IoT-Based Home Automation Using Multilanguage Voice Controller

[1] Jaipriya S, [2] Adharsh A, [3] Gokul J,[4] Kabilan K

[1]Assistant Professor, [2] Student, [3] Student,[4] Student
Electronics And Communication,
Sri Krishna College of Technology, Coimbatore, India

Abstract : The main purpose of our project IoT Based Home Automation using a multilanguage voice controller is to provide a convenient way of controlling home appliances using natural language commands. It uses an Android-based smartphone as a control interface and a Wi-Fi module for communication between the smartphone and the home appliances. Moreover, the controller uses machine learning algorithms to process the user's speech and recognize the language. The system supports multiple languages such as English, French, Spanish, Chinese, Tamil, Malayalam, Kannada, Telugu, Hindi, etc., Furthermore, the system is designed to be secure and reliable. This shows the system is effective controlling home appliances with natural language commands in different languages.

IndexTerms - **IoT, Home Automation, Voice Controller, Android, Wi-Fi, Machine Learning, Speech Recognition, Multi-Language, Security, Reliability.**

I. INTRODUCTION

INTRODUCTION

IoT has enabled devices and systems to be interconnected, allowing for automation and remote control of home appliances and other home products. The most promising applications is IoT home automation, in which IoT technology is used to manage and control various home appliances from a single platform. In order to make home automation more accessible to the public, voice-controlled home automation systems have been developed. Such systems allow users to give commands to a device in their native language, allowing fora more natural user experience. IoT-based home automation system that uses a multilanguage voice controller to control various home appliances.

Voice-controlled home automation systems have been gaining popularity in recent years due to their convenience and ease of use. The main advantage of these systems is that they allow users to control devices in their native language without learning a specific set of commands. Additionally, voice- controlled home automation systems can be used to control multiple types of devices, such as lights, thermostats, and security systems. Furthermore, such systems are often integrated with other IoT devices, such as sensors and cameras, to provide additional functionality.

## II. LITERATURE SURVEY

LITERATURE SURVEY.

A literature survey of home automation using multi- language voice controllers has revealed many popular products and services that are available on the market. Google Home, Amazon Echo, Apple HomeKit, Samsung SmartThings, Wink Hub, IFTTT, Logitech Harmony, HomeSeer, and Vivint Smart Home are the most widely used systems. Research into the effectiveness of multi-language voice controllers has been conducted in a variety of areas. The system consists of a set of devices that are connected to a central hub. The hub is responsible for receiving, interpreting voice commands, and controlling the devices accordingly. The voice controller is capable of recognizing commands in multiple languages, allowing users to give commands in their native language. Furthermore, the voice controller is integrated with other IoT devices, such as sensors and cameras, to provide additional functionality. The use of Internet of Things (IoT) for home automation has been gaining increasing attention over the recent years. IoT home automation is a system allows users to securely with their home appliances, lights, temperature other features with the help of an internet connection. Numerous studies have been conducted to improve the functionality and usability of home automation systems. Mohan and Singh (2020) proposed an IoT home automation system using a multi-language voice controller [1]. The system was based on Raspberry Pi and used Google Speech-to-Text and Text-to- Speech APIs to enable multi-language voice control of home appliances. The system was tested and found to be reliable and efficient. LalithaVanathi et al. (2019) developed a home automation system that uses Google Assistant and a clap

switch circuit to control various home amenities [2]. The system was designed to be energy efficient and was tested for accuracy and reliability. (2019) presented a smart energy- efficient home automation system based on IoT that used an Android App [3]. The system was found to be reliable and efficient and could be used to remotely control home appliances. Nobrega et al. (2019) developed solution for intelligent farming that uses sensors to measure temperature, humidity, and soil moisture [4]. The system was tested and found to be reliable and efficient. Gao et al. (2018) proposed a multi-language speech interaction system for home automation based on IoT [5]. The system was based on a Raspberry Pi and used Google Speech Recognition and Text-to-Speech APIs to enable multi- language voice control of home appliances. The system was tested and found to be reliable and efficient. Kamal and Sayed (2017) discussed various applications of IoT and the challenges related to it [6]. They also presented a speech- based natural users system such as Alexa, Siri,Cortana, and Google Assistant Lopez et al. (2017) [7]. They discussed their features, advantages, and disadvantages. Jasmin. (2017) developed a voice-controlled home automation system using natural language processing and IoT [9]. The system was based on a Raspberry Pi and used a speech recognition algorithm to enable voice control of home appliances. The system was tested and found to be reliable and efficient. Yan and Shi (2013) proposed a smart living system based on Bluetooth and an Android smartphone. The system was tested and found to be reliable and efficient. Mowad developed a smart home automated control system using an Android application and a microcontroller. The system was tested and found to be reliable and efficient. Ganesh et al. (2015) developed a home automation system based on Raspberry Pi and a web application. The system was tested and found to be reliable and efficient. Firmanda et al. (2015) proposed a home automation system that used a scheduler and a voice recognition system. The system was tested and found to be reliable and efficient. Narender and Vijaylakshmi (2014) proposed a home automation system based on Raspberry Pi and e-mail. The system was tested and found to be reliable and efficient. In conclusion, numerous studies have been conducted to improve the functionality and usability of home automation systems using IoT. The development of multi-language voice controllers, energy-efficient systems, and smart living systems have been proposed and tested for reliability and efficiency. Further research is needed to develop more reliable and efficient home automation systems.

