NIGHT VISION PATROLLING ROBOT

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ABSTRACT

This paper we suggest a robot patrolling security that uses night vision camera to protect any premises. The robotic vehicle is traveling at different intervals and is fitted with camera and sound sensors for the night vision. It uses a predefined line to patrol along its route. It stops at different points and if sound is heard it travels to next points. To patrol the allocated field, system uses the following IR-based path system. It monitors every area using 360degree rotating HD 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. This is where we use IOT Local Area Network (LAN) to receive transmitted images and display them with warning sounds to the user. We are therefore proposing a fully autonomous security robot that works constantly and patrols wide areas alone to protect the facility**.**

INTRODUCTION

The idea behind that is to protect the region as a whole. Any small sound resulting in sending the notification through the Blynk robot to the person concerned consists of the night vision camera from which we can see the live video through the smartphone send and capture the area and send it to the user.

Night vision camera plays a significant role in rendering the robotic device automatic. Robotics is a modern technology which is changing human life, as the key and emerging component of robotics is control and automation.

Robots function as a computer, and can be controlled remotely. Patrolling is nothing more than keeping track of an area where the corresponding robot patrolling area is constantly moving and traveling is continuously moving in the area allocating to the robot.

The robot takes the pictures at 360 degree rotation. Then, these images are sent to the user in real time, they will be evaluated by the user and action will be taken if any problems are found.

Using camera motor we may gather knowledge from both sides of the external field. We can control the robot in two ways: one wired, and the other wireless. Wireless monitoring helps us operate robot from various locations. GSM is used within this module and MCU is used for camera support node.

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, Raspberry Pi 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. In patrolling it uses a predefined line to follow its direction. Once sound is rotating HD camera to detect any intrusion. It has the capability of tracking sound at the premises.

Any sound after company is closed and its predefined direction starts to travel towards the sound. It then scans the region using its camera to detect any known human faces. It captures and starts to relay photographs of the situation immediately upon identification of sound or human face.

Here we use IOT gecko to get transmitted images and view them with warning sounds to the user. So we're putting forward a fully autonomous security robot that runs relentlessly and patrols wide areas alone to protect the building. Robot patrolling is primarily used in the military zone, hospitals, shopping mall, national functions, industrial field, etc.

LITERATURE SURVEY

Therefore there is a need to develop a device that can detect the operation in this area and send the inspection device nearby a message. Within this framework, they render a spy robot using Raspbian operating system with remote monitoring and control algorithm.

The spy robot system is connected to three types of equipment including a Arduino board, a camera and a night vision sensor. The information collected about the activities that operate on the front of the camera is sent to users via the web server which can be posted simultaneously on the web page. Cheng Tang, Qunqun Xie, Guolai Jiang, Yongsheng Ou, do a night out on the road based on a planar reflection model in 2013. It has given diverse road detection ideas and different monitoring concepts.

Road and street surveillance is also very important to conduct various activities such as identification of pedestrians, any suspicious behaviour, etc. This system grades the pixels of the route image. Various projects are planned for daytime activities so far but no such work is done for night. This technology centers the identification for any insufficient night-time practices. As this device is based on vision and can discern the path according to the view, when some other thing, as for birds or car, get inside the photo it will face difficulty. Here a planar reflection model is practical with an infrared camera to distribution of the strength of the different pixels.

For that, a classification based on pixels is used to test whether or not the various pixels belong to the lane. If it only decides the surface of the road then the further cycle starts.

In 2017, he made night rider Kirk Mac Tavish, Timothy D. Barfoot and Michael Paton: visual odometry with headlights. This technique measures relative transfer for mobile robotic systems with a series of camera images. A camera can be used to get vast quantities of input data, which are comparatively cheap sensors, making it highly costly functional captures in mobile robots. As this is a passive part, however, it will be dependent on external strength, which can decrease its accessibility.

We may use some of the other services outlets for lighting purposes as for headlights. With this can use headlamps as an alternative light source; the paper examines the VO stereo outdoor output with the lighting conditions for mainly 10 kms of 30 hour travel area. The scope of visibility, a complex source of light, speed highlights etc. are among these different challenges.

