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WOMEN SAFETY NIGHT PATROLLING ROBERT

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ABSTRACT: An automated security patrol that employs a night vision camera to safeguard any location. The robotic vehicle has a camera and sound sensors for night vision, and it moves at various intervals. It patrols its route using a predetermined line. It pauses at various locations and moves on to the next location if sound is detected.

To patrol the allocated field, system uses the following IR-based path system. It monitors every area using camera to detect any intrusion. It has the capability of tracking sound at the premises. Any sound after the firm is closed and on its predefined course it begins moving towards the sound. It then scans the area using its camera to recognize human face found. It records and begins to relay photographs of the situation immediately after identification of the sound or human face. Here, we use the Internet of Things Local Area Network (LAN) to receive transferred photos and show them to the user along with warning sounds. Therefore, in order to safeguard the facility, we are suggesting a completely autonomous security robot that operates around-the-clock and patrols large regions by itself.. various industries and sectors, and one of the most promising areas is robotics. In this context, an IoT-based night patrolling robot has been designed and developed to enhance the security measures in residential and commercial premises during the night hours. This robot is equipped with sensors, cameras, and wireless communication modules that allow it to collect and transmit real-time data to a central control system. Through a web-based interface, the robot can also be remotely controlled and observed, allowing operators to quickly identify and address any security issues. By eliminating the need for human intervention and cutting down on operating expenses, the deployment of an IoT-based night patrolling robot can greatly increase the security and safety of a variety of assets.

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I. INTRODUCTION

It's possible that a sizable percentage of Indian businesses have recently experienced data theft problems. According to a poll conducted by a risk management and consulting organization and published on Monday, almost 41% of these businesses experienced such incidents, compared to the global average of 29%. Compared to the United States, the United Kingdom, and Japan, India has a larger number. An innovative development in cutting-edge security and surveillance technology is the autonomous security robot. Guards patrolling an area with flashlights and batons never worked very well; however, today there is an immergence of smart security systems with intelligent sensors, embedded systems, autonomous control mechanism and mobile application.

Everett, H. & Gage, D.W. (1999) suggested the first security surveillance robot in their paper "Mobile Detection Assessment and Response System (MDARS)". Since then, there has been an increase in interest in security robots due to advancements in application and research. This is done with the intention of securing the entire structure or property. Any small sound results in the alert and robot automatically goes to the area and captures the image of that area and sends it to the user. The camera plays an important role in making an automatic robotic system. During the occurrence of an abnormal event like theft, the patrol robot detects the sound and captures the image of the intruder. The security department receives the image of the invader by short messaging and email. The standard fixed surveillance system's dead zones can be monitored by an automated patrolling vehicle, which serves as a security patroller in the system.. Countless applications today are mobile service security robots, including autonomous navigation, security patrolling, housework, search-and rescue operations, material handling, manufacturing, and automated transportation systems. Autonomous navigation remains one of the primary challenges in the mobile- robot industry; many control algorithms and techniques have been recently developed that aim to overcome this challenge. We use line follower with IR Sensors to perform night patrol navigation. The security patrol robot will utilize several sensors and motors to navigate indoors. It will also be able to communicate and be controlled via Wi-Fi.

a.**Problem Statement**: In many regions of the world, women's safety is becoming a serious concern, and in remote areas, both men and women continue to worry about their safety. Women make up half of the global population. However, their ability to live with honor and dignity has always been a worry, whether they are on the roads, trains, taxis, schools, or wherever else. Women's empowerment in the country can be achieved once their safety and security are assured, whether at home, in isolated locations, or while traveling.

