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A Virtual Home Assistant (J.A.R.V.I.S.)

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***Abstract*- The way we live, work, study, and remain connected has all been altered by mobile technology. On mobile devices, offering facilities and security is often becoming an essential component. The goal of this study is to create a virtual home assistant that works with Android mobile devices. Wi-Fi is used to establish connection between the mobile device and the system. Electrical equipment commands, such as lights, fans, and air conditioners, may be transmitted simply and rapidly from mobile devices using a simple and pleasant AR-based application that is straightforward to use for any average user. The system then acts and reacts to these orders by performing the tasks specified in the commands and informing the user of the outcome.**

***Index Terms*-** Node MCU, IOT, Relay, AR, and other terms are included in the index.

INTRODUCTION:

The Internet of Things, or IOT, refers to a network of linked devices as well as the technology that enables communication between devices and the cloud as well as between devices.

J.A.R.V.I.S. is a personal home automation assistant with an augmented reality app for managing electrical household equipment.

People nowadays carry their iPhones with them at all times. As a result, using these to manage household appliances makes logical. Today, the cell phone is the most significant aspect of people's life. With the aid of these smart devices, humans can do a variety of tasks, both with and without the internet, such as making our homes and businesses smarter or more luxurious. A virtual assistant system based on a basic AR-based Android application is shown here, which can be used to manage electrical appliances by simply scanning from the camera. The goal of this project is to create a system and Android application that can be used to control appliances from mobile devices. The system consists primarily of an ESP32/Node MCU, a relay, household appliances such as a bulb and a motor fan, and a mobile device for system interface. When someone uses the AR-based smartphone app to scan the target picture, a plane appears on the screen with two virtual buttons, one for ON and the other for OFF. A request is sent to the server along with the signal value when one of these buttons is pressed. The ESP32/Node MCU receives the signal and proceeds to conduct the activities. To send the current pulse to the appliances, this controller is coupled to the Relays of various switches.

We also use a self-made AR-augmented reality software to control and modify the appliances. To turn on the electrical appliance, just focus the camera and it will turn it on, and to turn it off, we may use virtual buttons.

PROPOSED SYSTEM:

Both hardware and software make up the system.

HARDWARE COMPONENTS:

1. ESP32/ Node MCU
2. Relay
3. Wi-Fi
4. Bulb
5. Wires

LANGUAGE USED:

1. C
2. C#

SOFTWARE COMPONENTS:

1. Arduino IDE
2. Unity HUB
3. Blynk Application
4. Vuforia Engine
5. Windows Platform

METHOD RECOMMENDED

Essentially, the idea is a notion to use AR and IOT to bring automation to the workplace or home. Using a smartphone app, you may control all of your household appliances. For systematic work, the home appliances are linked to the centralized microcontroller Node MCU or ESP32. Wi-Fi is also included inside the controller, allowing it to accept control orders from the Wi-Fi shield. The customer will be given an AR-based smartphone app that includes Wi-Fi. If the user wishes to turn on or off the light, he must concentrate on it using the Android application and click one of the virtual buttons, such as on or off. When he switches, a request with the signal pulse is sent to the Blynk server. The microcontroller (Node MCU) sends the current pulse to the relay as soon as the request is received. Similarly, all household appliances may be managed.

Block Diagram:

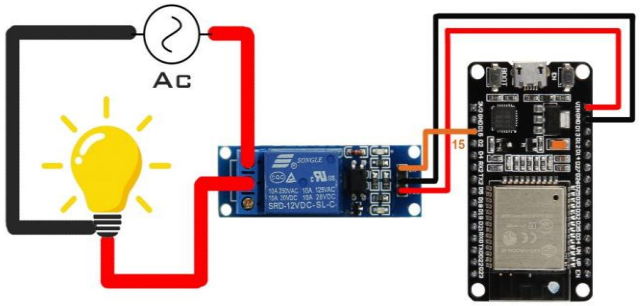

Fig. 1 Block Diagram Proposed

A. MCU/ESP32 Node

NodeMCU (Node Microcontroller Unit) is an open source IoT platform with a cheap cost. It came with software that ran on Espressif Systems' ESP8266 Wi-Fi SoC and hardware that was based on the ESP-12 module at first. Later, the ESP32 32-bit MCU was introduced to the mix.

Open source prototype board designs are available for NodeMCU, an open source firmware. The term "NodeMCU" is a combination of the words "node" and "MCU" (micro-controller unit). The word "NodeMCU" refers to the firmware rather than the development kits that go with it.

There's also 128 KB of RAM and 4MB of Flash memory (for application and data storage), which is more than adequate to handle the enormous strings that make up web pages, JSON/XML data, and everything else we throw at IoT devices these days.

B. Relay

The electromagnetic switch is what a relay is. When two circuits are separated, a relay enables one circuit to switch the other. When we wish to utilise a low voltage circuit to switch on and off a device that requires high voltage for its functioning, we use a relay. For example, a 5V supply linked to the relay is adequate to power a 230V AC mains-powered lamp. Relays come in a variety of operating voltage configurations, such as 6V, 9V, 12V, 24V, and so on. The input and output of a relay are separated into two components. When a tiny input voltage is applied to the input side, a coil generates a magnetic field. Electrical appliances may be turned on or off by utilizing the correct contactor combinations.

