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IoT and AI based Home Automation System

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Abstract: **Technology is growling with internet of things IoT and artificial intelligence is that the backbone of such revolutionary engines. Basically within the universe the things having sensor capability decent power offer and connectivity to internet makes field like internet of things iot possible. for such fast growing technology it's the requirement to have very light cheap and minimum information measure protocol like message queuing telemetry transport MQTT because of such non established protocol it's straightforward for the clients to publish or and subscribe the desire topic through the host acting as server of the network conjointly better known to be the broker. in this project it's shown that communication between the low power ESP8266E local area network as client with the clients on smartphones and laptop computer using an mqtt protocol becomes easier and additional reliable. The Wi-Fi enabled nodemcu board interfaces with DHT11 sensor device and light sensor to observe the ambient condition and in line with the light intensity is controlled. The adafruit.io and thingspeak is that the mqtt server i. e broker that conjointly provides the ability of monitoring system through the adafruit dashboard.**

Keywords: **IoT, MQTT, ESP8266E, ESP8266E, DHT11**

1. Introduction

Home automation is commonly called smart home it involves the control and handle the things like light fan door alarming for certain remainders security purposes all the things are connected to the internet and all of them can accessed at any place and any time. Most popular protocol communication for the products includes x10 Ethernet zigbee and z wave or other protocols are all incompatible with other. The web server is simultaneously updated by sensing the status of the things which are connected to the network. The status of the appliances is controlled by the switch it either on or the computer technology. It also provides the security energy efficient and ease of use hence it is adopted more. It also helps by providing to control and monitoring on web browser. The main objective of the project is to help handicapped people and aged people by alerting in the critical situations. All the devices can be used in our own sitting place itself. The problem overcome by this paper is about that home automation is generally implemented by using Bluetooth through our pc. Pin check algorithm is used to implement this set up by using the cable network other than the wireless communication. The device esp8266 which is the embedded device used to access the cloud. The home automation using Bluetooth with the help of pc has implemented by researcher. The range is limited by using the bluetooth device. The devices are controlled by the telephone and with pic controlling remote device by hasan. The iot devices uses different types of protocol. Mqtt message queuing telemetry transport is one of the useful and advance. We can also use pir sensor and proximity. Where the devices in iot is used for controlling or nominating the devices where all of them are far away from this. Mqtt and tcp protocols are also used to implement the esp8266 Wi-Fi module. Applications command control and routing process and security of the node and all the iot devices include various objects like personal computer smart phones tablets which gives the communication between the things and people and also the to reduce the need for the home intervention we are used to control the home automation through the use of control systems esp8266 currently esp8266ex is a chip which is a highly integrated Wi-Fi soc solution where in the internet of things industry the users overcomes the efficient power usage efficiently design and performance also provides network able foundation of network able foundation for facilitating end the vendors repeatedly created the esp8266 chip at their cores include multitude of modules. As well as the olimex adafruit sparkfun wemos espert espresso all make various modules. Esp8266 can act either as the slave to a host mcu or as a stand alone application. When it acts as a host it promptly boots up from flash. Acts as a perfect chip for home automation field. In this paper we are going to use the adafruit huzzah esp8266 breakout which will be easy to use in the esp8266 breakout board and two components such as a sensor module we can able to control the small home automation system anywhere in the world through adafruit io. Home automation system in which model consist of different sensors like temperature gas motion and ldr. Initially the intel galileo connects to the internet through Wi-Fi. When the connection is established it will start reading the parameters of sensors like p1 p2 p3 etc. The data can be analyzed anywhere any time. If the sensor parameters are greater than the threshold level then the respective alarm a1 a2 a3 etc. If the temperature exceeds the threshold level then the cooler will turn on automatically and it will off when the temperature comes to control. The user can also monitor the electric appliances through the internet via web server. If the lights or any electrical appliances are left on in hurry can be seen and turned off remotely through simply typing the ip address of the web server. The internet of things iot is in a huge way and people are rapidly inventing new gadgets that enhances lives the user can

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2. Methodology

A. Hardware assembly

Esp8266 is an integrated tcp/ip protocol which helps any microcontroller having uart to access a wifi network. It can act as both wifi access point also wifi client. It is pre-programmed commands, so we can easily configure it using a microcontroller esp8266 runs on 3.3v and its input pins are not 5v tolerant. So, we need to reduce the 5v output of the tx pin to 3.3v by using resistors to connect to rx pin of esp8266 module. Arduino ttl input pins will connect 3.3v as logic high, so we can directly connect 3.3v output of esp8266 tx to relay rx pin. First, we can connect esp8266 with the 5v 4 channel relay. The esp8266 runs on 3.3v, it may damage if you connect it directly to 5v from dc Power Supply. The pin out of the ESP-01 ESP8266 module is shown above. Connect the VCC and CH_PD of the ESP8266 to the 3.3V output pin of 5V 4 Channel Relay. CH_PD is Chip Power Down pin, which is active low. Then connect the GND pin of the ESP8266 with the digital pin 2 of the Relay.Then make a voltage divider to make 3.3V for the RXD of the ESP8266 which is connected to the pin 3 of Relay Module. Here we are using software UART through digital pins 2 & 3 of Relay Module. Lastly, connect the ground of the ESP8266 with the ground of the Relay Module.Now we can connect relays to ESP8266E Connect Four relays of pins IN1, IN2, IN3. IN4 to D1, D2, D3, D4 of Wi- Fi ESP8266E Modules 12 and 13 of the. Also connect 5V and ground from the ESP8266E Modules to power the relay.
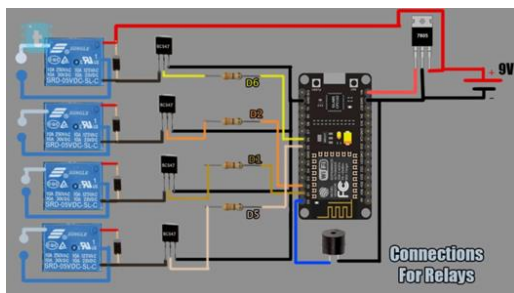

