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SMART HOME AUTOMATION IOT SYSTEM FOR DISABLED AND ELDERLY

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ABSTRACT

In this fast-paced life of 21stcentury, automation plays a key role in human life. Home automation allows us to control household electrical appliances like light, door, fan, AC etc. It also provides home security and emergency system to be activated. Home automation not only refers to reduce human efforts but also energy efficiency and time saving. The main objective of home automation and security is to help handicapped and old aged people who will enable them to control home appliances and alert them in critical situations.

This project put forwards the implementation of home automation and security system using Arduino microprocessor and Android smartphone. Home appliances are connected to the microprocessor and communication is established between the Arduino and Android mobile device or tablet via Bluetooth module. We would develop an authentication to the system for authorized person to access home appliances.

INTRODUCTION

Home, it is the place where one fancies or desires to be after a long tiring day. People come home exhausted after a long hard working day. Some are way too tired that they find it hard to move once they land on their couch, sofa or bed. So any small device/technology that would help them switch theirs lights on or off, or play their favorite music etc. on a go with their voice with the aid of their smart phones would make their home more comfortable. Moreover, it would be better if everything such as warming bath water and adjusting the room temperature were already done before they reach their home just by

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Vol 12, Issue.2 April 2024

giving a voice command. So, when people would arrive home, they would find the room temperature, the bath water adjusted to their suitable preferences, and they could relax right away and feel cozier and rather, feel more homely. Human assistants like housekeepers were a way for millionaires to keep up their homes in the past. Even now when technology is handy enough only the well to do people of the society are blessed with theses new smart home devices, as these devices costs are a bit high. However, not everyone is wealthy enough to be able to afford a human assistant, or some smart home kit. Hence, the need for finding an inexpensive and smart assistant for normal families keeps growing. This paper proposes such inexpensive system. It uses the Google Assistant, the IFTTT [1] application, the Blynk [2] application and the NodeMCU [3] microcontroller as the major components along with a relay board comprising of 4/8 relays along with ULN 2803 IC. Natural language voice is used to give commands to the Google Assistant [4]. All of the components are connected over the internet using WiFi which puts this system under the IoT

LITERATURE REVIEW:

IN "GOOGLE ASSISTANT CONTROLLED HOME AUTOMATION" The idea behind Google assistant-controlled Home automation is to control home devices with voice. On the market there are many devices available to do that, but making our own is awesome. In this project, the Google assistant requires voice commands. Adafruit account which is a cloud based free IoT web server used to create virtual switches, is linking to IFTTT website abbreviated as "If This Than That" which is used to create if else conditional statements. The voice commands for Google assistant have been added through IFTTT website. In this home automation, as the user gives commands to the Google assistant, Home appliances like Bulb, Fan and Motor etc., can be controlled accordingly. The commands given through the Google assistant are decoded and then sent to the microcontroller, the microcontroller in turn control the relays connected to

it. The device connected to the respective relay can be turned On or OFF as per the users request to the Google Assistant. The microcontroller used is NodeMCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet) “Home automation” refers to the automatic and electronic control of household features, activities, and appliances.

IN “INTERNET OF THINGS (IOT) BASED HOME AUTOMATION SYSTEM USING GOOGLE ASSISTANT”

Developing technology and lifestyle allows us to provide more convenient working and living spaces. Likewise, the majority of people, especially the elderly and sick, spend much of their time at home. With the difficulty of dealing with the devices and their inability to adapt to the developed and modern equipment, this creates a kind of chaos and obstruction for them in carrying out their daily activities. Therefore, improving the feeling of safety, comfort and ease in the home is a task of great social importance. Home automation or even a smart home is known as a dwelling equipped with computers, automation and electronic technologies and it is a surrounding environment that aims to help residents in various home life situations by improving comfort and simplifying a number of tasks. A home automation system typically connects controlled devices to a central hub or "gateway". The user interface for control of the system uses either wall-mounted terminals, tablet or desktop computers, a mobile phone application, or a Web interface, that may also be accessible off-site through the Internet. With the help of Smart home system, the user can supervise household appliances remotely and realize real-time monitoring of home security status through mobile phone. The users can exchange information with home appliances, they also can monitor and control equipment to perform their command remotely.

