
IOT BASED NIGHT PATROLLING ROBOT USING ARDUINO AND ESP-32

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ABSTRACT:- Now-a-days safety is the most important factor for human life. By taking the responsibility for the safety of public, police officers are doing patrolling at night times. Even though they are doing their duties, many illegal incidents are being happened like ATM Robbery, Women Safety, Theft. At that time, police officers may also be in danger while trying to protect the public from those incidents.

So, here our paper is a security patrolling robot which uses night vision camera and sound sensors. The robotic vehicle moves at particular intervals. It uses a pre-defined line to follow its path while patrolling. Its stops at particular points and moves to next points if sound is detected. The system uses IR based path following system for patrolling assigned area. It monitors each area to detect any intrusion using 360 degree rotating HD camera. It has ability to monitor sound in the premises. Any sound after company is closed and it starts moving towards the sound on its pre-defined path. It then scans the area using its camera to detect any human faces detected. It captures and starts transmitting the images of the situation immediately by sound or human face detection. Here we use the IOT local area networks(LAN) for receiving the transmitted images and displaying them to user with alert sounds. Thus, we put forward a fully autonomous security robot that operates tirelessly and patrols large areas on its own to secure the facility.

KEY WORDS: - Women Safety, Security, Patrolling Robot, Sensors.

1. INTRODUCTION

Robotics is a multidisciplinary discipline that combines computer science and engineering. Robotics is the study of the design, function and application of robots. Robotics aims to create robots capable of assisting humans and human aids. Patrolling is nothing but keeping track of an area. Night patrolling robot makes the best use of its features for smooth operation. It can detect the obstacles and has IOT features to show off its senses. With the help of a camera, a GPS module and a Bluetooth module. All its functionalities are correctly coordinated using a microcontroller. The idea behind that is to protect the area as a whole. Any small sound resulting in sending through the Blynk robot to the person concerned. We can control the robot in two ways either in wired or wireless. GSM is used within this module and MCU is used for camera support mode. Any small sound resulting in the alarm and robot will automatically go to the area and capture the area's image and send it to the user. In making an automated robotic device,

Node MCU and ESP36 connected to the camera plays an important role. The robotic vehicle travels at different intervals, and is fitted with camera and sound sensors for night vision. It has the capability of tracking sound at premises. Robot patrolling is primarily used in the military zone, hospitals, shopping malls, national functions, industrial fields.

2. EXISTING METHOD

Closed-circuit television (CCTV), also known as video surveillance, is the use of videocameras to transmit a signal to a specific place, on a limited set of monitors. It differs from broadcast television in that the signal is

not openly transmitted, though it may employ point-to-point (P2P), point-to-multipoint (P2MP), or mesh wired or wireless links. Though almost all video cameras fit this definition, the term is most often applied to those used for surveillance in areas that may need monitoring such as banks, stores, and other areas where security is needed. Though videotelephony is seldom called 'CCTV' one exception is the use of video in distance education, where it is an important tool.

3. PROPOSED METHODOLOGY

An Internet Protocol camera, or IP camera, is a type of digital video camera that receives control data and sends image data via the Internet. They are commonly used for surveillance but unlike analog closed-circuit television (CCTV) cameras, they require no local recording device, only a local area network. Most IP cameras are webcams, but the term IP camera or netcam usually applies only to those that can be directly accessed over a network connection, usually used for surveillance.