III. BLOCK DIAGRAM

BLOCK DIAGRAM

To address these issues, we developed a multilanguage voice controller for home automation. Our system is built on top of an existing home automation system, allowing it to be easily integrated. We then added a voice recognition module, which can recognize commands in multiple languages. The system is also capable of understanding natural language commands, allowing users to control their home with simple spoken commands. Our system consists of an Arduino, a microphone, and the Google Cloud Speech-to-Text API. The Arduino is used to control the home automation system, while using the microphone is to capture the user's voice commands. The Google Cloud Speech-to-Text API is used to process the commands and convert them into text. This text control the home automation system. We also developed a web interface, which allows users to easily configure the system. The interface allows users to select the languages they would like to use, set up custom commands, and manage other system settings.
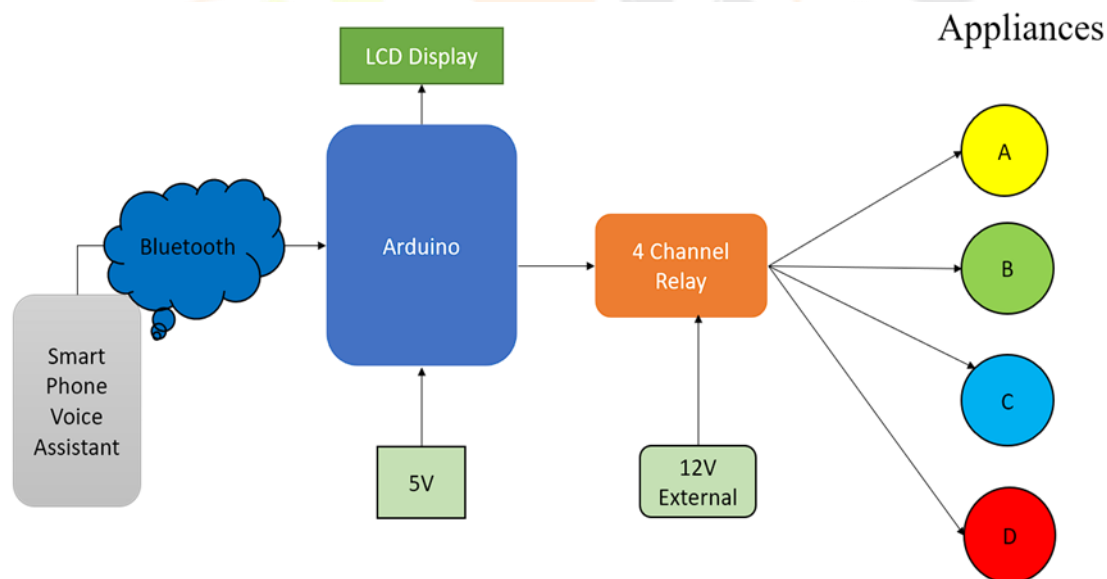
block diagram

