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ARDUINO BASED RF CONTROLLED SPY ROBOT WITH NIGHT VISION CAMERA

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Abstract- In today's era of advanced technology and surveillance needs, the development of a remotely operated spy robot equipped with a night vision camera has become increasingly relevant. This abstract provides a concise overview of a project aimed at designing and building an RF (Radio Frequency) controlled spy robot integrated with a night vision camera system. The multipurpose robotic system known as the RF Controlled Spy Robot with Night Vision Camera was developed with the intention of secretly exploring and navigating remote or hazardous environments. A variety of features are included in the robot to guarantee effective operation and surveillance capabilities. This system uses RF remote controlled vehicle which has a camera that will be needed for spying purposes. The system proves to be very beneficial in places where humans cannot be sent for spying purposes such as military places as there can be some risk involved. This system's vehicle comes equipped with a night vision camera. Using an RF remote, this vehicle can be operated wirelessly. Here the camera send signals to the receiver used and the place that will be captured by the camera can be displayed remotely on a PC and can be recorded for further reference. The RF remote has 4 push buttons for forward, backward, left and right which will make the vehicle move in the direction specified.

I.INTRODUCTION

The armies that have made investments in cutting-edge technologies and the creation of robotic systems have a significant advantage over other armies that have not developed as much, which may make them stronger in battle. Even without deep analysis we are able to predict that modern conflicts will be to a large extent carried by devices with a high degree of autonomy, thus with the greatest possible independence on human. Since robotic automation is a natural progression of modern human civilization, the topic's importance cannot be disputed. If armies want to be competitive (facing new global threats) they will have to invest heavily in the development of modern technologies and especially into robotic system.[1] In the upcoming military operations, the robot and the remote control station play a very important role. Nowadays the technologies are improved so creating a multipurpose operation robot for military surveillance will be an asset. Currently, the Indian Army has Daksh Military robot to combat in battle field. As technology spreads rapidly in the automation field, military robots are being used as soldiers in war zones to reduce casualties and complaints. 2] The main technology used here for serial communication is Bluetooth technology. Regardless of how far apart two devices are, this technology can be used to share data between them. The Bluetooth module HC-05 will be connected with the robot and the commands to the robot will be given through the Android application. The war filed robot consists of Arduino Uno board as a controller board. It has L293D motor driver ICs along with the HC-05 Bluetooth module. Two DC motor are also used for the motion of the robot. In order to keep an eye on the situation, the robot has a wireless night vision camera that can be rotated 360 degrees using an Android application and a motor. 3]

II.LITERATURE SURVEY:

In[1] War spying robot with wireless Night Vision Camera was designed. :The main aim and objective of this project is to deal with the security issues such as combating of the terrorists activities by tracking their locations and launch pads and reducing soldier's efforts and involvement in the mission. This can be achieved by the RF BASED spy robot which consists of a night vision wireless camera. The robot has a wireless night vision camera that can record real-time videos and footages even in the dark. These videos and footages are shown on our mobile screen, which is connected to the robot via Wi-Fi through MI-app spy.

In [2], an Android application and a wireless night vision night vision camera are used to control a war field spy robot. The main objective behind developing this robot is for the surveillance of human activities in the war field or border regions in order to reduce infiltrations from the enemy side.The robot consists of night vision wireless camera which can transmit videos of the war field in order to prevent any damage and loss to human life. When they enter uncharted territory, members of the military face a significant threat to their own lives.

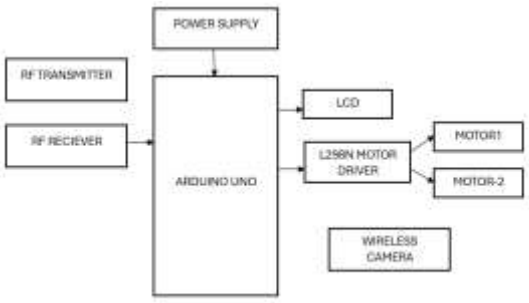
In [3] RF Based Night Vision Spy Robot Using PIC Controller, the night vision spy robot is used for information collection; the term "spying" refers to gathering secret information against any terror organization or observing an adversary's movements. In this robotic vehicle, two pic microcontrollers are used namely pic 16f877a, one is used at receiver circuit and another is at the transmitter. By using transmitter , commands are transmitted to the robotic vehicle ,according to that commands the robotic vehicle will move forward ,backward ,left and right . There are four dc motors are used for the movement of vehicle. The RF based night vision camera which is mounted on the robotic vehicle, will captures an images and send these images to the IR receiver which is connected to the T.V. or laptop and we can see these images on the laptop or T.V. We can keep watch remotely by using these camera we can see at night also. so it is very useful for surveillance purpose.

