Night Patrolling Device

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ABSTRACT

At present the observation during night clad to be exceptionally testing task. There are some spots where people cannot be engaged with watching [1]. A fundamental prerequisite of this circumstance could be a robot which consequently identifies trespassers within the territory like workplaces, home, building so forth and report handy board security control unit. In the current work, A late evening guarding robot is formed with upgraded capacity to recognize and alarm if there's any human movement within the territory to present exact observing framework [2]. The Night Patrolling Robotic vehicle moves during a random path while watching. The framework utilizes IR based way following framework for watching allocated zone. The development of a robot is additionally controlled consequently through deterrent recognizing sensors to remain far from the crash. It screens every zone to acknowledge any Interruption utilizing camera which is mounted on the highest of the robot to catch the images, record and sends them to the client. It can likewise impart the continued video signs to the client [3]. The principle goal of this undertaking is to acknowledge the dubious exercises within the regions where human presence cannot be seen.

Keywords : Arduino, Surveillance, ESP32, IoT, Robot, Security, Microcontroller, Embedded frameworks.

I. INTRODUCTION

Technology has presented to us a dynamic and colossal change in apply autonomy and Robotics field which runs in a wide range of regions. Reconnaissance is the procedure of close precise perception or oversight kept up over an individual, gathering, and so forth particularly one in authority or under doubt. In this way reconnaissance is primarily required in the zones, for example, outskirt zones, open spots, workplaces and in enterprises. It is for the most part utilized for checking exercises. The demonstration of observation can be performed both indoor just as in open air territories by people or with the assistance of installed frameworks, for example, robots and other mechanization gadgets. A robot is

only a programmed electronic machine that is equipped for performing customized exercises in this way supplanting human work, giving profoundly precise outcomes and beating the constraints of people. In this way supplanting people in the reconnaissance fields is one of the extraordinary progressions in mechanical autonomy.

Patrolling is nothing but to keep monitoring over an area by regularly moving or travelling a route of the corresponding area. The robot captures the images with the help of camera. These images are then sent to the user in a real time, user will analyses it and if there is any problem observed then alarm is triggered manually. Robot patrolling is mostly used in Military area, Hospitals, Shopping mall, Restricted Zones, Industrial area, Agricultural area etc. The robot uses ESP32 based camera sensor which cuts down the price of using a raspberry pi. This also reduces the instructions and enables programming the robot with a least programmable skills.

II. METHODS AND MATERIAL

A] Vehicle Assembly:

- The vehicle consists of 4 dc motor connected to a motor driver to perform linear motion.
- The vehicle is powered by 12volts Lithium ion battery.
- The vehicle is operated by user through Blink server.
- The vehicle can also be controlled by wired transmitter.

B] System Assembly and Working:

- Our system consists of following sensors such as, Temperature sensor, Gas sensor, Camera module, Sound sensor and ultrasonic sensor, etc.
- Above mentioned sensors are interfaced with ESP 8266(Node MCU) module.

- The above mentioned sensors coverts stimuli such as heat, light, sound and motion into electrical signals.
- These signals are passed through ESP 8266 module that converts them into a binary code and passes to Blynk server to be processed.
- The temperature sensor is connected to motor driver, which gives an alert (notification) above critical temperature .
- If the heat is detected by a gas sensor then the notification will be displayed.
- Camera module will survey the surroundings environment and capture images and videos which later been processed by a server.
- Sound sensor is used to capture the audio from nearby.
- Ultrasonic sensor is used to detect the object detection.
- The data which has been fetched from the sensors will later has been processed simultaneously and will give corresponding output.
- The real-time data is being graphically visualized on Blynk server.
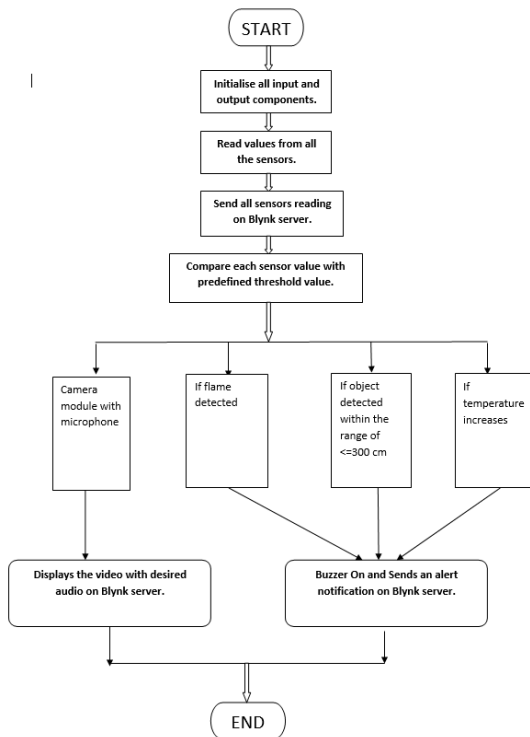- All the code and algorithm of the system is executed on Arduino IDE.