SURVEY TABLE

Author	Paper Title	Advantages	Disadvantages	Existing System
M.Bertozzi	Low-level Pedestrian Detection by means of Visible and Infra-red Tetravision	Far infra-red cameras are suitable for the detection of objects warmer (or colder) than the background (pedestrians, moving vehicles,. . .), since they are sufficiently contrasted with respect to the background	The detection of pedestrians in the visible domain is often more difficult due to the presence of small details, shadows, and changes in the luminance or sharpness of acquired images due to different illumination conditions.	In this paper a tetra-vision system aimed at the detection of pedestrians using two infrared and daylight stereo systems has been diiscussed
Brozzi	Model-based validation approaches and matching techniques for automotive vision based pedestrian detection	Lot of information is contained in the borders of the framed pedestrian, thus a model that takes in great account this feature, coupled with an appropriate matching function is better than a plain correlation on pixel values. The usage of model	frequency usage, but the set needs to be very large and thus time consuming and not suitable for real-time applications.	In this paper several techniques and approaches to human models suitable to be used in the validation phase of a real

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Andrew Howard	Laser-Based People Tracking.	Tracking algorithm is computationally light-weight; it works in real time on an IBM 600e Think-pad with 64MB RAM and a 300MHz P-II processor with 2 lasers and up to 10 objects.	Using lasers has its drawbacks. Lasers are oblivious to objects outside their plane of scan, thus making it difficult to perceive details of activity.	In this paper we have introduced a novel laserbased tracking approach. Our method exploits the advantages of lasers while overcoming some of shortcomings vision processing requirements.
Harsh Nanda & Larry Davis	Probabilistic Template Based Pedestrian Detection in Infrared Videos.	The implementation that we have developed is quite fast and with some optimizations depending on the hardware on which it will finally be used, it will be fast enough for most practical applications.	Many of the false alarms are due to lamp posts hanging high in the sky. Such false alarms that occur due to objects hanging from the sky or lying flat on earth should be easy to remove using the prior probability of occurance of pedestrians in the scene.	In this paper we have presented a method robustly detecting pedestrians infrared videos taken from moving platforms. A simple yet effective idea of probabilistic has been introduced and used for pedestrian detection in cluttered backgrounds.
David Beymer & Kurt Konolige	Real-Time Tracking of Multiple People Using Continuous Detection	emphasize tracking in the face of background clutter and partial occlusion.	the most important remaining tracking issue is that of redetection when a person is temporarily occluded	Real-time stereo provides extended information for 3D detection and tracking, even in the presence of crowded scenes, obscuring objects andlarge scale changes.

METHODOLOGY

In this proposed device, Node MCU is equipped with the night vision camera that helps the user to go for automation and helps to find the person or any problem detected using the sound sensor and automatically goes to that area and captures the image and sends it to the user using IOT technology according to the sound generated. The robot has a range of knowledge to protect the greater region. This robot uses two infrared sensors that are capable of detecting obstacles robot on both hands. When the barrier does is at the front of the robot it changes its direction to the opposite side of it.

In the robotic world, Microphone is used to detect sounds in the real time and send them to the monitoring system. The live photos and videos are recorded by the vision system. Two generators are enough to power the module for robot movement. Because the number of gears in the motor is small, less power consumption will be received. This robot will be moving front and backwards using infrared sensors with the help of wheels with the use of Dc engine. Dc engine transforms electrical power into mechanical power. This motor consists of 60 torque, this torque helps to move the wheels. Here a 12volt battery is used to supply the power to the MCU-node. Where the MCU node is used to connect to the Wi-Fi. After connecting to the Wi-Fi the captured pictured and will be visible in the operators mobile. Where the operator can turn the camera 360 degrees to check out the whole street.

There is a sound sensor using in the robot. This sound sensor will sense the sound with the particular frequency and after sensing the sound the robot will move towards the sound recognized side and the camera will be switched on and the camera will record the video with the audio file. This video and the audio file will be monitored by the operator who is having with robot.