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Vol 12, Issue.2 April 2024

Group-Wise Itinerary Planning in Temporary Mobile Social Network

emporary mobile social networks has been used at hotels, concerts, theme parks, and sports arenas, where people form a mobile social group for a short time with a common interest or activity. People confined to such specific places or activities are allowed to join the temporary mobile social networks using their main social network accounts (e.g., Foursquare, Facebook). Users registered for the same business/research conference may have common connections and thus may be willing to travel together in the conference city. Traveling with temporal friends can improve the mobile users' experiences as well as help them save money. Currently, renting cars to travel around becomes very general, and one car usually can contain at least four guests. Therefore, traveling with temporal friends can help those guests save their travel cost, such as renting cost and oil cost. To this end, in this paper, we propose a group-wise itinerary planning framework to improve the mobile users' experiences. The experiment results over real data sets illustrate the effectiveness of our proposed framework.

Existing system:

In the existing system, home appliances are controlled through Zigbee and other devices. But they are limited to certain area.

In the proposed system we have designed so as to control home appliances from anywhere in the world. DTMF can also be used but it won't come for practically and also not reliable.

Drawbacks:

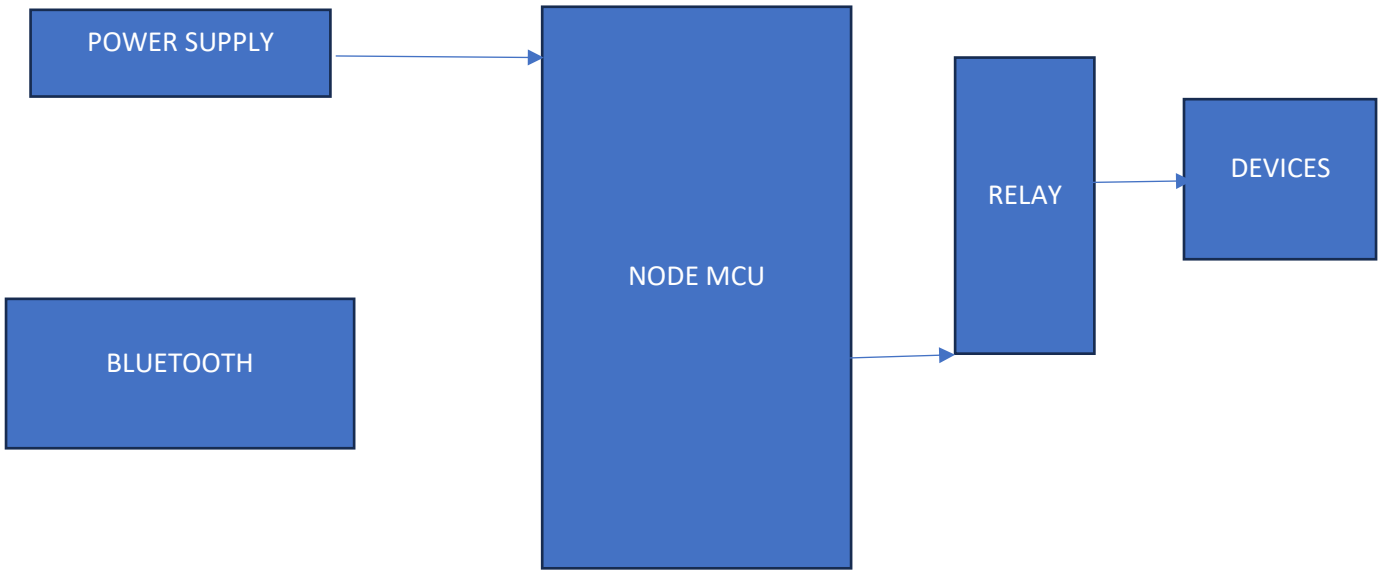
- Long distance communication is not done
- No Android application is involved so we cannot operate from long ranges.

Proposed system:

In this project we will use android Bluetooth app which is connected to the Bluetooth which is interfaced with Arduino. From the we will give some commands based on that light and fan will on or off. In this project we can control the loads by using different languages. The Languages can be set in the app. The corresponding commands will be given in code.

ISSN2321-2152
www.ijmece .com
Vol 12, Issue.2 April 2024

Block Diagram:



by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

HARDWARE COMPONENTS

LCD (Liquid Cristal Display)

Introduction:

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked

A program must interact with the outside world using input and output devices that communicate directly with a human being. One of the most common devices attached to an controller is an LCD display. Some of the most common LCDs connected to the contollers are 16X1, 16x2 and 20x2 displays. This means 16 characters per line by 1 line 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.