Fig.1 Flow Chart

III. SYSTEM ARCHITECTURE

In proposed paper we are collecting all parameters with the help of sensors. The system comprises all components in Night Patrolling Device system as shown in Fig. 2.
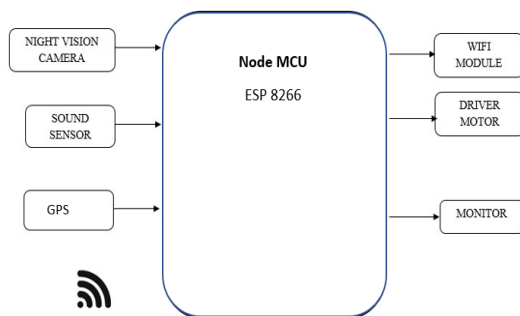

Fig.2 Block Diagram Project

3.1 Hardware

- ESP8266 Node MCU
- GPS Module
- Camera Relay Module
- Motor Driver

- Sound Sensor
- Ultrasonic Sensor
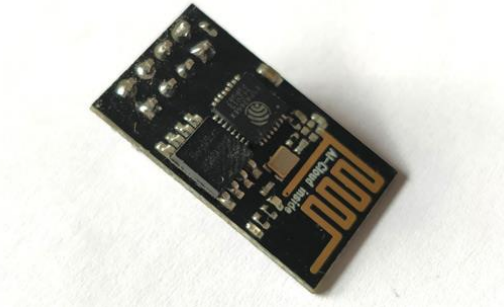- LM-35 Temperature Sensor

ESP8266 Wifi Module

Fig.4. ESP8266 Wifi Module

The ESP8266 is a very user friendly and low cost device to provide internet connectivity to your projects. The module can work both as a Access point (can create hotspot) and as a station (can connect to Wi-Fi), hence it can easily fetch data and upload it to the internet making Internet of Things as easy as possible. It can also fetch data from internet using API's hence your project could access any information that is available in the internet, thus making it smarter. Another exciting feature of this module is that it can be programmed using the Arduino IDE which makes it a lot more user friendly. However this version of the module has only 2 GPIO pins (you can hack it to use upto 4) so you have to use it along with another microcontroller like Arduino, else you can look onto the more standalone ESP-12 or ESP-32 versions. So if you are looking for a module to get started with IOT or to provide internet connectivity to your project then this module is the right choice for you [2].
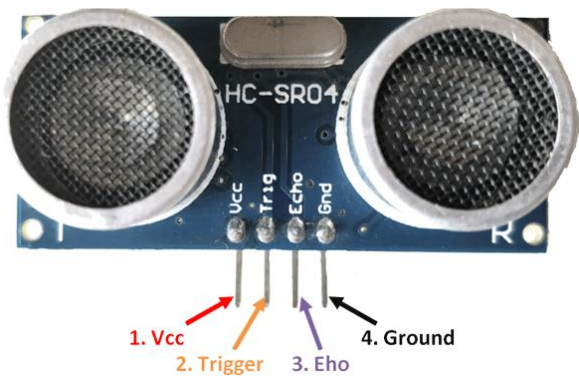
Ultrasonic Sensor

Fig.5. Ultrasonic Sensor

The HC-SR04 ultrasonic sensor includes a transmitter & a receiver. This sensor is used to find out the distance from the objective. Here the amount of time taken to transmit and receive the waves will decide the distance between the sensor and an object. This sensor uses sound waves by using non-contact technology.

- Operating voltage: +5V
- Theoretical Measuring Distance: 2cm to 450cm
- Practical Measuring Distance: 2cm to 80cm
- Accuracy: 3mm
- Measuring angle covered: <15°
- Operating Current: <15mA
- Operating Frequency: 40Hz
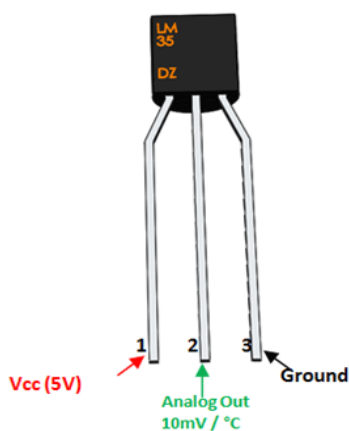
LM-35 Temperature Sensor

Fig.6. LM-35 Temperature Sensor

LM35 is a precession Integrated circuit Temperature sensor, whose output voltage varies, based on the temperature around it. It is a small and cheap IC which can be used to measure temperature anywhere between -55°C to 150°C. It can easily be interfaced with any Microcontroller that has ADC function or any development platform like Arduino[4].

- Minimum and Maximum Input Voltage is 35V and -2V respectively. Typically 5V.
- Can measure temperature ranging from -55°C to 150°C
- Output voltage is directly proportional (Linear) to temperature (i.e.) there will be a rise of 10mV (0.01V) for every 1°C rise in temperature.
- ±0.5°C Accuracy
- Drain current is less than 60uA
- Low cost temperature sensor
- Small and hence suitable for remote applications
- Available in TO-92, TO-220, TO-CAN and SOIC package

ESP-32 cam Module

Fig.6. ESP32 Cam Module

The ESP32-CAM is a development board with an ESP32-S chip, an OV2640 camera, microSD card slot and several GPIOs to connect peripherals. In this guide, we'll take a look at the ESP32-CAM

GPIOs and how to use them. The ESP32-CAM comes with three GND pins (colored in black color) and two power pins (colored with red color): 3.3V and 5V.You can power the ESP32-CAM through the 3.3V or 5V pins. However, many people reported errors when powering the ESP32-CAM with 3.3V, so we always advise to power the ESP32-CAM through the 5V pin.

IV. RESULTS

Here we implemented Camera and different sensors to monitor real time condition of the area. Sensors and microcontroller base processing unit for collection of different parameters such as External weather condition, environmental temperature and and real time video streaming for monitoring. So that we can use this Night patrolling Device for security of any society area, college campus, Hospital Areas and Many More.

V. CONCLUSION

From this project we can keep monitoring over an area by regularly moving or travelling a route of the corresponding area. The robot captures the images with the help of camera. These images are then sent to the user in a real time, user will analyses it and if there is any problem observed then alarm is triggered manually. Robot patrolling is mostly used in Military area, Hospitals, Shopping mall, Restricted Zones, Industrial area, Agricultural area etc. The robot uses ESP32 based camera sensor which cuts down the price of using a raspberry pi. This also reduces the instructions and enables programming the robot with a least programmable skills.

VI. REFERENCES

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