II. OBJECTIVE

The proposed system, Arduino is installed with the night vision camera that helps the system find the intruders and go for the automation. The robot covers a specific area and checks for any intruders when an intruder is detected, the owner is alerted by the buzzer sound. We propose a robot patrolling security which uses night vision camera to secure any premises. The robotic vehicle moves at specific intervals and is equipped with camera and sound sensors for night vision. In patrolling it uses a predefined line to follow its path. It stops at specific points and if sound is detected moves to next points. To patrol assigned area, the system uses IR-based path

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following system. It monitors each area using camera to detect any intrusion. It is capable of tracking sound at the premises. Any sound that occurs after the business closes and its predetermined course starts to approach the sound. After then, it uses its camera to look around for any identifiable human faces. As soon as it detects a sound or a human face, it records the scene

III. LITERATURE

1.Literature Survey

Jian Wang et.al (2011) proposed an embedded remote video control device, focused on ARM and motion Stimulus algorithm. Harbin Herlongjiang proposed current H.264 codec-based video chaotic encryption schemes may be applied to two classes: before H.264 encoding, the original video data is encrypted with chaos; after H.264 encoding, it is encrypted with chaos. The main disadvantage of the classes of schemes is that the contradictory problem between desirable safety and rapid frame rate is not well resolved. This paper presents a novel H.264 codec-based video-chaotic encryption scheme cope with the problem, where the original video data is encrypted by a stream cipher and position scrambling with chaos after H.264 encoding. In particular, H.264 hardware encoding, multi-core multi-threading, H.264data format protection and adaptive memory selection strategy are adopted for making the suggestion.

V. Shinde et al. (2019) developed Design and Implementation of a Remote Controlled Night Patrolling Robot Using IoT a remote-controlled night patrolling robot using IoT technology. The robot is equipped with various sensors, including temperature, gas, and motion sensors, which are used to detect any potential security threats. The robot can be controlled and monitored remotely through a web-based interface, which provides real-time data and alerts everyone possesses grate danger. By using the technology of combined minds of different fields we can make use of the robots. As you can see these robots are being used in wide range, both autonomous and manually. Robots are being used in military operations and transportation also.

IV. PROPOSED SYSTEM

An IoT-based night patrolling robot is a machine designed to patrol an area during the night while utilizing internet connectivity and sensors. Its primary objective is to ensure the safety and security of the area by identifying and reporting any unusual or suspicious activity.

`The robot's design should enable it to navigate easily without getting stuck or damaged and withstand harsh weather conditions. Sensors such as infrared, ultrasonic, LIDAR, motion, and sound should be incorporated into the design to detect obstacles and unusual activity. Additionally, the robot should be connected to the internet and equipped with a powerful processor and memory for data storage and processing. It should have a reliable power source, preferably rechargeable batteries, to sustain it for long hours. Security features should also be included in

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the robot's design to prevent unauthorized access or control.

4.1 APPLICATION

Used for the safety of women
Used for the safety of children
Used for the safety of physically challenged people
Applicable as legal evidence of crime
Remote regions can likewise be investigated