FLOW CHART
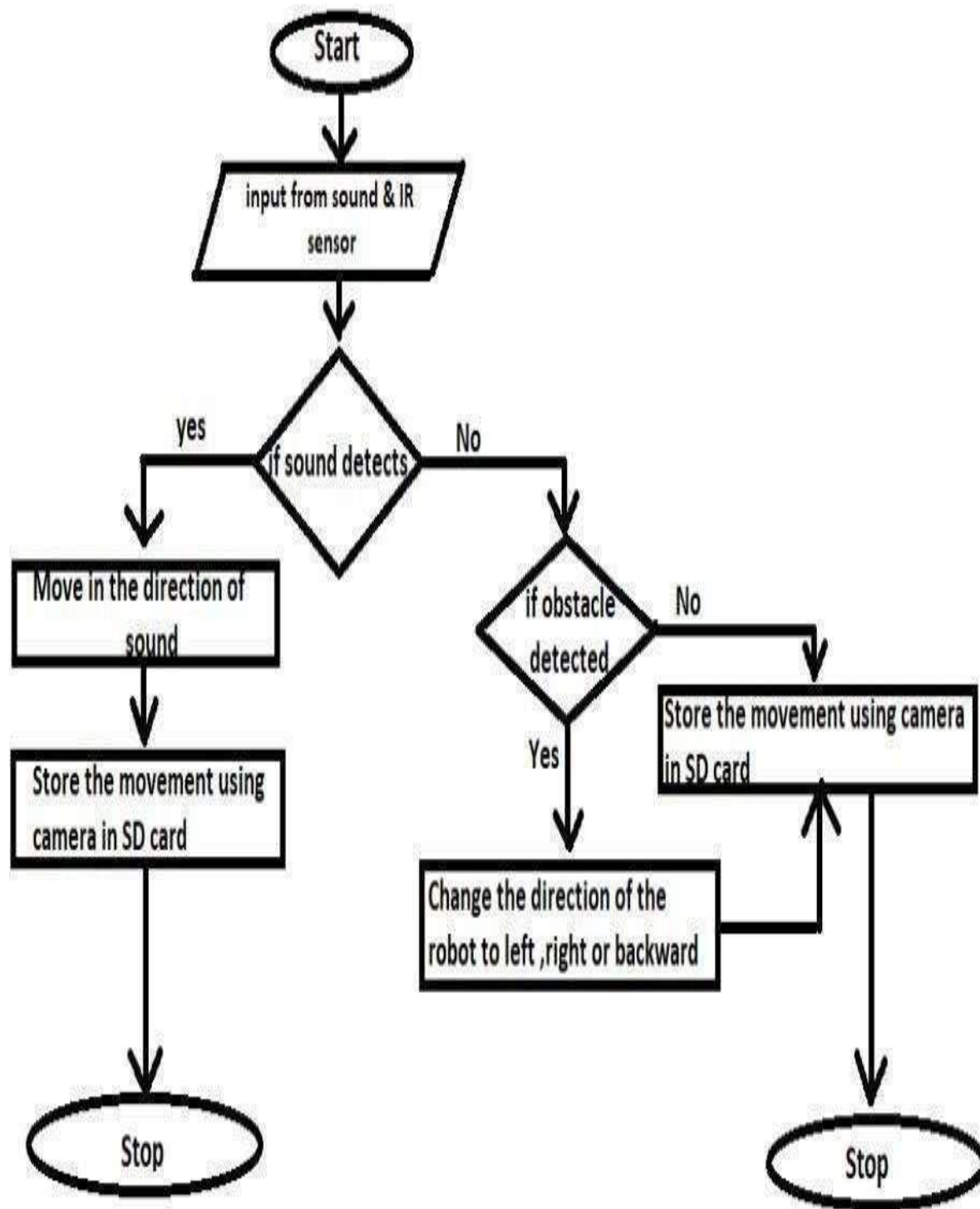
BLOCK DIAGRAM
