INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.379

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details

IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Special Issue 3, November 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 11, Special Issue 3, November 2023 ||

Smart Night Patrol Robot

Mr. P. Manivannan, R. Renuka, P. Shirisha, IK . Swathy S. Varshini,

Associate Professor, Department of Electronics and Communication Engineering, Adhiyamaan College of Engineering, Krishnagiri District, Tamil Nadu, India [1],

U.G Scholars, Department of Electronics and Communication Engineering, Adhiyamaan College of Engineering, Krishnagiri District, Tamil Nadu, India. [2, 3, 4,5]

ABSTRACT: The implementation of an IOT-based smart night patrolling robot is presented in this paper, utilizing an Arduino Uno, camera module, sound sensor, ultrasonic sensor, motor driver, motors, Nodemcu and buzzer. The proposed robot is designed to autonomously patrol a designated area and capture images and videos of the area using the camera module. The ultrasonic sensor is used to detect obstacles and prevent collisions, while the sound sensor is used to detect unusual sounds and alert the user. The robot is designed to move around and change directions using the motor driver and motors, which are operated by an Arduino Uno. The proposed system can be used for a variety of applications, such as surveillance and security, and has the potential to improve the efficiency and effectiveness of night patrolling operations. The proposed system is developed at a low cost, making it accessible to a wider range of users. The implementation of the proposed system has been tested, and the results indicate that the system is efficient and effective in detecting and responding to environmental stimuli. The system is controlled using a web-based interface, and the users can monitor and control the system remotely.

KEYWORDS : motor Arduino Uno, sound sensor, Nodemcu, ultrasonic sensor, driver and buzzer

I.INTRODUCTION

The world of technology has been advancing rapidly in recent years, and one of the most significant developments has been the rise of the Internet of Things (IoT). The IoT has enabled us to connect devices and systems through the internet, making it possible to automate and control many aspects of our lives. One area that has seen a significant impact from IoT technology is the field of security, particularly with regards to patrolling and surveillance. Smart security systems are becoming increasingly popular, and one application that is gaining traction is the use of IoT-based smart night patrolling robots. An IoT-based smart night patrolling robot is a robotic system equipped with sensors and connected to the internet. It is designed to patrol a designated area, monitor it for any signs of intruders, and alert the appropriate authorities if it detects any suspicious activity. The robot is designed to operate autonomously, eliminating the need for human intervention.

The rise in security concerns has led to an increasing demand for effective night patrolling. Traditional patrolling methods rely heavily on manual labor, which can be costly and inefficient. Advances in technology have led to the development of smart robots that can be used for various applications, including night patrolling. IoT-based smart robots are gaining popularity due to ability autonomously patrol designated areas and detect and respond to various environmental stimuli. In this paper, we present an IoT-based smart night patrolling robot using an Arduino Uno, camera module, sound sensor, ultrasonic sensor, motor driver and motors, Nodemcu, and buzzer. The proposed system is designed to patrol a designated area autonomously and capture images and videos of the area using the camera module. The Nodemcu provides internet connectivity, enabling remote monitoring and control. The proposed system is controlled using a web-based interface, allowing users to monitor and control the system from anywhere. The users can receive real-time updates, enabling them to detect and respond to any unusual activities in the patrolling area.

II. RELATED WORKS

In this survey regarding Night patrolling robot, we learned about how to operate a patrolling robot in assigned area and monitoring it through the ESPCAM 32. And also, some characteristic features of sensors like sound sensor, ultrasonic sensor and IR sensor. In this paper the surveillance robot travels at pre-defined path in a particular interval to surveillance the given path and observe that surroundings. If any sound is recognized the robot moves to that place and start scanning the location in that direction. The robot uses the IR-based path following system to patrolling the allocated area. With the help of ESP32 CAM.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 11, Special Issue 3, November 2023 ||

This LAN receives the images and location that are transmitted from the situation by the robot, displaying them with warning sounds on the screen to the user in the center. With the help of nearby rescue teams to go to that premises as soon as possible. [2] In this paper, they used RF based controlling system to manage the path of robot with a 360-degree rotating camera. It scans the entire area and when the sound is detected it edges towards the sound. While its scanning, when a human face is detected then it obtains the images and send it to user, via RF2.4GHz with an alert sound. It also has alarm, SOS light and even safety app for this critical environment. [3] In this paper they created a priceless and also high quality security robot. The aim of this project is to make it without insisting human being wirelessly controlled by AI. The robot also performs some other tasks like it searches the region and notify the control room. Some of the eye components for this project are Raspberry pi, ultrasonic sensor, GPS module.

