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IOT Home Automation

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Abstract: ***The Internet of Things (IoT) is the most recent technology platform. We may regulate our daily routine work, such as home applications, control, and simple communication systems, using IOT, and improve our digital services. The Internet of Things (IoT) is a system that intelligently adds everyday content information to the internet in order to facilitate communication between objects and humans, as well as among themselves. In this study, we demonstrate how IoT can improve home automation. The relay, Node MCU, which is a network access component, is used in our suggested system. We can control that equipment using an IoT-based system technique. Mobile phones, computers, and tablets are used as user interfaces in home automation systems. They can connect to the home automation network through a wireless internet connection. The user will interact with the system directly via the control interface, while home appliances will be controlled remotely via a mobile app. An additional aspect of the home automation system is that it may be protected remotely. This redesigned design concept provided a home automation system that could be controlled efficiently.***

Keywords: IOT, home automation, smart home, relay, response time, Node MCU (ESP8266)

I. INTRODUCTION

The Internet of Things is a concept in which any device is assigned an IP address, and anyone may identify that device on the internet using that IP address. It was originally known as the "Internet of Computers." According to statistics, the number of "things" or gadgets that will be connected to the Internet will skyrocket. The "Internet of Things" (IoT) [1] is the name given to the resulting network. Recent technological advancements that allow for the use of Bluetooth and Wi-Fi have enabled many gadgets to communicate with one another. Using a WIFI shield to act as a Micro web server for the Arduino eliminates the need for wired connections between the Arduino board and the computer, lowering costs and allowing it to function as a standalone device. The Wi-Fi shield requires internet access via a wireless router or hotspot, which serves as the gateway for the Arduino to communicate with the internet. An internet-based home automation system for remote control of household appliances has been built with this in mind.

II. LITERATURE SURVEY

The main goal of this study is to use IOT to protect our home automation. Individual location framework is one of the most important aspects of any modern construction, and it is one of the most important parts of the structure. Individual data collected at the right time can help save lives and make things easier. When it is possible, we will identify individuals and submit the information to the nearest police station and our home owners, and we will be able to operate our home equipment from any location where you are found. This is primarily used for general public purposes**.**

A. Present Scenario

1) *Bluetooth Based Home Automation System:* Home automation systems using smartphone, Arduino board and Bluetooth technology are secured and low cost. A Bluetooth based home automation system proposed by R.Piyare and M.Tazil. The Bluetooth system uses a PC or smartphone as receiver device. It has a high communication rate, great security and low cost, so it can be implemented as a real time system. Bluetooth network has limited range of 10 meters if the smartphone is out of range, then it will not be able to control the home appliances, this is one of the main disadvantages of Bluetooth based home automation system.
2) *Voice Recognition Based Home Automation:* Voice recognition based home automation system proposed and implemented by a researcher. The wireless communication between the smartphone and the Arduino UNO is done through Bluetooth technology. This will be more helpful for handicapped and aged people who wants to control appliances by speaking voice command. The main drawback of this system is that communication between user and voice recognition tool depends on signal to noise ratio (SNR), if voice signal is noisy then communication can highly effect and the system will fail to show accuracy.

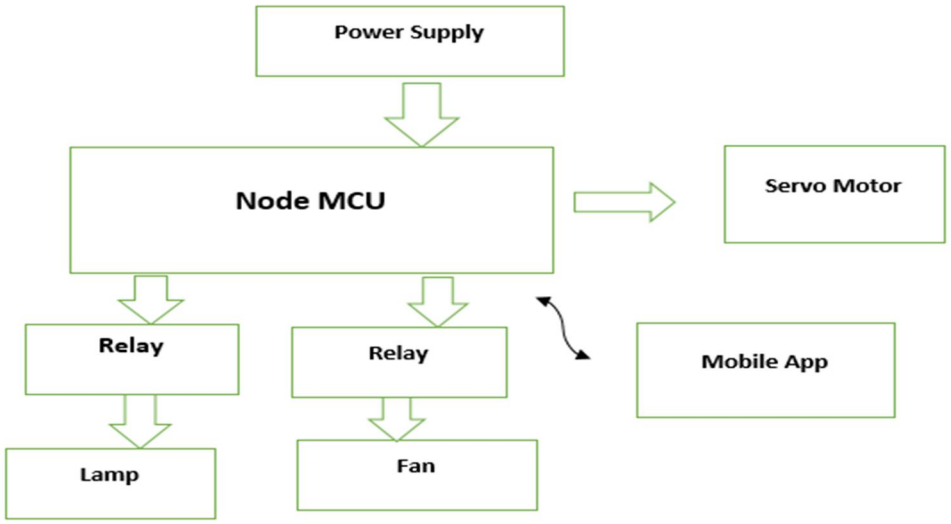
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3) *ZigBee Based Wireless Home Automation System:* ZigBee based wireless home automation system has also been studied, ZigBee is similar to Bluetooth technology. It is one of the broadly used transceiver standard with low data rate and power. It has physical range is between 10 to 20 meters, which can increase up to 150 meters by using direct sequence spread spectrum (DSSS). It is ideal for developing prototypes and research related activities.
4) *GSM Based Home Automation System:* A smart home automation system implemented by using Global System for Mobile communication (GSM). In GSM based home automation systems, communication between main module and appliances is done through text messages. The main drawback of GSM based home automation system is that, there is no guarantee text message deliver to the system every time so it is not a reliable system. These are the drawbacks of existing methods, To overcome that drawbacks we are implementing "IOT Based Smart security and Smart Home Automation.

