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A Review: Wireless Surveillance Robot Using GSM And RF Technology

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***Abstract*- The intellectual and emotional appeal of robots and robotic technology beyond that of any other engineering product, and this appeal is no longer present. therefore, with regards to kids and teens Robots and robotic technologies offer a very effective and adaptable way to illustrate a range of engineering ideas. They are a practical application of physics, science, engineering, and mathematics. In order to reinforce science and engineering theory and to teach basic software and mathematical engineering in grammar school, middle school, and high school, a growing number of educators are turning to robotic technology and robots. We think that robots, particularly security robots, will play a significant role in our daily lives in the future. Robots are operated using RF remote controls, Bluetooth, Wi-Fi, and other technologies in the prior approach. The use of these technologies, however, is restricted to a few domains and is therefore quite challenging to design. The lifespan of the robot is crucial since, in general, they are geographically dispersed, frequently in remote locations. To increase the lifespan of robots, electrical energy and electrical conservation are crucial factors. Robots use more power while the RF transmission is in progress. An ideal communication should be conducted in order to reduce the amount of electricity required. We have developed a mobile operated robot utilising a GSM module to get around the challenges. using a mobile device Robot is a mobile device that, until it loses signal on your phone, can be controlled wirelessly over a large area. The ability to be controlled from anywhere in the world is a broad idea behind mobile controlled robots. In order to spy on people less frequently, this project aims to build a GSM and RF-based surveillance robot with a wireless camera connected. This robot communicates with the base station by sending a signal using a wireless camera. One of the key applications of the research can be investigated using the android-based smart phone that could be used to control the robot's mobility. The signal is sent to the robot's receiver, which is mounted on the robot, by the robot's transmitter at the base station.**

I.INTRODUCTION

The primary goal of the project is to design a surveillance robot that can record events using a camera sensor, alert the user via an RF transmitter module, and be controlled by the user by both an RF and GSM module. The robot's obstacles sensor allows it to detect obstructions as well. One more effective tool is the GSM module. If the robot accidentally moves out of the RF signal's range, we can activate the GSM module and call the robot to get it back in range. This device is beneficial and practical for enemy surveillance purposes in defence areas where human access is prohibited. The major objective of this project is to develop an embedded system that controls the car using GSM technology and a wireless camera for spying purposes. From a defined location, the robot can be used to observe and record audio or video. This could be advantageous for both environmental monitoring for security and research purposes. The robot can remotely explore and gather data from hazardous or challenging to reach regions. The robot can instantly relay data or audio/video broadcasts to a remote location using the GSM module. The faster operating speed is the key benefit. One SMS message must be sent for each motion in SMS-based control. Yet in this case, we can execute several moves in a single call. Call-based regulating is more affordable than SMS-based controlling, which is another benefit. Robots that are controlled wirelessly in the traditional sense require RF circuits, which have restricted frequency range, working range, and control. Using a cell phone can help you get beyond these obstacles. It offers the benefits of strong

control, a working range as wide as that offered by the service provider, and no provider interference.

II.LITERATURE SURVEY

CHINNAM *et al* [1] suggest that the Internet of Things (IoT) is a network of physical objects, such as furniture, cars, and home appliances, which are equipped with electronics, software, sensors, actuators, and connectivity, allowing them to communicate and share data. Thereare many solutions for securing our homes on the market thanks to the development of technology. Such security systems are highly expensive to purchase. With the use of the Raspberry Pi, which is nothing more than a little computer, we can secure our homes at a fair price. The Raspberry Pi is integrated with a web camera and a PIR motion sensor, which takes pictures of intruders. A buzzer that notifies the neighbours of the intruder is there in addition to the image capture. The image taken by the web camera on the Raspberry Pi is delivered to our email via the WIFI. So, using a Raspberry Pi, we can manage and limit illegal access. With the help of camera we are able to view the things that are happening in the surrounding area where the robot is hidden. This kind of robot can be helpful for spying purpose in war field. The robot will move depending on the motor direction based upon the input. By keeping the circuit easy and simple, most of the users will be able to use it without any difficulty. Our designhas not caused any sort of disturbances and not for long range application it can be used as a spy robot within short distances.

