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Spy Robot

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Abstract: ***The major reason for creating this robot is so that it can monitor combatants' movements and maybe take the position of guards who patrol at night. The Robots are equipped with night vision wireless cameras that may send videos of the battlefield to minimise damage and human casualties. Military personnel that enter an uncharted area run a serious risk to their lives. The robot will function as an effective piece of military equipment to reduce the loss of human life and to halt criminal activity. It will make it possible for all military personnel and members of the armed forces to comprehend the situation.***
Keywords: Arduino, Night Vision, Bluetooth Module

I. INTRODUCTION

Surveillance is the process of keeping an eye on someone, a location, or a circumstance. This often takes place in a military environment because monitoring enemy territory and border lines is essential for a nation's security. By placing people close to important locations, it is possible to conduct human surveillance while continuously monitoring for changes. Deployment in hostile environments isn't always possible, but, as people do have limitations. The possibility of losing personnel if the adversary finds you poses additional hazards. Though it may now be possible to remotely monitor important areas using robots rather than people due to technological advancements over the years. Aerial and ground robots provide the obvious benefit of not putting any personnel at risk.

Technology has brought about a revolutionary transformation in robotics and automation that affects every area, from domestic work in the home to the defense industry. Today's smart phones have revolutionized the global market by changing people's lifestyles and offering a wide variety of applications across various operating systems. One of these open source operating systems that has had a significant impact on society is the Android platform, which offers a wide range of robotics apps to assist people in their daily lives.

From domestic work in the home to the defense industry, technology has brought about a revolutionary transition in robotics and automation that impacts every sector. Because they alter people's lifestyles and provide a wide range of applications for different operating systems, today's smart phones have completely transformed the global market. The Android platform, which provides a wide choice of robotics programs to help people in their daily lives, is one of these open source operating systems that has had a tremendous impact on society.We talked about the alert generated by sensors in a previous project. However, in order to advance the project, we are now using cameras to capture people's images. Previously, we could only receive alerts when someone entered the area; however, with this technology, we can see clearly enough to identify the person responsible for the commotion. Therefore, we will use an Arduino Bluetooth Camera and ultrasonic technology to detect if a stranger has entered our home and take a photo of him once he enters the area of the ultrasonic wave.

II. LITERATURE SURVEY

A paper titled "Remote surveillance via web-controlled mobile robots" was given by Bei Wang, T.M. Sobh, and R. Sanyal in 2004 and published in World Automation Congresses. This model addressed visual remote surveillance through internet.Model of spy robot was built in RISC lab which was controlled by Internet. A paper titled "Remote surveillance via web-controlled mobile robots" was given by Bei Wang, T.M. Sobh, and R. Sanyal in 2004 and published in World Automation Congresses.

In 2010 Kyunhoog Kim presented “Intelligent surveillance and security robot systems” which was published on 28 Oct,2010.This paper put emphasis on the problem of signal range and adverse climatic condition which affected interfered with signal of the system.The purpose of this proposed system involved inclusion of enhanced security system which eliminate drawbacks of previous models.

Model proposed by Kyunhoog Kim included security solution which integrates excellent vision ,intelligent algorithm and enhanced technology. Previous models relied on Humans operators vigilance,proposed model compensated for human factors and generates automatic immediate counter response.[2]

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2012 saw the presentation of Myung Jin Chung's "System and Software architecture for autonomous Surveillance robots in urban environments." "System and software architecture for autonomous surveillance robots in urban settings" was the topic of Myung Jin Chung's presentation.This study was presented at the ninth annual Ubiquitous Robots and Ambient Intelligence (URAI) conference in Daejeon, South Korea.[3]