BLUETOOTH

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Bluetooth is an open wireless technology standard for exchanging data over short distances (using short wavelength radio transmissions) from fixed and mobile devices, creating personal area networks (PANs) with high levels of security. Created by telecoms vendor Ericsson in 1994 it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization.

3. RF AND BASEBAND

3.1. RF

Bluetooth operates at the unlicensed 2.5GHz Industrial-Scientific-Medical (ISM) band. There are already many types of devices using this band, such as baby monitors and garage door remote controls. To avoid interfering with these devices, Bluetooth devices send out very weak signals (about 1 milliwatt). This limits the transmission range to 10 meters. It also uses a frequency hopping technique, hopping randomly between 79 1-MHz channels 1600 times per second (625 us time slot). Each piconet is synchronized to a specific frequency hopping pattern, so that even different piconets do not interfere with each other. A piconet can either be static or dynamic (changing when devices move in or out).

CONCLUSION

Current systems in IoT environments use a large amount of various sensor data. The types of sensors vary, because smart devices are used differently according to the location, and methods for using the sensors also vary according to their purposes. However, most existing studies have focused on cooperation between devices or task efficiency, and there is a tendency for these systems to have manual operations, because they have not created an environment with sensors or other media. Smart home systems must be able to create relationships between various sensors attached to devices within the home and link them to efficiently perform tasks such as energy management, cooling, heating, and ventilation. Various sensor data must be collected, and monitoring services must be provided to the user. To

process fast and continuous stream data collected from sensor networks in an IoT environment, the hash table-window join operator multiple MJoin was used to optimize queries, and the SVM algorithm was used to classify and reduce data for the purpose of efficiently managing stream data storage. A global shared query execution technique for the query optimization of multiple MJoin was used, and experiments verified that it yielded notable improvements in performance with relatively few searches. This study evaluated the system performance through experimentation according to changes in sliding window size and the selected optimal kernel function of the SVM classification algorithm through evaluations of different kernel functions for efficient storage management of the stream data. Based on the performance evaluation results, the sigmoid kernel function was selected as the optimal kernel function for the SVM classification algorithm. According to the SVM classification algorithm results based on changes in sliding window size, the average error rate was 2.42%, the reduction result was 17.58%, and the classification accuracy was 85.94%. Based on the comparison of the SVM classification performance with that of other algorithms, the SVM classification algorithm achieved a minimum 9% better classification performance than the other classification algorithms evaluated. In addition, this study has proposed an IoT-based smart home system that can use the classified and reduced sensor data to intelligently control devices within the home. The results of experiments on the classification and reduction techniques proposed in this study demonstrated that when the window size was divided by 5000, the storage space was reduced by a maximum of 18.7%, which was the most efficient. It was found that as the window size became larger, this reduction increased. The classification accuracy was highest at 88.6% with the window size divided by 3000. In this study, we conducted experiments by arbitrarily assuming 20 IoT environment sensors to optimize the multiple Mjoin query processing. Given that various sensor data are generated without noticeable delay for a home system in the IoT environment, a method that can efficiently process a large amount of sensor data is necessary. Therefore, based on comparison of the conventional Mjoin and multiple Mjoin methods, we proposed a method of optimizing the query processing of stream data. In addition, to address the situation of the smart home system based on the IoT, we

classified the sensor data (temperature, humidity, and gas) measured through the Arduino module and date data into tasks using a decision tree. Then, we set up the devices using the sensor data. Furthermore, we designed the system to intelligently control the priorities for ventilation, temperature, fire, and break-in using five sensors. Considering that the designed system was implemented using only the limited sensor data measured through the Arduino module, several areas did not reflect all the environments of the home system in the IoT environment. Thus, in the future, if we use the classified and reduced sensor data proposed in this study using various environmental sensors, the efficiency and convenience of the system are expected to increase because we will be able to configure an environment with a more intelligent system than the conventional home system, thus meeting users' requirements. In future research, it will be necessary to study a more efficient sensor data-processing algorithm, which takes the processing time into account. Future studies will also expand on and refine the classification statuses of the decision-making tree proposed in this study. In addition, future studies will use this system in a variety of IoT environments other than a home system, to create more convenient and efficient IoT environments regardless of location

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