4.2 FLOWCHART

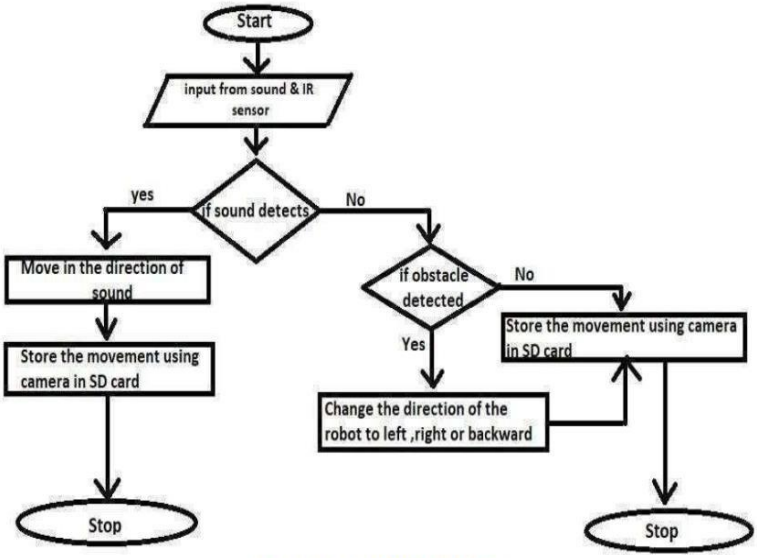
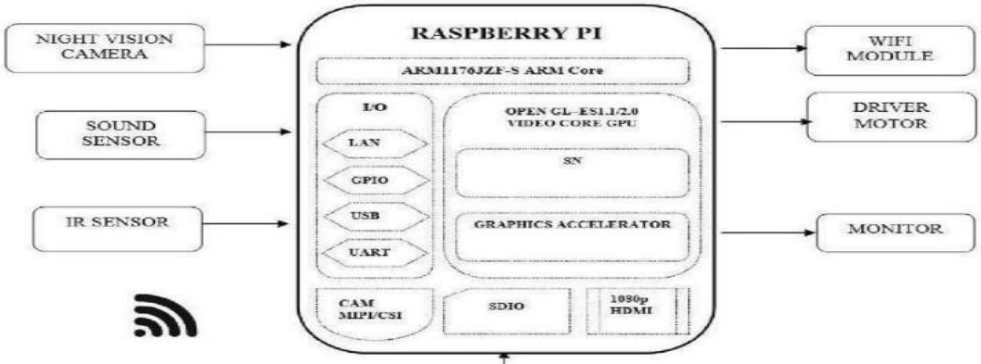


Fig: 3.1: FLOWCHART

Using strength statistics, the robot looks for a fine course first. While on patrol, the robot follows any intruder sit detects, takes a photo of them, and uploads the images in real time. All inspection factors are identified and signed in electronically by the robotic strategies, after which the inspection aspect variety and sign-in time are uploaded.

4.3 BLOCK DIAGRAM OF NIGHT PATROLLING ROBOT



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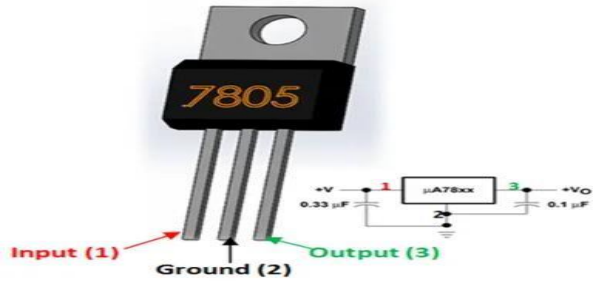
V. HARDEARE DESCREPTION

1.Battery

Function: The power source for the entire system, providing the required voltage for the components.
Common Types: Lithium-ion or LiPo (7.4V, 11.1V).
Connection: Powers all components, often through a voltage regulator.

Voltage Regulator



Function: Ensures stable voltage is provided to sensitive components like microcontrollers and sensors.
Types: Commonly 7805 (5V), LM317 (adjustable), or buck converters.
Connection: Battery → Voltage Regulator → Microcontroller/Sensors.

3. Four Sound Sensors

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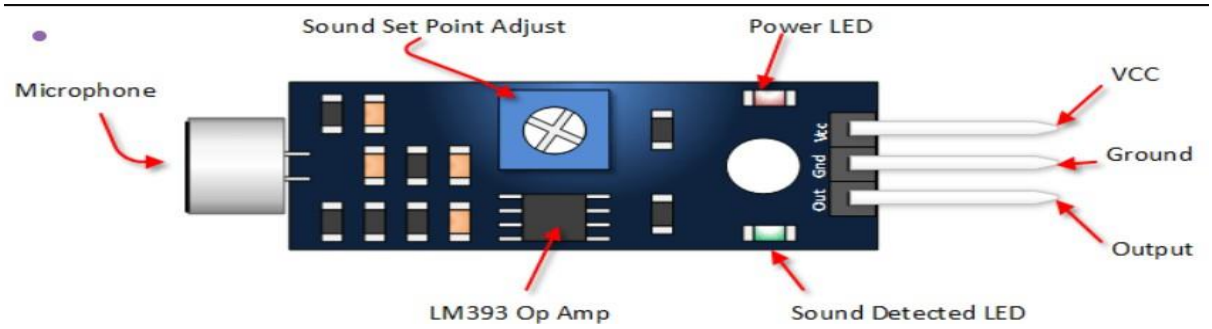

Function: Detects sound waves or noise and converts them into electrical signals.
Types: Microphone sensors like KY-038.
Connection: Output of sound sensors connected to the microcontroller for sound detection/analysis.