Fig. 1. Connections for relays

Connect the ESP8266 to a USB to TTL Serial adapter to enable you to program the ESP8266 using the Arduino IDE.
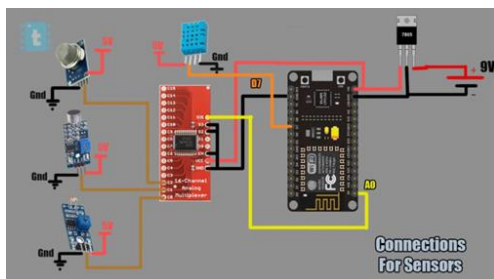

Fig. 2. Connections for Sensors

B. Uploading code

Build the circuit as per the above given diagram. Power up the board and wait till the esp8266e board boots up successful. It will take around 5 seconds connect the module reset pin to ground. Reset pin is grounded to bypass the circuit. To upload your program to the nodemcu: disconnect power to the nodemcu. Bring gpio0 to ground (press and hold down the push button).power up the esp. Release the push button click the round right arrow icon to upload the program if you have errors in communications, check your connections and that you have the serial port selected appropriately. Hopefully the right color wires from the serial cable are connected to the nodemcu module.
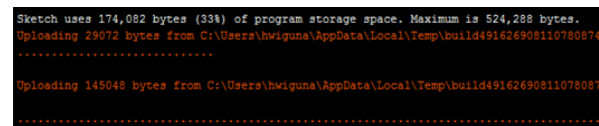

Fig. 3. Uploading Code to Arduino

C. Cretaing IFTTT applets

If This Then That.It is a web-based service where users create conditional statements known as Applets. It can be triggered under different conditions. This is a free service. You can create thousands of applets Visit officialsite of IFTTT and Login with your account after click on "Search" and type in Google Assistant. Select "Say a Simple Phrase" and click on it "Connect".then Fill the all to field to connect with including User Input like "Light On" and below that Assistant's Response. You should see something like above Figure.Now click on "Search" and type in adafruit. Select "Monitor a Feed on adafruit IO" and select from respective fields.after Fill in the details as we have filled in the above image. Here my task is to turn on my Lights (Relay 1) when I say "Turn on First Light". Then first light will be on by processing Google Assistant and adafruit Web Request.

Fig. 4. IFTTT Applet Creation

The system receives voice command from anyone. The Google Assistant Voice Application receives the sound wave as

a "String" through paired Wi-Fi Serial Modules and converts it into text. In the present-day home automation has becoming essential for the purpose of improving life style. It is also very helpful for the handicap to look after the home and easy to inform if there is any trouble in the house. Automation systems are installed carefully and are integrated under one centralized control unit which ultimately secures the people 6. Managing all of our home devices from one place. The convenience factor here is enormous.

3. Conclusion

It can be concluded that Home Automation System with ESP8266E was a success.This system consists Esp8266 Module configured with 4 Channel 5V Relay, 5V Power Supply Module, 16 Channel Analog Mux, Sound Sensor, Temperature and Humidity Sensor, LDR Light Sensor Module, Motion Sensor Detector, IFTT Server, Adafruit Web and Google's Assistant.. It is user friendly and it is cost effective.

References

[1] R. A. Ramlee, M. A. Othman, M. H. Leong, M. M. Ismail and S. S. S. Ranjit, "Smart home system using android application," *2013 International Conference of Information and Communication Technology (ICoICT)*, Bandung, 2013, pp. 277-280.

[2] D. Javale Mohd. Mohsin, S. Nandanwar and M. Shingate, "Home Automation and Security System Using Android ADK," in International Journal of Electronics Communication and Computer Technology, vol. 3, no. 2, pp. 382-385, March 2013.

[3] Mohamed Abd El-Latif Mowad, Ahmed Fathy, and Ahmed Hafez, "Smart Home Automated Control System Using Android Application and Microcontroller," in International Journal of Scientific & Engineering Research, vol. 5, no. 5, pp. 935-939, May 2014

[4] Christian Reinisch "Wireless Communication in Home and Building Automation", Master thesis, Viennia univeristy of Technlogy, Feb. 2007.

[5] A. J. Bernheim Brush, Bongshin Lee, Ratul Mahajan, Sharad Agarwal, Stefan Saroiu, and Colin Dixon, "Home Automation in the Wild: Challenges and Opportunities", CHI 2011, May 7–12, 2011, Vancouver, BC, Canada

[6] Matthias Gauger, Daniel Minder, Arno Wacker, Andreas Lachenmann, "Prototyping Sensor-Actuator Networks for Home Automation", REALWSN'08, April 1, 2008, Glasgow, United Kingdom.