III. METHODOLOGY

Home automation with a real-time clock is an advanced project that allows you to operate your equipment in a timely and methodical manner. Wireless technology allows the devices to be controlled from other locations. All functioning parameters in devices or appliances can be recorded using an RTC with EEPROM. The project is essentially a notion for bringing automation to the workplace or household. A mobile app will be used to control all of the home appliances. For systematic operation, appliances in the industry or at home will be interfaced with a centralised microcontroller, the NODE MCU. For the operation, the controller's inbuilt RTC and EEPROM will be triggered. The controller was also connected to WIFI in order to accept control orders from the Wi-Fi shield (Wi-Fi hotspot). The operator will be given a mobile app that includes Wi-Fi. If the operator wishes to turn on or off the light, he must use the app's switch control button. When he turns on the Wi-Fi, the data is delivered to the microcontroller's Wi-Fi. When a request is received, the microcontroller activates the RTC and EEPROM, and the action is carried out according to the request. All other appliances can be operated in the same way.

IV. PROPOSED SYSTEM BLOCK DIAGRAM



V. RELEVANT MATHEMATICS ASSOCIATED WITH THE PROJECT

A. *Description*

Where, Q = input sensor data
CB = Read sensor data
PR = predicted result
UB = visualize result

B. Set Theory

Let S be as system which find exact match predefine value and alert
S = In, P, Op,
Identify Input In as In = Q Where, Q = input data
Identify Process P as P = CB, C, PR
Where, CB = read sensor data C = according to sensor PR = predicted result
Identify Output Op as Op = UB
Where,UB = visualize result
After pre-processing the request, system decides particular results. If it is identified, then system suggests the working. =Failure and Successconditions.
Success Conditions:

1) Search the required in formation from available in Datasets.
2) User gets result.

VI. SYSTEM REQUIREMENTS

A. Hardware Requirements

1) Node MCU
2) Power Supply
3) Servo Motor
4) Relay
5) Mobile app

B. Software Requirement

1) Arduino
2) Protius
3) Blink

VII. APPLICATIONS

A. Future Application Areas

1) Put off the Bathroom Fan Automatically
2) Turn Your Webcam into a Security Camera
3) Install a Wireless Intercom
4) Capture Party Moments without using your Digital Camera or DSLR
5) Use Automatic Sprinklers to Water your Garden

B. Advantages

1) Energy-saving
2) Security
3) Communication
4) Comfort
5) Wellness
6) 1 Stop solution for devices of Different Brands

C. Disadvantages

1) Initial cost
2) Maintenance
3) In the event of some type of breakdown, its repair can be complex and expensive. In addition to this, it is possible that an important part of the system will be blocked and more functions will be canceled. Therefore, the cost of any type of breakdown can be very high.
4) Data transmission speed
5) Ring connection

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VIII. RESULTS

A. *Image of Output*



IX. CONCLUSION AND FUTURE WORK

This reconnaissance security framework makes use of a motion sensor, which is low-power and requires little effort. It has a large focal point and is quite easy to integrate with Arduino. This security architecture can be used in a variety of settings, including the home, business, and store. This framework's distinguishing movement affectability run can be found anywhere on the world. Additionally, to strengthen security, this structure can be equipped with glass break finders. To create an effective FOV for larger venues, a combination of multisensory information and complicated calculations can be used. In order to increase the accuracy of the area and the technique for preparing the MOTION sensor flag, more advanced procedures, such as probabilistic hypotheses, are being used. The future of home automation could be very diverse. We can add a wide range of additional enabled features to it in the future to fulfil user needs and make it greener.