4.GPS Module

Function: Provides real-time location tracking for the robot.

Types: NEO-6M, Ublox GPS.
Connection: Connected to the microcontroller via UART or I2C to send location data.

VI. SOFTWARE DESCREPTION

Description Eagle, a renowned PCB design tool from Autodesk, is used extensively to create intricate PCB layouts for electronic components. It has functions like board layout, schematic capture, and an auto-router that facilitates the automatic joining of component traces.

Features:

Schematic Editor: Allows for creating electronic circuit diagrams.
PCB Layout Editor: Translates the schematic into a physical layout.
Auto-Router: Automatically generates optimal routing for PCB traces.

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Libraries: Extensive libraries for standard components.

Software Use:

Create a new project, select the Schematic Editor.

Drag and drop components from the library to design the circuit.

Switch to Board Layout and arrange components on a PCB.

Arduino IDE

Description: Arduino IDE is an open-source software that allows you to write, compile, and upload code to Arduino boards. It's highly accessible and used for developing embedded systems and simple microcontroller-based applications.

Features:

Code Editor: A basic text editor for writing code in C/C++.

Debugger: Compile and debug code before uploading.

Library Manager: Access thousands of Arduino libraries for sensors, motors, etc.

Serial Monitor: View real-time data from Arduino boards.

Software Use:

Write code in the Editor.

Click Upload to send the code to the connected Arduino board.

Use the Serial Monitor to test data communication with the board.

Advantages:

Proactive Prevention: The robot can patrol areas and detect suspicious activities before incidents escalate.

24/7 Monitoring: Continuous patrolling without breaks ensures round-the- clock safety for women.

Reduced Dependency on CCTV: Unlike traditional CCTV systems, the robot actively surveys and responds to abnormal behaviour.

Immediate Response: It can alert authorities in real-time, reducing the response time in emergencies.

Non-human Bias: Being robotic, it eliminates human error or prejudice in surveillance tasks.

Disadvantages:

Limited Autonomy: Patrolling robots may face technical limitations, such as battery life or environmental challenges.

Cost: Initial development, deployment, and maintenance costs could be high.

Privacy Concerns: Continuous surveillance may raise issues about privacy for individuals in public spaces.

False Alarms: Misidentification of behaviors could result in unnecessary alerts and intervention.

Vandalism Risk: The robot could be damaged by individuals' intent on disrupting its operation.

Application:

Public Spaces: Patrolling high-risk areas such as parks, streets, and transit stations to ensure women's safety.

Workplaces: Surveillance in industries with reported cases of harassment or gender-based violence.

Night Patrolling: Focus on poorly lit or secluded areas to deter crimes during night hours.

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VII. CONCLUSION

This gadget is an intelligent, self-sufficient method of night vision patrolling. It entails building a security robot that employs a night vision camera to protect its environment. Unquestionably, improvement would lead to a notable rise in security. This study proposes a strategy for designing a robot for observation.. Using the concept of IOT, it solves the problem of limited extent observation. With the help of a PC/portable, one can physically monitor the robot, such as taking desired pictures and adjusting camera settings such as Brightness, Shutter speeds, Exposure, and so on. Checking by programme should also be feasible. Along these lines, this Robot is small in scale and moves into territories where human access is impossible. The Robot is difficult to spot and blends in with the surroundings. One of the most important advancements in the gadgets sector is remote innovation. This breakthrough is being used to support our company as a crucial piece of reconnaissance. This results in a highly efficient and functional robot that reduces human labor while still performing convincing checking tasks

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