III.EXISTING METHOD

In this survey regarding Night patrolling robot, we learned about how to operate a patrolling robot in assigned area and monitoring it through the ESPCAM 32. And also, some characteristic features of sensors like sound sensor, ultrasonic sensor and IR sensor. In this paper the surveillance robot travels at pre-defined path in a particular interval to surveillance the given path and observe that surroundings. If any sound is recognized the robot moves to that place and start scanning the location in that direction. The robot uses the IR-based path following system to patrolling the allocated area. With the help of ESP32 CAM, it recognizes the sound at the surrounding it move to that place and records the photographs and sends them to the local area network (LAN). This LAN receives the images and location that are transmitted from the situation by the robot, displaying them with warning sounds on the screen to the user in the center. With the help of nearby rescue teams to go to that premises as soon as possible. [2] In this paper, they used RF based controlling system to manage the path of robot with a 360-degree rotating camera. It scans the entire area and when the sound is detected it edges towards the sound. While its scanning, when a human face is detected then it obtains the images and send it to user, via RF2.4GHz with an alert sound. It also has alarm, SOS light and even safety app for this critical environment. [3] In this paper they created a priceless and also high quality security robot. The aim of this project is to make it without insisting human being wirelessly controlled by AI. The robot also performs some other tasks like it searches the region and notify the control room. Some of the eye components for this project are Raspberry pi, ultrasonic sensor, GPS module.

IV.PROPOSED SYSTEM

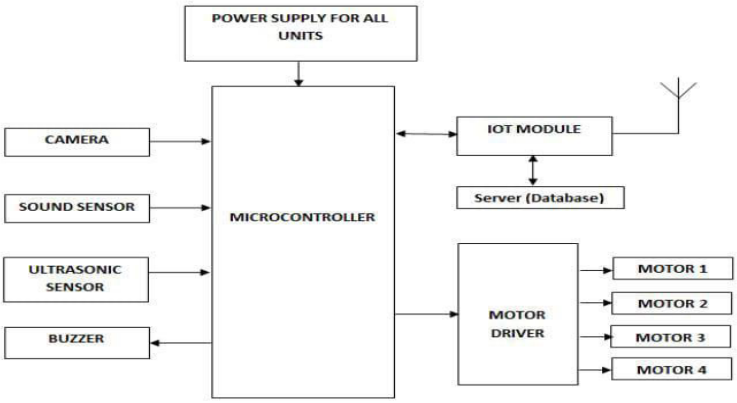
In this proposed theory, we use Arduino which is mounted with ESPCAM 32 that makes this system autonomous. Sound sensor is being used to find out the sound arising. If human intervention or anything is In this proposed theory. which is mounted with ESPCAM 32 that makes this system autonomous. Sound sensor is being used to find out the sound arising. If human intervention or anything is discovered then it goes to that location, immediately start to scan it and the corresponding information is sent to the user. In this robotic system we used ultrasonic sensor in order to avoid the obstacle and continuously move on that area. Motors are controlled by L298N motor drivers. Power supply is provided component wise by 12V to 3.3V convertor discovered then it goes to that location, immediately start to scan it and the corresponding information is sent to the user. In this robotic system we used ultrasonic sensor in order to avoid the obstacle and continuously move on that area. Motors are controlled by L298N motor drivers. Power supply is provided component wise by 12V to 3.3V convertor.

V.BLOCK DIAGRAM

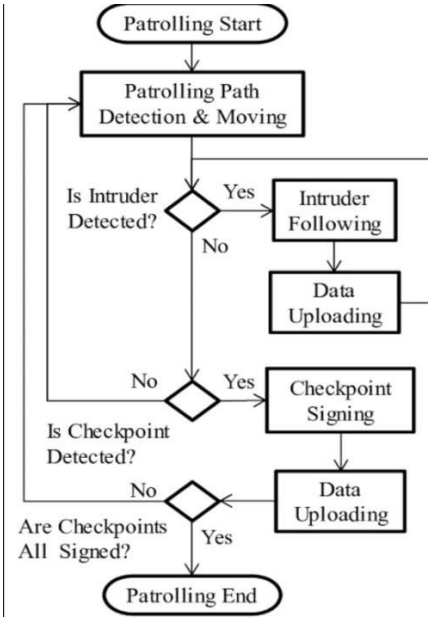
The robotic vehicle moves at particular intervals and is equipped with Mini Night Vision Bullet Cameras and Stereoscopic Microphones. It utilizes a predefined line to follow its way while patrolling.It stops at specific focuses and moves to next focuses if sound is recognized.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 11, Special Issue 3, November 2023 ||