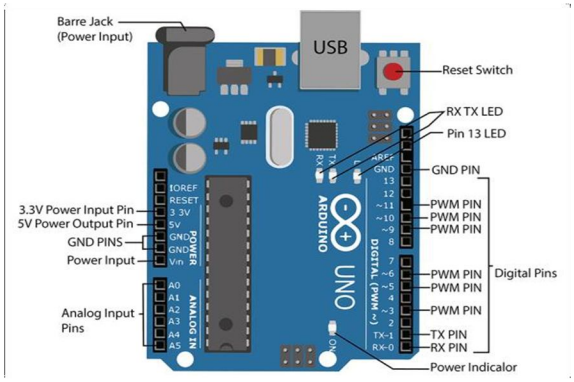
Ashish U. Bokade and V. R. Ratnaparkhe presented their "Video control using smartphone and Raspberry pi" proposed model in 2016. They described a way to control a spy robot using an Android platform software.[4]

T. Veeramanikandasamy gave a presentation titled "Implementation of spy robot for a system using Internet protocol of Raspberry Pi" in 2017.Robots in the model that is being shown automatically identify intruders and alert the security council to potential risks. The 2nd IEEE International Conference on Recent Trends in Electronics, Information, and Communication Technology (RTEICT), which took place in Bangalore, India, approved and published this article on January 15. [5]

III. COMPONENTS REQUIRED

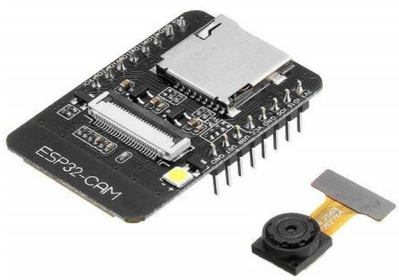
1) Arduino Uno
2) Motor Based Shield
3) Wifi Module
4) Usb Camera
5) Vehicle Chassis
6) Battery

a) Arduino Uno: A microcontroller board based on the ATmega328P is used. A USB port, 6 analogue inputs, a power jack, an ICSP header, and a reset button are among its features. It also has a 16 MHz ceramic resonator (CSTCE16M0V53-R0). The microcontroller's support needs are met by everything in the package. An AC-to-DC adapter, a battery, or a USB cable can all be used to power it up.



b) Dual H-Bridge motor driver L298N: Two DC motors can be simultaneously controlled for direction and speed using the L298N dual H-Bridge motor driver. The module has a maximum current capability of 2A and can run DC motors at voltages between 5 and 35V.

c) ESP32: One of the microcontrollers 802.11b/g/n integrated with dual mode 802.11b/g/n Wi-Fi is the ESP32.

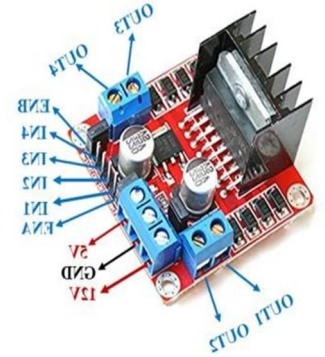


d) It supports both Bluetooth 4.0 (BLE) and Bluetooth Classic, according to Bluetooth (BT). Because it uses little money and electricity, it is more suited to carrying out projects. ESP Ressif Systems and a Chinese company with headquarters in Shanghai created, invented, and developed the ESP32 microcontroller. TSMC produces it using their 40 nm technology.

- ESP32 has secure boot to resist attacks
- It also has Flash encryption to encrypt the contents of ESP32
- It has 1024-bit OTP
- It has Cryptographic hardware acceleration to speed up the hardware performance and some of them are:

➢ Advanced Encryption Standard
➢ Secure Hash Algorithm
➢ Rivets, Shamir, Adelman algorithm
➢ Elliptic Curve Cryptography

e) Ultrasonic Sensors: An ultrasonic sensor is a device that uses ultrasonic sound waves to gauge the distance to a target item and then converts the sound's reflection into an electrical signal. In comparison to audible sound, or sound that humans can hear, ultrasonic waves move more quickly. A transmitter that generates sound by using piezoelectric crystals and a receiver that detects sound after it has travelled to and from the target make up an ultrasonic sensor.



