

Spy Cam with Automatic Door Control

M. Siva Kumar¹, B. Vishnu Sreedhar², P. Suresh³, K. Selvika⁴, A. Ranjitha⁵

¹Assistant Professor, Dept. of Computer Science and Engg., Sri Eshwar College of Engg., Coimbatore, India

^{2,3,4,5}Student, Dept. of Computer Science and Engg., Sri Eshwar College of Engg., Coimbatore, India

Abstract: Internet of Things is fast becoming a disruptive technology. This project aims at building a smart wireless home security system using Wi-Fi as communication protocol. The Home Automation can be implemented using different types of wireless communication techniques such as Zig-Bee, Wi-Fi, Bluetooth, etc. These existing methods have drawbacks as they work in short range. To overcome these drawbacks, we are going to implement this project IOT based Spy Cam with Automatic Door Control. The project focuses on door unlock system referred as Home Automation and providing Smart security. By using Node MCU Module we are going to implement this project. This will be more helpful for Handicapped and aged people.

Keywords: spy cam, automatic door control

1. Introduction

Home automation refers to handling and controlling of home appliance by using some computer technology or micro-controller. Making everything automated is currently trending topic in a society, because it provides us ease, security and more efficient to work with it. In this system a sensor senses the current status through the spy cam, and it updates every status to web server. It is very helpful for the user who is far away from their home, he/she can access and change their status of appliance i.e. it switches it on/off. User can use local PC. This paper will describe the approach of controlling home appliance by using web server and it also implements the concept of smart security system. Owners account is low or if the vehicle is not equipped with an RF system, the tollgate remains close.

2. Literature survey

A. IoT based Smart Home Security System with Alert and Door Access Control using Smart Phone

The system is about to the remotely managed Door accessibility and voice alerting through Smart Phone and receive captured image of visitor at Door as Email alert. Smart home security control system has become indispensable in day today life. The design and development of a home security system, based on human motion detection and remotely monitoring technology, to confirm visitor identity and to control Door accessibility has been reported in this paper. This paper describes about implementation and deployment of wireless control system and accessibility in to a home environment for authenticated people only.

A PIR motion sensor and Camera module are used to detect

motion and capture images are delicately made the security system alive as per the request. Electromagnetic door lock module operates the door accessibility, has been designed and deployed. This system uses controller interface system with Raspberry Pi which is low cost and consume smaller amount of power. When visitor motion detected by Camera module interfaced to Raspberry Pi capture images, save it on system and send it as Email alert via TCP/IP. The concerned authority can control the system and view live video stream of camera module through Smart Mobile Phone. The system also provided concerned authority to use Smart Phone to send command for voice alert when intruder identified. User can monitor visitors and control the door lock on active SSH (Secure Shell) page designed on android platform and enhanced with JavaScript. The entire control system is built using ARM1176JZF-S micro controller and tested for actual use in home environment.

B. IoT based Facial Recognition Door Access Control Home Security System

This paper deals with the idea of secure locking automation utilizing IoT for door unlocking system to provide essential security to our homes and related control operations and security caution through the GSM module. It uses an image capturing technique in an embedded system based on raspberry pi server system. Raspberry-pi controls the camera for catching it for turning on a relay for door unlocking. The module contains a sensor for motion detection and automatic door unlocking. The camera catches the facial picture and compares it with the image which is already stored in the database. If the picture is found in the database, then the door lock opens otherwise it will produce an SMS that an unknown person is trying to gain access.

C. Home Security System and Door Access Control Based on Face Recognition

Smart security system has become indispensable in modern life. The proposed security system has been developed to prevent robbery in areas like home environment with lesser power consumption and more reliable standalone security device for both Intruder detection and for door security. The door access control is implemented by using face recognition technology which grants access to an only authorized people to enter into home. The face recognition and detection process is implemented by principal component analysis (PCA) approach and instead of using sensor devices intruder detection is

achieved by performing image processing on captured video frames of data, and calculating the difference between the previously captured frame with the running frames regarding pixels in the captured frames. This is the standalone security device has been developed by using Raspberry Pi electronic development board and operated on Battery power supply, wireless internet connectivity by using USB modem. Auto Police e-Complaint registration has been achieved by sending security breach alert messages to nearby police station e-mail id. This proposed is more effective and reliable this system consumes few data and power compared to the other existing systems.