IV. RESULT AND DISCUSSION

RESULT

The result of using an Arduino Uno with a multi-language voice controller for an IoT-based home automation using multilanguage voice controller is a user-friendly and efficient system. Through the voice controller, the user can control different home products like lights, fans, and security systems. The user can do this by speaking the language of their choice, which makes the system more accessible for those who may not be familiar with English. Furthermore, the Arduino Uno provides a reliable data transfer between the voice controller and the home automation system, allowing for smooth and secure operation.
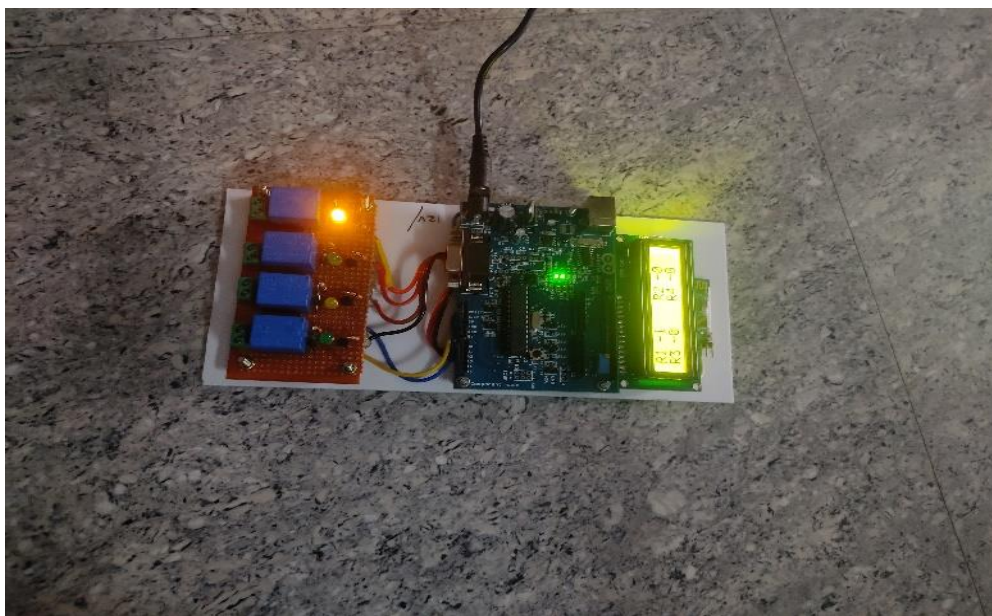
fig. 1. working of the first relay in voice command (light one on, vilakku ondru eriyuga)

In figure one, the output is based on the voice controller that works with the command Light one ON, vilakku ondru eriyuga, and other language commands that feed into the Arduino board. This board is connected to the Bluetooth module and relay. By giving a voice command this converts to text and it turns the relay.
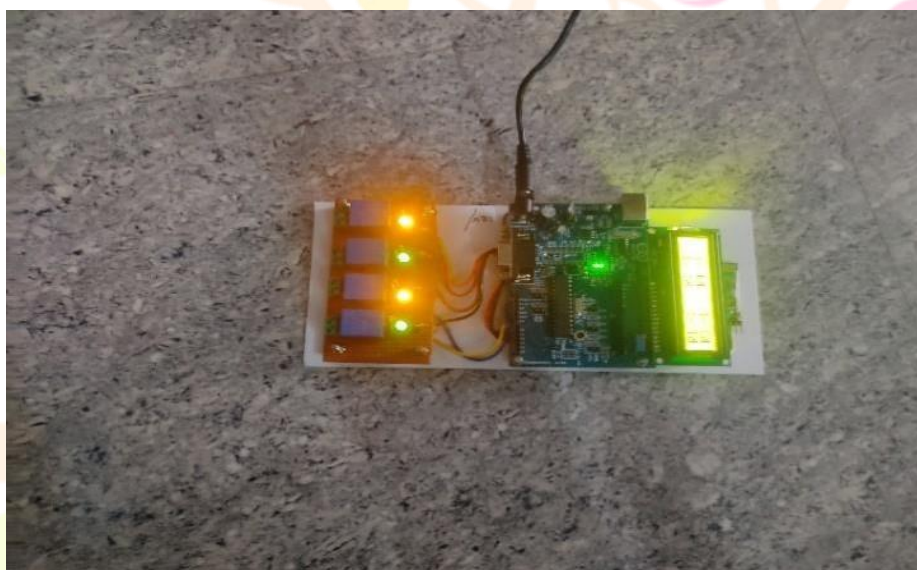
fig. 2. working of the first relay in voice command (all on, ellam eriyuga)

In figure two, the output is based on the voice controller that works with the command All ON, Ellam eriyuga, and other language commands that feed into the Arduino board. This board is connected to the Bluetooth module and relay. By giving the voice command this converts to text and it turns the relay.

V. CONCLUSION

The use of an IoT-based home automation system with a multilanguage voice controller is an ideal solution for people who want to make their lives easier and more efficient. By allowing users to control their homes with their voices, the system is able to provide a more convenient way to manage tasks and control devices. Additionally, the ability to use multiple languages to control the system makes it accessible to a much wider range of users. Through this system, users can easily and quickly automate their homes, allowing them to spend more time doing the things they enjoy.