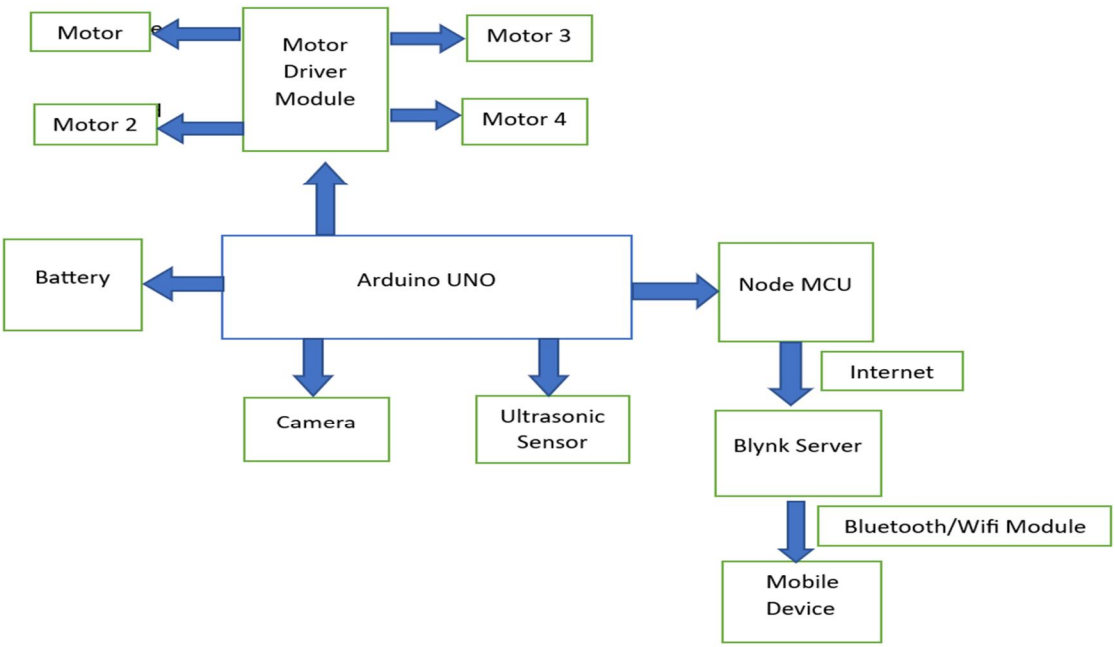


f) Jumper Wire: On printed circuit boards, electrical circuits that are located far apart are connected by a line of electricity called a jumper wire. By connecting a jumper wire to the circuit, it is possible to short-circuit and jump (jump) to another electrical circuit.



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IV. BLOCK DIAGRAM



V. APPLICATIONS

1) Military operations.
2) Surveillance along border.
3) Search and Rescue Operation.
4) Maneuvering in hazardous environment

VI. FUTURE ENHANCEMENT

One can reduce the size of the robot. This robot's range is one of its drawbacks. Since the bluetooth module being used here has a limited range, controlling this robot over a great distance is not possible. You may extend the range by inserting more modules like Wi-Fi and Zigbee. Future upgrades to the robot could include gas sensors to find dangerous substances in the surrounding air. In order to detonate bombs on the battlefield, the robot might also be equipped with bomb disposal equipment.

VII. CONCLUSION

In order to build a robot using a wireless night vision camera that is controlled by an Android application, the model of the robot can be explained in this paper. Readers can learn how to build Android applications for Android in order to control the robot wirelessly using the MIT App Inventor platform. Gas sensors and a bomb defuser kit are two characteristics that can be added to the robot to improve it.