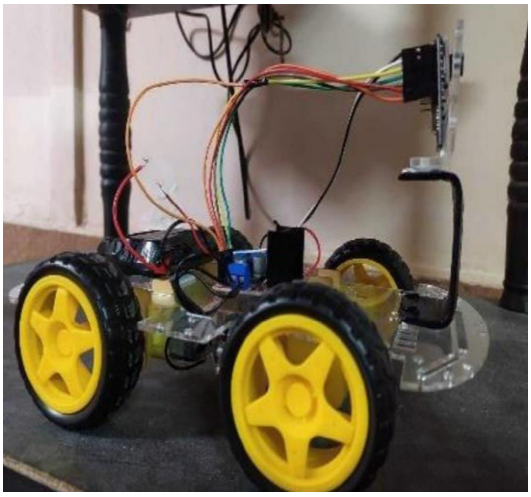
VI. FLOW DIAGRAM



VII. EXPERIMENTAL RESULTS

Therefore, we concluded that this project using Arduino and ESPCAM32 will surveillance and patrol in the assigned area.

So that it is useful for women safety and also used to monitor the particular area. In order to avoid the obstacle, we used to be ultrasonic sensor. To detect the sound and capture it we used ESPCAM 32 and sound sensor. Output of Night Patrolling Robot Wireless robotic technology can be used in industries so that the labor cost for the industries will be reduced. It can also be used as a child monitoring system so that the parents working in office can monitor their child.



VIII. FUTURE SCOPE

The night patrol robot plays a major role in safety measures like protection of fire incidents, vehicles theft, medical assistance, regular patrolling, and finally the protection for women's especially during nighttime in public areas. Patrolling Robots are designed to assist women from dangerous situations.
An IoT-based smart night patrolling robot is a robotic system equipped with sensors and connected to the internet. It is designed to patrol a designated area, monitor it for any signs of intruders, and alert the appropriate authorities if it detects any suspicious activity.

IX. CONCLUSION

In conclusion, the IoT-based smart night patrolling robot is a significant advancement in the field of surveillance and security. The integration of various components such as the Arduino Uno microcontroller board, camera module, sound sensor, ultrasonic sensor, motor driver, motors, Nodemcu, and buzzer have enabled the development of a system that can patrol a designated area autonomously and provide realrealtime feedback to the user. The web-based interfaceenables the user to monitor and control the system remotely, enhancing the system's accessibility.The proposed system has the potential to be expanded and customized to suit various applications, making it a versatile solution for surveillance and security. The system has the potential to reduce the reliance on manual labour in night patrolling operations, reducing the risk of human error and improving the efficiency and effectiveness of the process. Overall, the proposed system is a significant advancement in the field of night patrolling operations, offering enhance surveilla cost-effectiveness, and efficiency. The system has the potential to improve the safety and security of various applications such as industrial sites, residential areas, and public spaces. The proposed system is a valuable contribution to the field of IoT-based robotics, offering a reliable and cost-effective solution for surveillance and security.

REFERENCES

1.Study of women safety night patrolling robot –Shinde kiran, Nimse vaibhavi , Gawali durga – April 2020
2. Night Patrolling Device – ref by Prof . Mohammed Hassan , Sameer Dongre, Nishant Gadhawe , Rahul Urkude , Bhushan Kohade , Rahul Tayde ,Parish Swami -27 july 2021
3. Women Safety Night Patrolling Robot – Abilash Reddy Komatireddy , Kota Ramprasad Reddy , Bargavboini, Dr. G.Ganesh Kumar – 9 june 2022
4. Survillance monitoring using ESP32 CAM Module – Dr.P.D Selvam, K Nikhil, K Ranjitha Reddy, A Mounika, P.Reddy Sekhar, M. Reddy Siva Sai- 4thapril 2022
5. Surveillance Patrolling ROBOT Using ArdunioNanoDr.Rambabubusi,B.SaiSreeValli,K.Vijayachandana N.Rama Krishna Rao ,R.Leela Lavanya –April 2022
6. IOT Night Safety Patrolling Robot-ref by Mrs.Suvarna S Patil BE Assistant Professor Dep ECE ,RYM Engineering –issue 2022
7. Line following robot with object avoidance using aurdino – ref by Savita Mamadapur, Deekshit reddy, L.R Abhishek, Jagadeesh G.P, Karthik.H –2022.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 11, Special Issue 3, November 2023 ||

BIOGRAPHY

Mr. P. Manivannan,
Associate Professor,
Electronics and Communication
Engineering Department,
Adhiyamaan college of
Engineering,
Hosur

Renuka. R,
Electronics and Communication
Engineering Department,
Adhiyamaan college of
Engineering,
Hosur

Shirisha. P
Electronics and Communication
Engineering Department,
Adhiyamaan college of
Engineering,
Hosur

Swathy. IK,
Electronics and Communication
Engineering Department,
Adhiyamaan college of
Engineering,
Hosur

Varshini. S
Electronics and Communication
Engineering Department,
Adhiyamaan college of
Engineering,
Hosur