Shakya *et al* [2] suggest that Robotics and automation have played a significant rolein addressing the shifting demands of people from the manufacturing to the home units with the goal of fulfilling and meeting these needs. The goal of this project is to create a GSM-based spying robot with a wireless camera connected that can spy on people less frequently. Using a wireless camera, this robot transmits a signal to the base station. The android-based smart phone that may be used to control the movement of the robot can be used to examine one of the project's main applications. The robot's transmitter at the base station transmits the signal to the robot's receiver, which is installed on the robot. This function allows the robot to send real-time videos while remaining undetectable to the enemy in a combat area. This kind of robot can be useful in the sphere of armed conflict for surveillance. Depending on the input, the robot will move in the direction indicated by its motors. The majority ofusers will be able to use the circuit with no problems if it is kept straightforward and easy to understand. Our design hasn't produced any disturbances of any kind, and while it's not intended forlong-range use, it can be utilized as a spy robot across small distances.

Nagarjun *et al* [3] suggest that Ocean exploration is essential to maintaining a stable climate worldwide. A data buoy that offers weather forecasts is one of the devices in use today. Large, heavy survey ships as well as expensive satellites are both used. We are developing a smart robotic vehicle that provides real-time video acquisition, precise location coordinates of the device to the user, metal detection, automatic and manual control of the device, and multifunctioning in order to solve the shortcomings of the current system. In this study, we design a smart robotic vehicle that is affordable, portable, uses less energy, and has a variety of uses for oceanographic research. This robot locates the system's location using GPS, detects metals in the water, and performs surveillance and rescue operations. This paper introduces a successfully operating prototype model of a mobile robot that can sail and is intended for oceanographic research. With the aid of a wireless camera linked to the robot and an RF PRO wireless sensor network, it monitors movement. To show that a Smart Robotic Vehicle is practical for long-term operation in open water and useful to scientists and oceanographers, further work needs to be done on it. High resolution and pixel counts enable the use of better cameras. Instead of employing power supply, a long-lastingbattery can be employed.

Shaikh *et al* [4] suggests that the goal of the project is to create a robotic car that can be operated remotely via an Android app and is equipped with a wireless camera for security purposes. Wireless real-time video transmission with night vision is possible between the robot and camera. This type of robot can be useful for spying in combat zones. Wi-fi technology is still in its infancy compared to other technologies. The Android software that is downloaded and installed on mobile devices has a user-friendly GUI and can link to security systems.The security system then replies to the user and executes these commands. The security system has a CMOS camera and a motion detector attached for remote monitoring. A robot is a device capable of performing a complex series of tasks automatically, particularly one that can be programmed by a computer. Human operators have the ability to command robots, sometimes from a vast distance. Wireless communication plays a bigger role in these types of applications. Safety is provided like thatof a man by surveillance security robot. Automatic patrol vehicles can move automatically to check dead zones and take pictures with a camera when patrolling a predetermined or restricted region ona regular basis. The wireless video surveillance robot that is controlled by an Android mobile smartphone isnow operational through the use of wireless Bluetooth technology, the android application successfully controls the robot. Wi-Fi technology is used to create a real-time video experience in our own Android application.

Balakrishnan *et al* [5] suggests that this study describes the design and characterisation of a wireless charging and controlling surveillance robot. The suggested system consists of a wireless control station, a surveillance robot, and a wireless charge transmitter. The surveillance robot has three wheels and is rectangular in design. Through a wireless medium like Bluetooth, it communicates with the device. Robots have sensors for temperature, humidity, ultrasonics, and PIR.The robot's humidity is detected via a humidity sensor. According to the numerical temperature value, a temperature sensor detects climate changes. The object that must be passed by the robot isdetected using an ultrasonic sensor. PIR sensors detect the presence of people close to the robot. A GSM module can be used to receive these sensor notations and the information on a mobile device. Every change can be felt, and it can be viewed in a mobile device through a message. All of the othermodules are powered by the robot's battery, which is charged through the wireless charging system. It has a wireless camera for border surveillance purposes, and Bluetooth and RF frequenciesare used to control the robot over wireless communications. Robot is charged wirelessly using the electromagnetic induction process to increase the battery's capacity for reuse. Robots have sensors like humidity sensors and ultrasonic sensors.

D. PRIYANKA *et al* [6] suggests that in order to outfit a mobile robot for a surveillance mission, the goal of this article is to automatically recognise and detect motion surrounding a robot's environment. Sensor, control, and planning subsystems have been separated out into the robot design. A drive chassis with a drive motor and a drive element is part of a robotic system that controls the robot's movements as well as the rotation of a wireless camera. Robot is always pointedin the direction of the intended position thanks to the PIC16F877 microcontroller. The objective of this article is to automatically recognise and detect motion surrounding a robot's environment in order to outfit a mobile robot for a surveillance mission. The robot design has divided the subsystems of planning, control, and sensing. A robotic system that regulates the movements of the robot as well as the rotation of a wireless camera includes a drive chassis with adrive motor and a drive element. The PIC16F877 microcontroller ensures that the robot is always headed in the direction of its planned location.