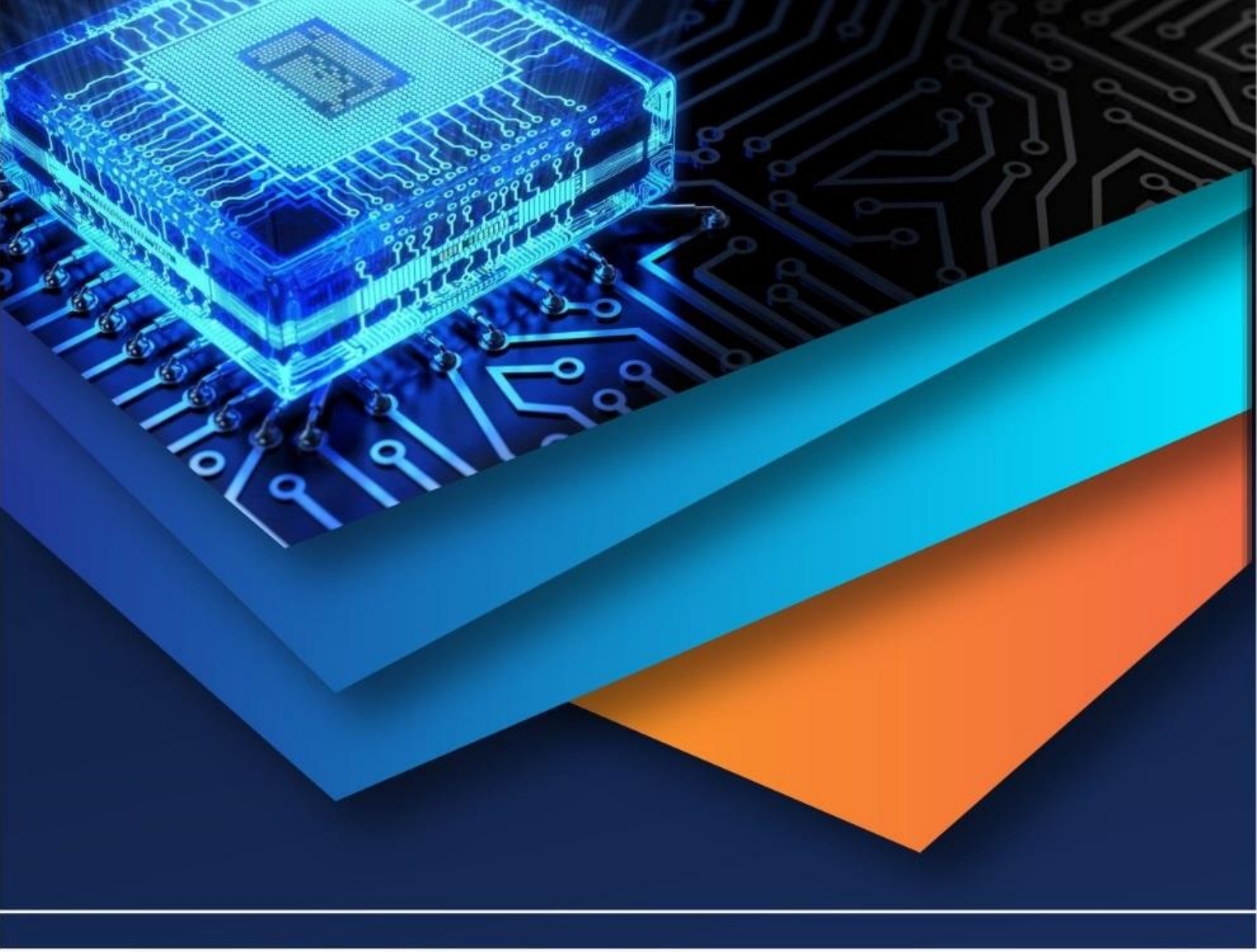
The user-friendliness of the war spying robot was its primary goal. The spy robot can move around with ease, take pictures, and wirelessly communicate them, alerting the soldiers to hazards and conditions on the battlefield. Depending on the input we provide through the transmitter (remote) part, the robot will move in the direction determined by the motors. Control signals are utilised on IoT modules. These signals are used for signal encoding and transmission through the transmitter. These decoded signals are provided as input to the motor driver at the receiving end. The robot is utilised for close-range monitoring, enhancing the local area's securitThis aids the forces in accurately observing what is now taking place in the immediate area and making appropriate future plans. As a result, we ought to be able to alter its course as required to build the robot securely. A control unit is required for all of this, and the RF signal from the control unit is utilised. These signals are used for signal encoding and transmission through the transmitter. These decoded signals are provided as input to the motor driver at the receiving end. Within short ranges, it can be used as a spy robot but not for long-range applications..

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