

Smart Voice Controlled Door Lock and Home Appliances

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ABSTRACT

Now a days, rate of theft is increasing gradually so there is a need of secured door lock system in home. In digitalized world, automation provides an easy working for the individuals. In this proposed system, door can be digitalized to trigger by any voice controlled app or Blynk app. Voice controlled app will be used for person with disabilities though Blynk app can be used by dumb and deaf persons. This model consists of node MCU which will be interfaced by the software app. Using relay door can be adjusted.

Keywords: Node MCU, Blynk app, IFTTT, Relay modules and Solenoid lock.

INTRODUCTION

There are different types of security and door lock devices, in general most of the locks are made up of a physical key and lock system, if the person loses the key it would become a head ache to open the lock. So there came the need for a lock system without the help of a physical key and a large varieties of door locks have been invented some of the most common ones are pin type door locks where we have to enter a pin to unlock the door. There are some other types of door locks that are based on biometrics like fingerprint based door lock system, face recognition door lock system and for some more secured applications we can use retina based door lock systems. There are also some lock systems that can be unlocked with the help of voice recognition.

The voice controlled door lock systems would work by recognizing the voice of the person and would perform the required action. Even though there are several voice recognition systems that can be used for controlling door locks and other applications but in this paper we are going to discuss about a voice controlled door lock and home appliances with the help of Google voice assistant. We can use other voice assistants also for this project like Amazon's Alexa, Microsoft Cortana and Apple's Siri. But Google's voice assistant and Amazon's Alexa are open source so anyone can meddle with them for their personalized accounts without requesting any permission from the developers unlike Microsoft Cortana and Apple's Siri for them we have to request permission before we can meddle with them.

There are several safety measures and door Lock systems that can be used for secure, easy and fast access. In this paper we are going to be using a System which any individual with a little basic knowledge about computers and Smart phones can implement this security system without paying any money to the security agencies and can be accessed from any part of the world. The proposed system in this paper can be operated with the help of two different methods in the first method we are going to be operating the appliances and door lock System with the help of a mobile based application which can be accessed from any kind of Smart phone which might be operating on Android, windows, iOS and so on. The second method we would be using a personalized voice assistant for a particular account with some personalized commands for operating different applications and Door lock System.

In the following sections of the paper we would be organized as follows: Related work in section II, Methodology in section III, Result in section IV, Conclusion in section V and References in the last section.

II. RELATED WORK

There are so many researchers and students who had done their projects similar to our project which are used to detect and notify the authorities about the accidents related to car accidents and they can also be implemented to bikes or 2 wheelers with the help of few modifications.

In[1], in this paper the authors have proposed a system that consists of using a digital lock for a door. Normally people used to have mechanical locks for opening the door but it is difficult for everyone to carry all the time so digital locks are used with passwords. Sometimes PIN may be forgotten so only Electric lock with digital lock is used. If the electricity is available Electric lock is used if the Electricity is not there using smart card one can open door using digital lock.

In[2], the authors have designed a system that consists of using home automation development system to eradicate problems around it. Here development systems have packages similar to microprocessor development systems. In[3], the authors have proposed a system instead of using a digital lock equipment which uses digital information such as secret code and so on, they used a ZigBee module embedded in digital lock and door lock acts as the central main controller of overall home automation. Here RFID tags are used for user identification. In[4], The system consists of using voice activated wireless home devices for improving performance. The speech recognizer has Hidden Markov model technology and tested with the various kinds of noises. The above papers would state some different ideas for secured and smart door locking systems but they don't discuss about an idea where we can use a door lock and home appliances with the help of voice recognition.

III.METHODOLOGY

The command can be given to the System from one of the two methods available that is we can directly use the mobile application to operate the home Appliances and Door lock system or we can use the personalized voice command to operate the respective Appliances or Door lock with the help of voice assistant.

In this proposed model initially we would be using a Node MCU which acts as the main controlling unit for this project the Node MCU has an inbuilt WIFI module. The main chip in the Node MCU is ESP8266. Now we can code the Node MCU with the help of Arduino IDE. We have to download the drivers for using Node MCU and then we can directly include the library for Blynk using Blynk application. After that we have to connect the node MCU to a home WIFI network by giving it the SSID and Password to Node MCU. Now we have to create an account for BLYNK application after which we have to select a new project and then define some buttons for the respective pins for which we are being connected to the relays.

Now we can directly use the buttons in the mobile application and control the appliances and door locks. Now if we want to use a personalized voice assistant for recognizing the commands given to it and perform the required action then we should use IFTTT which acts as an interface between the BLYNK application and the required voice assistant. The IFTTT is a web application which acts a medium, the full form of IFTTT is If This Then That. First we have to link the personal Gmail account and the blynk app with the help of IFTTT then we have to personalize a voice command that we want to give for a particular action in the “if case” after that we have to define the operation that should be performed by the Blynk app. For operating a single relay we have to use 2 voice commands one is for turning the relay ON and the other is for turning the relay OFF.

IV.RESULT

The prototype for the above proposed model is designed and the performance is analyzed for various operations. Two types of operation were performed to test the performance and the result of each is as follow:

1. Mobile Application: Using Blynk app we control the type of operation to be performed. When the button labelled light is pressed light is turned on and similarly one button is associated each for light and fan. Here IFTTT (If This Then That) a web application is used to interface each of the required components and results are obtained successfully.
2. Voice Assistant: Using Google voice assistant a vocal command is given and the assigned operation is performed by recognizing the voice. When we say the command “hey Google! Open the door” it will make the door to open and similar commands were assigned each for fan and light.

V.CONCLUSION

Thus the prototype to make our surroundings automated is developed. This project gives a brief demo on how we can control devices automatically and is explained by taking fan, light, and door lock as an example. This project has a vast extension for operating more number of devices. The more number of devices you need to be automated, the more number of commands you need to give. This is a simpler project and can be implemented anywhere. This project has more scope because the future world is going to be fully automated. Now we have a developed a simple, secured, cost effective and Efficient Smart Voice controlled Door lock and home appliances system for daily use.

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