Following we have some capabilities below.

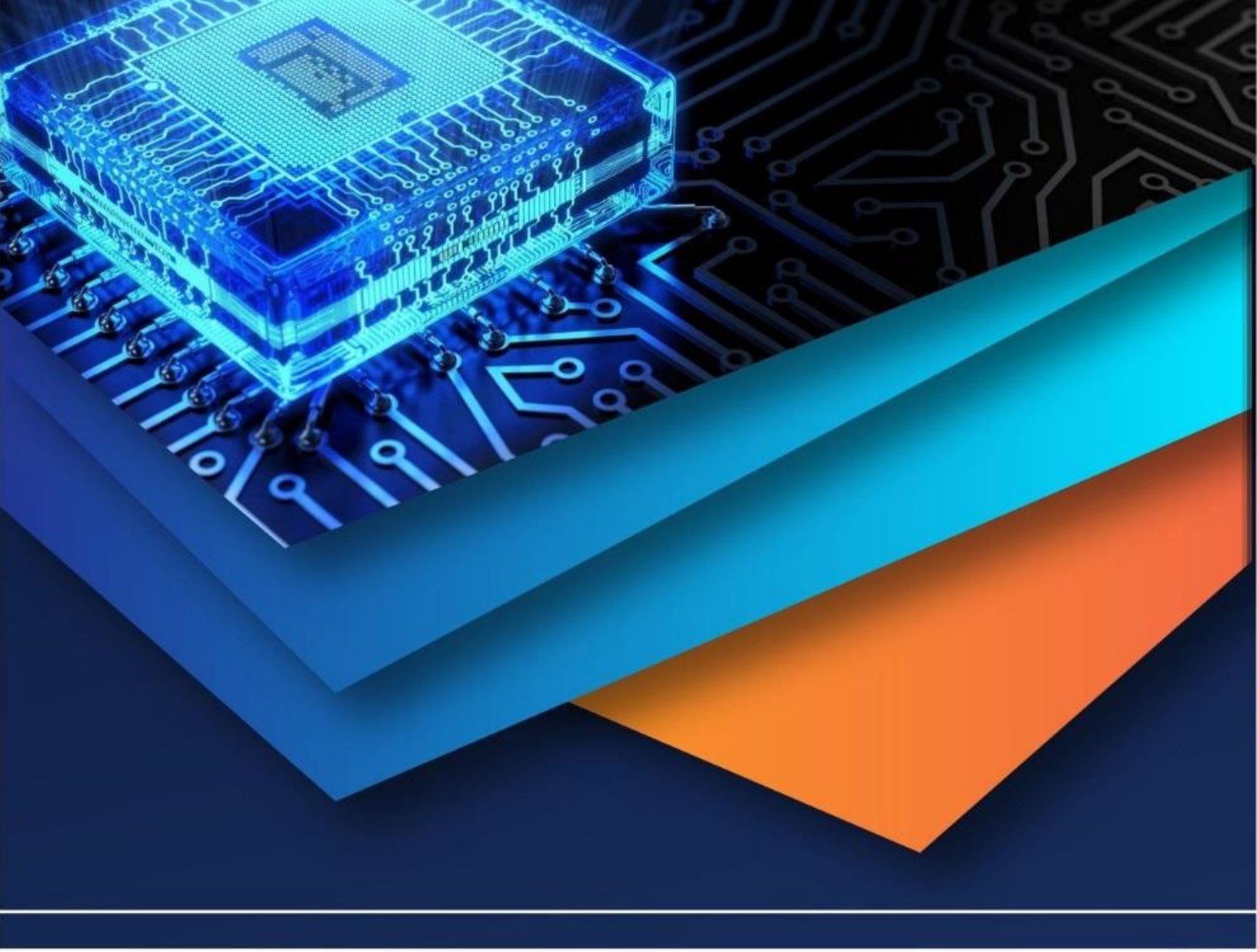
1) Home safety device is going Wi-Fi

2) It may be operated through voice command

3) Person can upload new appliances without external experts

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