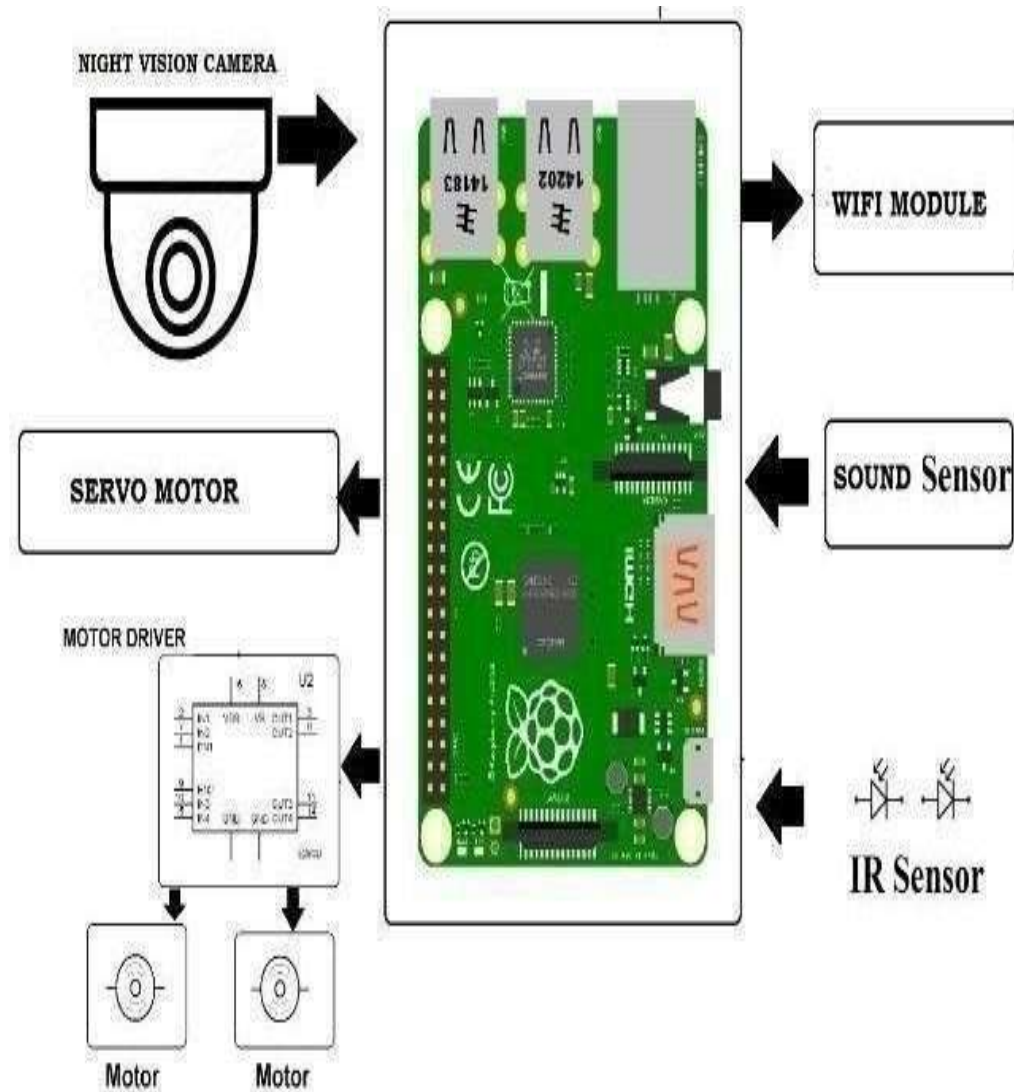
HARDWARE REQUIREMENTS