3. Methodology

The proposed system provides a base for the System depends on the utilization's discretion associate degree decide ability of things (whether it's a guest or an unwelcome person getting into his house) the use of a camera connected to the micro controller might help the user in making decisions on whether to activate the security system or welcome the guest. The captured image of the guest or unwelcome person when faces detection, can be mailed to the user. Future, System may be made more synchronized by integrating the voice call feature within the same Smartphone application through which the user can even control his home appliances.

4. Implementation setup

Components required:

- Arduino Nano
- Motor Driver
- Node MCU

A. Arduino Nano

The Arduino Nano is similar to the Arduino UNO. They use the same Processor and hence they both can share the same program. One big difference between both is the size UNO is twice as big as Nano and hence occupies more space on your project. Also, Nano is breadboard friendly while Uno is not. To program an Uno you need Regular USB cable whereas for Nano you will need a mini USB cable.

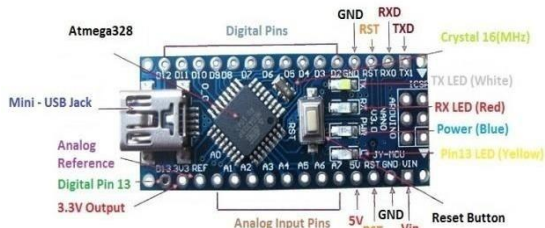


Fig. 1. Arduino Nano

B. Motor Driver

Motor driver act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors. L293D

contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction. The motor operations of two motors can be controlled by the average logic on pins 2 & 7 and 10 & 15. Input logic 00 or 11 will stop t corresponding motor. Logic 01 and 10 will rotate in clockwise and also anticlockwise directions, respectively. Enable pins 1 and 9 (corresponding to the two motors) must be high for motors to start operation. When the enabled input is high, the associated driver gets enabled. As a result, the outputs become more active and work in phase with their inputs. Similarly, when the enabled input is low, that driver is disabled, and their outputs are off and in the high-impedance state.

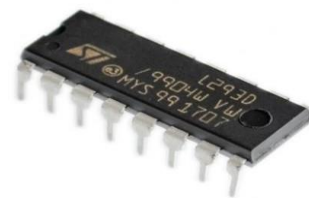


Fig. 2. Motor Driver

C. Node MCU

Node MCU is an open source IOT platform. It includes firmware which runs on the ESP8266 Wi-Fi SOC from Expressive Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the development kits.

The firmware's uses the Luascripting language. It is based on the eLua project, and built on the Expressive Non-OS SDK for ESP8266. It uses many open source project, such as luacjson SPIFFS.

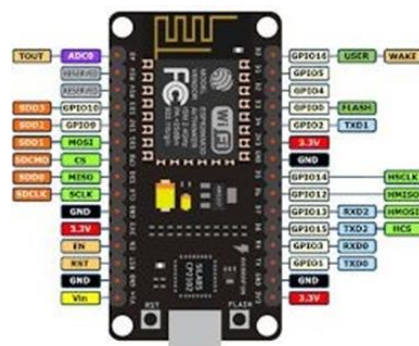


Fig. 3. Node MCU

1) DC Motor

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. All types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow. DC's motors were the first type widely used, since they could be powered

from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field winding. Small DC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight brushed motor used for portable power tools and appliances. The onset of power electronics has made replacement of DC motors with AC motors possible in many applications.

2) IR Sensor

An infrared sensor circuit is one of the basic and popular sensor module in an electronic device. This sensor is analogous to human's visionary senses, which can be used to detect impediment, and it is one of the common applications in real time.



