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Multilanguage Voice Control IOT Home Automation

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ABSTRACT: Introducing a voice-activated smart home system that combines a GUI interface, an Arduino Uno, and a WiFi module This union improves user accessibility and convenience by enabling multilingual voice commands or remote appliance management through smartphones. WiFi synchronizes Arduino and GUI interface communication, allowing control over the appliance. The system offers affordability and user-friendliness by utilizing the Microchip ATmega328P microprocessor and the compact design of the Arduino Uno. The Arduino Uno and mobile devices can communicate remotely through the WiFi bridge, enabling smart home interaction. Users can use options for control and monitoring in real time. Language obstacles are overcome by an exceptional multilanguage support function, which guarantees smooth communication regardless of spoken language. This diversity demonstrates our dedication to user-centered design. The well-balanced combination of hardware and software is an easy-to-use, effective smart home configuration that combines voice control ease and Internet of Things capabilities.

KEYWORDS: Arduino Uno, WiFi module, GUI, User friendly, AT megachip 328P.

I. INTRODUCTION

It can be tedious and nearly impossible for some people to manually operate the several gadgets that are located in their homes. This system's new, user-friendly interface makes it easier for users to interact with household appliances. Research on voice recognition software and user needs was done as part of the first development phase, which surveyed the state of the industry. These investigations served as the basis for the prototype requirements, which served as the objective for the ensuing phases of execution. The completed prototype, a system that can translate speech as commands, is also shown in the study. To make the interaction feel more natural, there are various ways to formulate these commands. An suitable action is performed on the appropriate home equipment following the interpretation of a command. Radio-controlled outlets are utilized to accomplish the control of various pieces of equipment. The prototype can operate the majority of equipment that has on/off switches thanks to the usage of outlets. In the event that the user experiences difficulty speaking, the prototype can alternatively be utilized with a graphical user interface.

II. RELATED WORK

1. Emily Chen examined the metadata. The research trends and approaches in multilanguage voice interaction for smart home systems are examined in this meta-analysis. In order to pinpoint common themes and best practices, it synthesizes the results of several investigations. He noted that although multilingual voice interface systems are getting more advanced, it is still difficult to integrate them seamlessly and win over users.

2. The review by Sarah Johnson examines current developments in multilingual voice control for smart homes with an emphasis on UI design, language translation, and speech recognition. It summarizes the results of current research and points out new developments as well as potential avenues for further study in the area. His observation examined the latest developments in multilingual voice control technologies, with a focus on enhancements to user interface design, language translation quality, and speech recognition accuracy. It notes that multilingual speech interfaces in smart homes are becoming more scalable and perform better when deep learning methods and cloud-based services are combined.

III. METHODOLOGY

(1) This system architecture is a conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system. The figure shows a general block diagram describing the activities performed by this project.

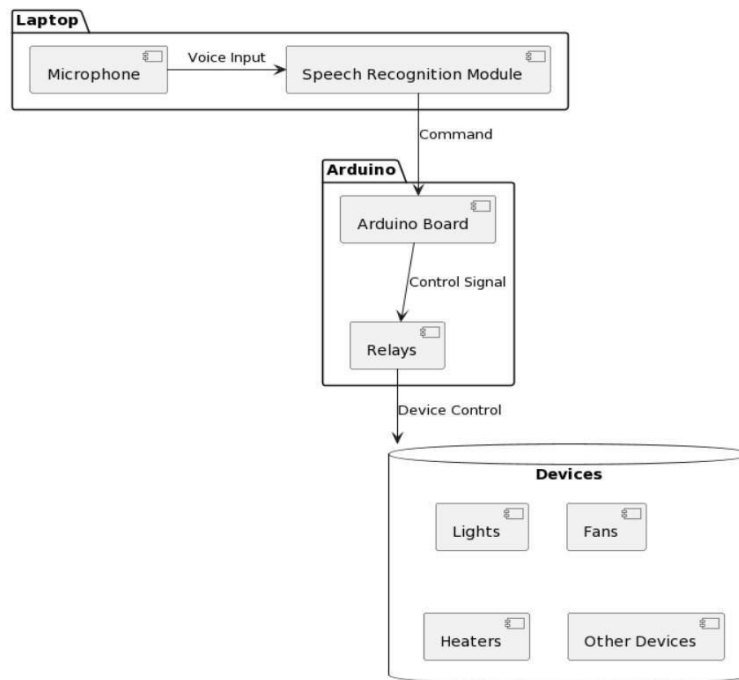


Fig 1: System architecture

This explain how the flow is carried out. Initially the speech input is given via the microphone. These voice input are captured and analyzed by the speech recognition modules used in the program . Once the speech are recognized they are transferred to Arduino board as a commands. These commands are accepted by the Arduino board and the Arduino sends the control signal to the related relay switch. The relay acts as abridge between the Arduino and the devices. Depending upon which switch of the relay is on that particular device is turned on or off depending upon the commands.

IV. EXPERIMENTAL RESULTS

The connections are made according to the circuit diagram. Whenever a user gives the input as a voice command the microphone receive these commands and send to the speech recognition module. Here the user can give the input either in English, Kannada or Hindi depending upon their requirement. Assume if the user have given command in English for example “Turn on the light” the command is received by Arduino board and convert them into a control signal and sends for the particular channel of the relay .The relay turn on the light according. Similarly other devices can be on and off in any of these languages.

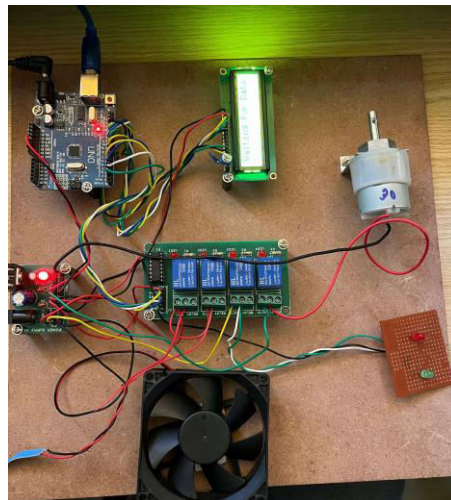


Fig 2: Result of the LED turn on

V. CONCLUSION

The Arduino Uno is used to construct the Smart Home Automation system, which uses voice and speech recognition to automate a number of appliances. To give commands to the devices, utilize the voice to command converter. The implementation of the system makes use of an Arduino microcontroller, which is configured to operate a variety of home automation devices in response to both direct user commands and sensor outputs. The system is configured to be able to communicate via WiFi. The system's demonstrations indicate that it makes it easier for intended users, particularly the elderly and disabled, to operate home-based appliances, lights, heating and cooling systems, and security equipment. The execution of this project has been successful overall. The project's user-friendliness and cost-effectiveness are taken into account and achieved. The home appliances can be automated using the system. The wireless system allows for complete functionality and control of the system.

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