Node MCU

Node MCU- ESP8266 is free Wi-Fi microcontroller. It is a forum for open source IOT.

This tiny board enables microcontrollers to attach to the Wi-Fi and uses Hayes style commands to make easy TCP / IP connections. MCU Node refers to the firmware by default.

- This firmware uses Lua as a scripting language.

Night vision camera

Night visibility: 8 PCS LEDs for IR illumination. Vision extends up to 8 meters at night. Input/Output: Mic&Speaker built-in. Supports bidirectional audio, simple contact.

Infrared sensor

An electronic infrared sensor system that problems certain elements of the atmosphere to be sensed. An IR sensor can calculate the heat of a given object and can also detect the motion. Such sensors forms monitor only for infrared radiation, rather than the so called passive IR sensor emitting it.

Sound sensor

One type of module is used to detect the sound is a sound sensor. This module is usually used for measuring the sound strength. This system uses a microphone to provide buffer data, peak detector, and an amplifier. This sensor detects a vibration and processes a microcontroller's voltage signal to o/p.

- Dc engine
- SD card
- Jumper Cables

SOFTWARE SPECIFICATION

Arduino IDE

The Arduino Integrated Programming Environment (IDE) is a cross-platform system written in functions like C and C++ (for Windows, macOS, Linux, etc.). It is used to write and upload programs to boards which are compatible with Arduino but also other product development boards with 3rd party core support.

Embedded C

Embedded C is a generic term given to a C-written programming language associated with a particular architecture of the hardware; Embedded C is a C

language extension with many additional header details. These files in the header could turn from controller to controller.

Blynk Android program

Blynk was built for the Internet of Things. It can track equipment remotely, display data from the sensor, store data, visualize it and do many other cool things. Blynk Software-enables you to create awesome interfaces for your projects using the different widgets we deliver.

- Blynk Server, responsible for both mobile communications and hardware. You can use our Blynk Cloud, or you can run your Blynk server locally. Its open source can easily fit thousands of devices and can even be mounted on an Aurdino.
- Blynk Libraries allow all popular hardware platforms to communicate with the server, and process all incoming and outgoing commands.
- Features
- Compliant API & UI for all hardware and software supported;
- Use Cloud storage.
- WLAN
- Bluetooth and BLE
- Ethernet
- USB (Serial)
- GSM
- Collection of easy-to-use Widgets
- Direct pin manipulation without code writing
- Simple to install and attach new features using virtual pins
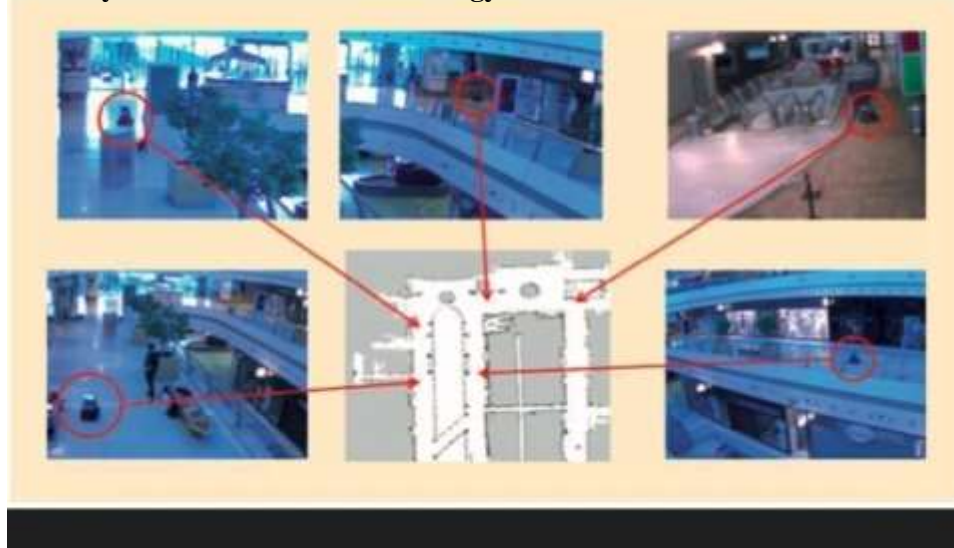- Background data monitoring through Super Map.

RESULT

This is a picture captured the road with the night vision camera

This a picture captured the streets in the night with the night vision camera

This is a picture captured in a room with the night vision camera

The night vision robots can be used in public places also like shopping malls to bring out the best surveillance.

CONCLUSION

The paper ends with a definition of patrolling safety robot, which uses night vision camera to secure its premises. The robot runs in the same direction, at different intervals. It also features a camera with night vision and sound sensors. It is employed by a predefined route to patrolling movement given by the controller. It collects and sends out the pictures directly to the show room for further action.

According to this device, the whole area monitoring is conducted using the night vision camera and even automated system when the sound is detected by the robot will automatically send the notification that it can capture the live video of the area where the data can be stored or the video can be live streaming, because the camera used is a night vision camera, the security system can benefit from streaming Video using IOT and sending the message is via Wi-Fi from the blynk server. This machine is an automated intelligent way to patrol night vision.

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