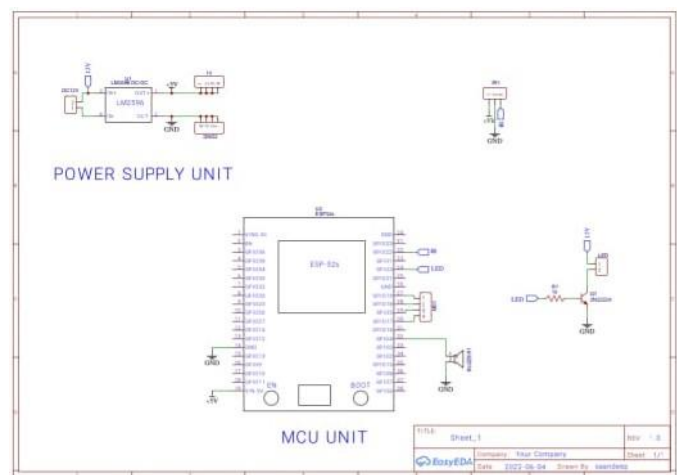


FIGURE 1: BLOCK DIAGRAM

BLOCK DIAGRAM DESCRIPTION

- In this paper IR Sensor is used to make the robot move automatically following a specific path.
- Sound sensor is used to know the sound in the particular area.
- IOT is used to send the capture image to the person.
- Connect USB camera with raspberrypi
- Connect power supply for Raspberrypi
- Plug the HDMI cable in Raspberrypi from the monitor using VGA to HDMI converter cable
- Connect USB Mouse and USB keyboard to the Raspberrypi

4. NIGHT VISION CAMERA

IR or night vision cameras use infrared light to illuminate images in the dark. We can't see it, but infrared light is actually all around us. IR cameras detect these invisible infrared wavelengths, enabling the camera to see in the dark. There are different types of night vision currently used and available within the market. These are

not generation differences but technological differences such as digital and analog. Most security cameras are using a digital system, as this is comprised of an internalized chip and sensor. These digital systems can operate in both day and night, as there is no risk in damaging internalized components due to light exposure.



FIGURE 2: NIGHT VISION CAMERA

SOUND SENSOR

The sound sensor is one type of module used to notice the sound. Generally, this module is used to detect the intensity of sound. The applications of this module mainly include switch, security, as well as monitoring. The accuracy of this sensor can be changed for the ease of usage. This sensor employs a

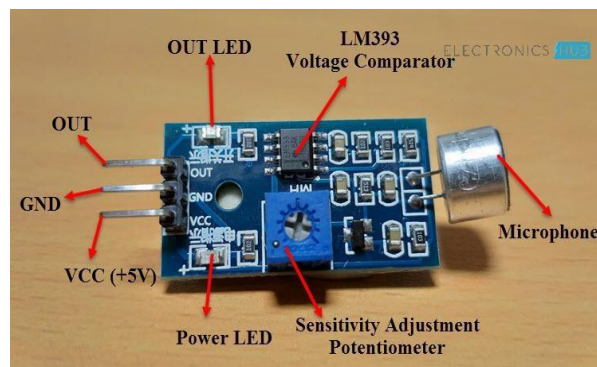


FIGURE 3: PIN CONFIGURATION OF SOUND SENSOR

microphone to provide input to buffer, peak detect or and an amplifier. This sensor notices a sound, & processes an o/p voltage signal to a microcontroller. After that, it executes required processing. This sensor is capable to determine noise levels within DB's or decibels at 3 kHz 6 kHz frequencies approximately wherever the human ear is sensitive. In smart phones, there is an android application namely decibel meter used to measure the sound level.

5. CONCLUSION

In this paper we implement a smart surveillance rover for military application with the help of this rover we know the real time condition of border area without using a any human source. The Night patrolling robot gives us live streaming video according to that we give the command. This system is capable of recording/capturing video/image.



REFERENCES

- [1] Design and Implementation of e-Surveillance Robot for Video Monitoring and Living Body Detection by Dr. Shantanu K. Dixit, Mr. S. B. Dhayagonde International Journal of Scientific and Research Publications, Volume 4, Issue 4, April 2014.
- [2] Smart Surveillance Monitoring System Using Raspberry PI and PIR Sensor by Sanjana Prasad, P. Mahalakshmi, A. John Clement Sunder, R. Swathi International Journal of Computer Science and Information Technologies, Vol. 5(6) 2014.
- [3] Sharma, Rupam Kumar, et al. "Android interface-based GSM home security system." Issues and Challenges in Intelligent Computing Techniques (ICICT), 2014N International Conference on. IEEE, 2014.