Fig. 4. IR sensor

5. Proposed system

The proposed system is implemented using Node MCU by overcoming all the drawbacks of previous existing methods. It is also used to detect unknown persons which are the additional advantage of this proposed system Lives Steaming is implemented.

The planned system intimates concerning the presence of any individual within the premises, conjointly providing additional security by recording the activity of that person. While deeded the premises, user activates the system by coming into secret. System operating starts with detection of motion purification to human detection followed by numeration human within the space and human presence conjointly gets notified to neighbor by turning on alarm. In addition, notification about the same is send to user through SMS and e-mail. The planned system's hardware implementation is supported by Arduino board; on the alternative hand, code is given by OpenCV (for video surveillance) and GSM module (for SMS alert and e-mail notification). Apart from security facet, system is intelligent enough to optimize power consumption wastage if user forgets to change off any electronic appliances by customizing writing with specific appliances.

6. Project outcome

This is the code for the IR webcam. This uses the arduino board. Arduino boards are able to read analog or digital input signals from different sensors and turn it into an output such as activating a motor, turning LED on/off, connect to the cloud and many other actions. You can control your board functions by sending a set of instructions to the microcontroller on the board via Arduino IDE (referred to as uploading software).

Unlike most previous programmable circuit boards, Arduino does not need an extra piece of hardware (called a programmer) in order to load a new code onto the board. You can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks the functions of the micro-controller into a more accessible package.

```

Sketch: mar21d | Arduino IDE | Hourly Build 2019/03/18 11:35
File Edit Sketch Tools Help

sketch_mar21d$

const char* ssid = "pottas";
const char* password = "122334444";
int LED1=5;
int LED2=14;
int sensor=4;
WiFiServer server(80);
void setup()
{
  Serial.begin(115200);
  pinMode(sensor, INPUT);
  pinMode(LED1, OUTPUT);
  pinMode(LED2, OUTPUT);

  Serial.println();
  Serial.println();
  Serial.print("Connecting to ");
  Serial.println(ssid);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi is connected");
  server.begin();
  Serial.println("Server started");
  Serial.println(WiFi.localIP());
}
void loop()
{
  int sensorState=digitalRead(sensor);
  if(sensorState==LOW)
  {
    WiFiClient client = server.available();
  }
}

```

Fig. 5. Code for IR Cam

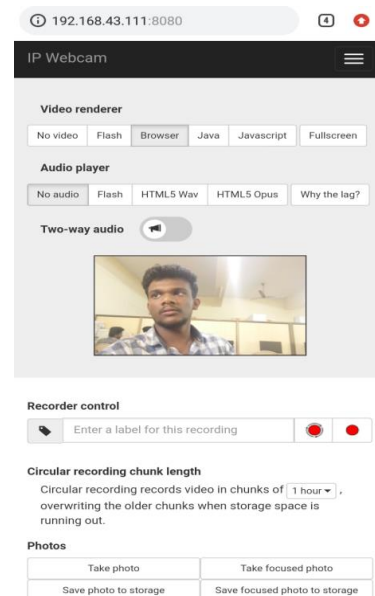


Fig. 6. Screenshot of IP Webcam

The above screenshot is the output of the project. The sensor in the camera senses the person behind the door and gives a notification to the owners mobile. If the person is known to the owner, the owner can open the door using the application in the mobile. The sensor also helps to record a video or take a snap of the person. This photo or video helps in time when an

unauthorized person tries to enter the home.



Fig. 7. Output in mobile

The above picture is the final output that is displayed in the mobile. The owner can press motor on button to open the door.

7. Conclusion

The home automation using IOT has been experimentally proven to work satisfactorily by connecting simple appliances to it and the appliances were successfully controlled remotely through internet. The designed system not only monitors the sensor data, but also actuates a process accords to the

requirement, for example switching on the light when it gets dark. It also stores the sensor parameters in the cloud in a timely manner. This will help the user to analyze the condition of various parameters in the home anytime anywhere.

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