Mashrik *et al* [7] suggests that nowadays, a variety of security and surveillance applications use mobile robots extensively. The paper involves the design and development of an autonomous security robot that may be utilised in the home or business. The concept is divided into four basic components: a multiple sensor array, a communication system (Bluetooth and GSM), motion planning (autonomous patrolling), and software application for mobile interface. The mobile application interface is user-friendly and easy to use, and it also makes it simple to interact with the robot using a mobile phone. In order to effectively monitor security and preventfalse alerts, it has a multi sensor feature. The findings of the test operation of a security service system with an autonomous guard robot show that a mobile security system is more effective.

Shri *et al* [8] suggests that the usage of military robots to support soldiers on dangerous operations is becoming more and more popular. The design and construction of a semi-autonomous, unmanned robotic system employed in various military and search and rescue missions is the main topic of this study. The Military Support and Rescue Robot is capable of handling bomb disposal, enemy attack, search, and rescue tasks well. Sensors and a camera are on it. It is possible to transmit and receive data using an Arduino and a Nordic radio frequency module. Improve search and rescue technology is important because it can save many lives by quicklymapping and assessing damage, can help a community rebuild and recover much faster. The military rescue and support robot used in this project will assist you in carrying out several rescue operationsand saving many lives.

Sumathi *et al* [9] suggests that the construction of a robot called Cyborg is described in this paper. It is designed to roam around a certain area in the chemical industry while monitoring theenvironment for conditions like gas levels, etc. The information it gathers is then shown on an IoT website over the internet. With the aid of a wireless Pi camera included within the bot, live video is also streamed on the IoT portal. The Internet of Things allows any device, such a mobile phone or laptop, to manually manage this cyborg robot as necessary through the IoT portal (IoT). Anyone withaccess to the Raspberry Pi's IP address can observe live streaming and sensor data (current temperature, gas levels, and presence of obstacles ahead) on the IoT page from any location at any time with only an internet connection. Every time the observed sensor values exceed the critical threshold, the bot additionally SMSs an alarm to the supplied contact. The available robots are built with either a surveillance capability or the ability to collect data using sensors, but this research combines the two for improved industrial management. In order to implement continuous monitoring utilising more advanced technologies like IoT, this paper explores the application of robotics in the sphere of surveillance and security. The createdrobot has demonstrated improved productivity in both its working and IoT-based data communication. The robot guards against gas leaks in chemical companies and other similar businesses, and it quickly sends an SMS message to the person in charge to warn them of any severe conditions. This robot can be improved even more by giving it intelligence and adding capabilities like face recognition and intelligent mobility.

Li *et al* [10] suggests that the creation of a broad class of security robot that combines mobile robot technology with security and information technology can address indoor security issues like fire, intruder, smog, and others. In this study, feature recognition technology and the development of an approximative arc motion model work more effectively to aidthe robot in learning its environment than a single incremental motion model strategy. Multi-sensor units and techniques have been developed to help the robot gather more security data in an interior environment. A task/behaviour hybrid control architecture for the autonomous robot system is suggested, which can manage user multitasking. Finally, a multi-channel HRI (Human

Robot Interaction) system based on the concept of human-friendly communication is created.

With regard to mobile robot technology, we first use the approximative arc motion model to pinpoint the robot's location in the surrounding area and map out the buildings using ultrasonic sensors and the Hough transform. Then, in order to collect data on the security of the indoor environment, we design a multi-sensor unit. After that, we suggested a hybrid task/behaviour control structure to address the issues with multi-user synchronous operation and multi-object behaviours. Additionally, we concentrate on multichannel human-friendly Human-Robot interaction systems that provide timely security and information services to users, as well as local and distant monitoring and operation of security functions, when it comes to information technology and security.

III.CONCLUSON

We can see what's going on in the region around the robot's covert location with the aid of the camera. This kind of robot can be useful in the sphere of armed conflict for surveillance. Depending on the input, the robot will move in the direction indicated by its motors. The majority of users will be able to use the circuit with no problems if it is kept straightforward and easy to understand. Our design hasn't produced any disturbances of any kind, and while it's not intended for long-range use, it can be utilised as a spy robot across small distances. Its wireless camera transmission allows it to function as a border surveillance robot, and Bluetooth and RF frequencies are used to control it. Robots are equipped with sensing devices like humidity sensors and ultrasonic sensors. Robot proximity to objects in its path is measured using an ultrasonic sensor. Consequently, this robot functions as a wireless, microprocessor-controlled robot.

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