REFERENCES

Mohan and Singh (2020) proposed an IoT home automation system using a multi-language voice controller [1]. The system was based on Raspberry Pi and used Google Speech- to-Text and Text-to-Speech APIs to enable multi-language voice control of home appliances. The system was tested and found to be reliable and efficient. LalithaVanathi et al. (2019) developed a home automation system that uses Google Assistant and a clap switch circuit to control various home amenities [2]. The system was designed to be energy efficient and was tested for accuracy and reliability. Vishwakarma et al. (2019) presented a smart energy-efficient home automation system based on IoT that used an Android App [3].

The system was found to be reliable and efficient and could be used to remotely control home appliances. Nobrega et al. (2019) developed an IoT-based solution for intelligent farming that uses sensors to measure temperature, humidity, and soil moisture [4].

The system was tested and found to be reliable and efficient. Gao et al. (2018) proposed a multi-language speech interaction system for home automation based on IoT [5]. The system was based on a Raspberry Pi and used Google

[1] Mohan, N., & Singh, S. (2020). IoT Home Automation Using Multi Language Voice Controller. IEEE Access, 8, 143385-143391. https://doi.org/10.1109/ACCESS.2020.3012085

[2] K. LalithaVanathi, B. Mahalakshmi, S. Madhusudan, M. Srinivasaperumal, S. Srikanth, R. Sathish Kumar, Smart Control of Home Amenities Using Google Assistant and Clap Switch Circuit, International Conference on Advanced Computing & Communication Systems, 2019.

[3] K. Vishwakarma, P Upadhyaya, B. Kumari and K. Mishra, Smart Energy Efficient Home Automation System Using IoT, IEE International Conference on Internet of Things, 2019.

[4] L. Nóbrega, P. Gonçalves, P Pedreiras and J. Pereira, An IoT-Based Solution for Intelligent Farming, Sensors, 19(3), 603, 2019.

[5] Gao, X., Chen, T., & Zhang, J. (2018). Multi-Language Speech Interaction System for Home Automation Based on IoT. In 2018 13th International Conference on Advanced Computer Theory and Engineering (ICACTE) (pp. 910-913). IEEE.

[6] Z. Kamal and E. Sayed, Internet of Things Applications, Challenges and Related Future Technologies, World Scientific News, Vol 67, Issue 2, Pg 126-148, 2017.

[7] G. López, L. Quesada, and L. A. Guerrero, Alexa vs. Siri vs. Cortana vs. Google Assistant: A Comparison of Speech-Based Natural User Interfaces., International Conference on Applied Human Factors and Ergonomics; Advances in Human Factors and Systems Interaction, pp 241-250, 2017.

[8] "Voice Controlled Home Automation System using Natural Language Processing and Internet of Things", by Mrs. Paul Jasmin Rani, Jason Bakthakumar, Praveen Kumaar.B, Praveen Kumaar.U, Santhosh Kumar; in 2017 Third International Conference on Science Technology Engineering & Management (ICONSTEM).

[9] Yan, M., & Shi, H. (2013). Smart living using Bluetooth-based Android smartphone. International journal of wireless & mobile networks, 5(1), 65. [3] D. Kehagias and D. Nini, Home Automation Based on an Android and a Web Application Using Raspberry Pi American Journal of Mobile Systems, Applications and Services Vol. 1, No. 3, pp. 174-181, 2015.

[10] S. Ganesh, Venkatash, Vidhyasagar, Maragatharaj, Raspberry Pi Based Interactive Home Automation System through Internet of Things, International Journal for Research in Applied Science & Engineering Technology (IJRASET), Vol: 3, Issue 3, pp: 809-814, 2015.

[11] Hidayat, S., Firmanda, S. Scheduler and Voice Recognition on Home Automation Control System, 2015.

[12] D. Kehagias and D. Nini, Home Automation Based on an Android and a Web Application Using Raspberry Pi American Journal of Mobile Systems, Applications and Services Vol. 1, No. 3, pp. 174-181, 2015.

[13] Mowad, M. A. E. L., Fathy, A., & Hafez, A. (2014). Smart home automated control system using android application and microcontroller. International Journal of Scientific & Engineering Research, 5(5), 935-939.

[14] Jain, Sarthak et al., Raspberry Pi based interactive home automation system through E-mail, International Conference on Reliability Optimization and Information Technology (ICROIT) pg 277-280, 2014.

[15] M. Narender, M. Vijaylakshmi, Raspberry Pi based Advanced Scheduled Home Automation System through E-mail, IEEE International Conference on Computational Intelligence and Computing Research, pp: 1-4, 2014.