Fig. 2 Relay

C. Household appliances

"A gadget, apparatus, or equipment meant to perform an application or work, other than industrial, used in our everyday lives that involves some sort of technology,"

according to the definition. In a nutshell, an appliance is a machine that decreases the amount of effort required by a person to do a certain activity or work. A scissor, for example, is used to trim our hair, an iron box is used to iron our clothing, and a television is used to watch entertainment programs and news from across the globe.

EXPERIMENTAL OUTCOMES

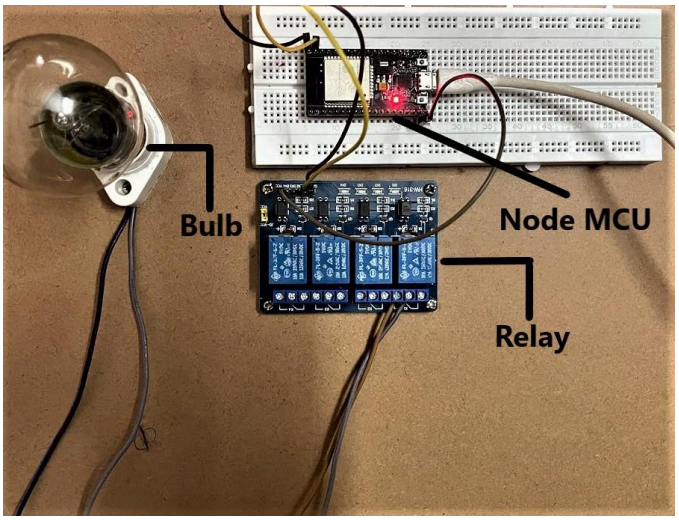

Fig. 4 Experimental Setup

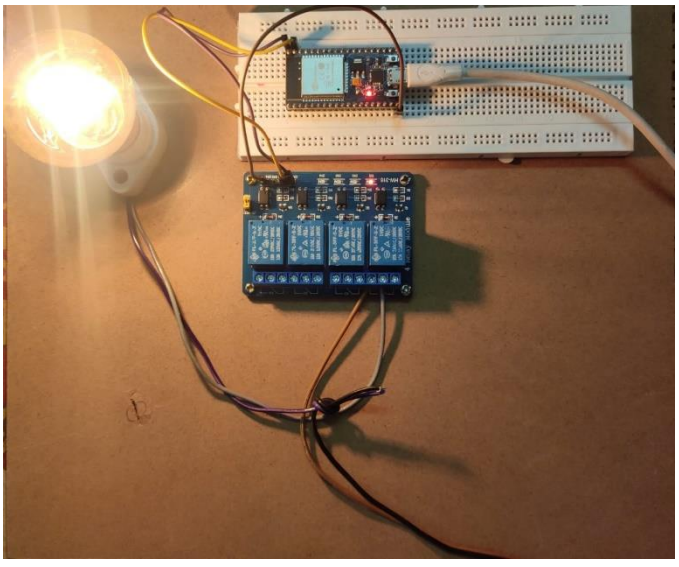

Fig. 5 By pressing the virtual button, the bulb is turned on

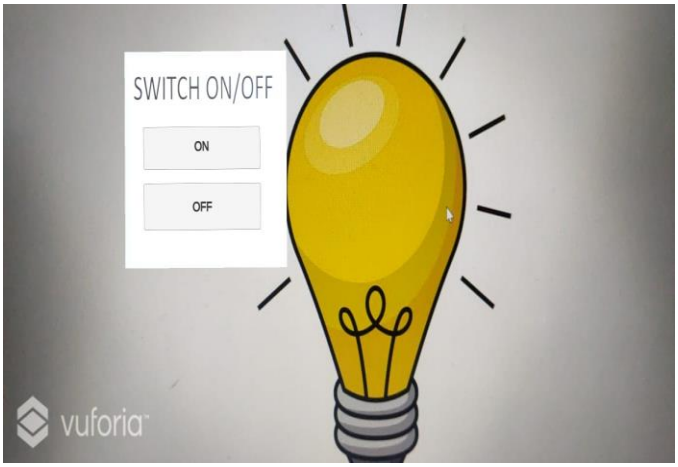

Fig. 6 An example of a virtual button

CONCLUSION

We demonstrated how users may interact with IoT devices using augmented reality in this experiment. AR may be used to bring virtual components into a real-world setting. The AR application allows users to operate household appliances by simply scanning the target picture. We may operate our home appliances with our cell phone in a lot easier method by clicking on the virtual buttons.

FUTURE PERSPECTIVES

This application has the potential to grow into a system with the following additions:

• We're considering using this capability on four-wheeler vehicles to unlock gates by just scanning the car number or QR code.

• A speed control feature may be added to your home system, allowing you to slow down or speed up the system at the touch of a button.

• We can expand the app's functionality to include more household appliances.

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