emit the referred IR alerts itself, as an alternative passively detects the infrared radiations coming from the human frame in the encircling area.

The detected radiations are transformed into an electrical price, that's proportional to the detected stage of the radiation. Then this price is similarly stepped forward via way of means of a constructed in FET and fed to the output pin of the tool which will become relevant to an outside circuit for

similarly triggering and amplification of the alarm stages.

Metal detector

Metal detector the usage of high-frequency oscillation to hit upon ferrous and non-ferrous steel gadgets and in capacitive fashions to hit upon non steel gadgets. Models are to be had with surroundings resistance, warmth resistance, resistance to chemicals, and resistance to water Proximity Sensors convert records at the motion or presence of an item into an electrical signal.

DC Motor

1500RPM Centre Shaft Economy Series DC Motor is top quality low cost DC geared motor. Its steel gears and pinions to make sure longer life and better wear and tear properties. The gears are fixed on hardened steel spindles polished to a mirror finish.

The output shaft rotates in a very plastic bushing. The full assembly is roofed with a plastic ring. Gearbox is sealed and lubricated with lithium grease and need no maintenance. The motor is screwed to the gear box from inside .Although motor gives 150 RPM at 12Vbut motor runs

smoothly from 4V to 12V and offers big selection of RPM, and torque.

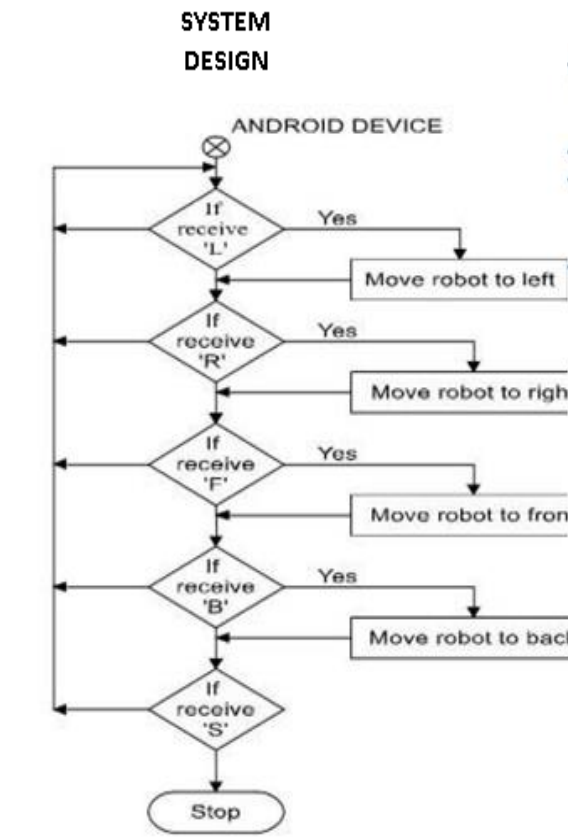
Tables below gives fairly good idea of the motor's performance in terms of RPM and no load current as a function of voltage and stall torque, stall current as a function of voltage. For compatible wheels check with wheels and accessories product category. You can also mount this motor on the chassis using Motor Mount for Centre Shaft Economy Series DC Motor for adding Position Encoder, seek advice from Encoder Kit for Centre Shaft Economy Series DC Motor.

Problem Formulation

Design and implement war field spying robot with wireless night vision camera A Objectives

1. To design a robot.
2. To capture the videos at the night using night vision camera.
3. Monitoring using RFID.
4. To monitor the night activities at the war field.

SYSTEM DESIGN



System Design

Step 1:- Move the robot on the front.

Step 2:- Move the robot on the back.

Step 3:-Move the robot on the right.

Step 4:-Move the robot on the left.

The above block diagram contain the aurdino uno, LED,Metal Detector ,Wi-Fi module and power supply wireless camera will detect enemy side wrong things in 100 meter area. This input will shown by LED. The aurdino uno is a microcontroller board based on the datasheet. the wi-fi module is used for sending input information to the system.

When the particular application directions will turn left, right, front or back the robot using the Android Application. Using the metal detector and light sensor robot will science the metal light and other unnecessary things.

Due to our system is IOT based the owner can monitor the work of robot help with android application.

Advantages

- Wireless control.
- Surveillance system.

- Vehicle navigation with use of IOT technology.
- Takes in use of the mobile technology which is almost available everywhere.

Limitation

- Limited distance of operation.
- Video in Streaming not recording.
- Battery backup is limited.

Future Work

A wireless camera is mounted on the robot vehicle for spying and surveillance purpose even in getting dark by using infrared lighting. Future modifications may be made to perform different tasks with precise control such as: A Robot Mounted with camera. A headset, with a full-color display. A mission control center.

CONCLUSION

A robot is described that uses night vision wireless camera which is operated by an android application. This robot may be further modified using gas sensors as well as bomb diffuse kit. This model of a robot

has various applications that include military missions, wireless security and surveillance and search and rescue operation.

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