In[4] Solar Powered Fire Extirpation Robot with Night Vision Camera In this paper we have constructed a fire extirpation robot with night vision camera which is solar power driven. The agent is mounted with 4 sensors and 2 motors and has a capability of detecting the fire prone areas with the help of the smoke and temperature sensors. It surpasses any obstacles using ultrasonic sensor and also identifies any live body in the affected area using PIR sensor. It creates a buzzer alert and sprays water or co2 by pumping it from the tank or cylinder mounted on the chassis of the robot. Night vision camera can monitor all the activities of the robot even in dark.

III.PROPOSED SYSTEM:

This system uses RF remote controlled vehicle which has a camera that will be needed for spying purposes. The system proves to be very beneficial in places where humans cannot be sent for spying purposes such as military places as there can be some risk involved. The vehicle in this system has a night vision enabled camera. This vehicle can be operated wirelessly using RF remote. Here the camera send signals to the receiver used and the place that will be captured by the camera can be displayed remotely on a PC and can be recorded for further reference. The RF remote has 4 push buttons for forward, backward, left and right which will make the vehicle move in the direction specified.

BLOCK DIAGRAM:



IV.MODULE DECRIPTION:

A.Arduino Uno Microcontroller :

Based on the 8-bit ATmega328P microcontroller, the Arduino Uno is a microcontroller board. Along with ATmega328P, it consists other components such as crystal oscillator, serial communication, voltage regulator, etc. to support the microcontroller. The Arduino Uno has a reset button, six analog input pins, a USB connection, a Power barrel jack, an ICSP header, and 14 digital input/output pins, six of which can be used as PWM outputs. Arduino can be used to communicate with a computer, another Arduino board or other microcontrollers. The ATmega328P microcontroller provides UART TTL (5V) serial communication which can be done using digital pin 0 (Rx) and digital pin 1 (Tx). An ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. There is no need for an external driver because the ATmega16U2 firmware makes use of standard USB COM drivers. However, on Windows, a .inf file is required. The serial monitor included in the Arduino software makes it possible to transfer straightforward textual data to and from the Arduino board.

Fig 1:Arduino UNO controller

B.RF Wireless Transmitter and Receiver Module for Arduino

The transmitter module and the receiver module are the two main parts of the 433 MHz RF Wireless Transmitter and Module Set. The transmitter module is designed to send data wirelessly using radio frequency signals at 433MHz, while the receiver module is designed to receive these signals and convert them back into usable data for the Arduino or other microcontrollers. These modules are compact and lightweight, making them easy to integrate into various projects. The transmitter module typically operates with a voltage range of 3V to 12V, while the receiver module usually operates at a standard 5V. Through straightforward data pins, both modules are made to interface with microcontrollers, making communication setup simple.

Fig 2:RF Modules

V.RESULTS:

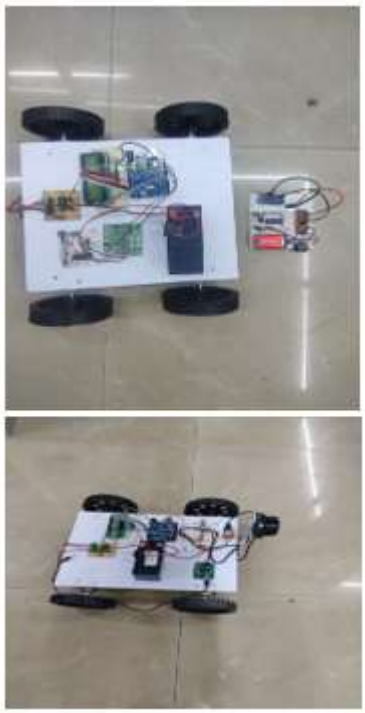


Fig 3:Hardware implementation

VI.CONCLUSION

The system proves to be very beneficial in places where humans cannot be sent for spying purposes such as military places as there can be some risk involve. This robot has night vision camera which can easily detect the vision and can captured it. The spy robot transmit them can easily move, capture images and wirelessly, thus giving the soldiers an intimation about the dangers and situations in the war field also. The

main aim of the project is to implement a wireless robot which can be controlled through remote control using RF module and navigates around the areas and tries to capture surrounded area.

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