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Automated Multimodal Classroom System

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Abstract*—Robotization is another pattern in the purchaser showcase. There are numerous robotization frameworks with various highlights and offices. In this undertaking, there is a controlling study hall machine utilizing hand motions and voice acknowledgment. This framework is fundamentally intended for physically provoked individuals to help them in working the machines separately. Motions allude to the expressive development of human parts having a specific message to be conveyed to a beneficiary. Human hand signals are methods for non-verbal communication among individuals. Signals have profound roots in our correspondence. Voice is the most basic segment of any correspondence framework since it makes an individual association between individuals. Voice is distinguished utilizing an android application which is associated utilizing Bluetooth Module. In this framework, sensors are utilized to distinguish hand movement and android application for recognizing voice input. This undertaking presents a minimal effort framework to control the electronic gadget utilizing Microcontroller with the assistance of Hand signal and voice acknowledgment.*

Keywords—Robatization, Framework, Communication, Voice.

I. INTRODUCTION

Here, it tends to specialize in the hand gesture and voice controlled automation system that helps to manage the appliances. Automation plays a key role in human life. Automation permits US to manage electrical appliances like lightweight, door, fan, AC etc. It conjointly provides security and emergency system to be activated. Automation not solely refers to scale back human efforts however conjointly energy potency and time saving. During this system, Hand gesture is detected victimization gesture device whereas voice is recognized victimization humanoid application. The most objective of automation and security is to assist disabled and recent aged folks that can change them to manage appliances and alert them in vital things.

II. LITERATURE SURVEY

TABLE1
Literature Survey

Sr No.	Title	Author	Publication & year	Work Done
1	Voice and Touch Control Home Automation	Sushant Kumar S.S.Solanki	IEEE 2016	AMR_Voice and Android Bluetooth Control Application is used.
2	Gesture Based Home Automation System	Arathi P.N,S.Arthika,S.Ponmithra	IEEE 2017	Gesture is captured using camera and real time operation is performed using MATLAB

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3	Voice Control of Home Appliances using Android	Norhafizah bt Aripin M. B. Othman	IEEE 2014	Home Application is built and uses Bluetooth Module for Automation
4	Control of Home Devices based on Hand Gestures	Pomboza-Junez, Gonzalo, Holgado-Terriza Juan A	IEEE 2015	An armband for gesture captural called MYO is used
5	Gesture Controlled Home Automaton	Rakesh Dhotre Raunak Agarwal	IJSER 2017	It includes a gloves which has Flex sensor for Detecting Gesture

III. PROPOSED METHODOLOGY

Block Diagrams

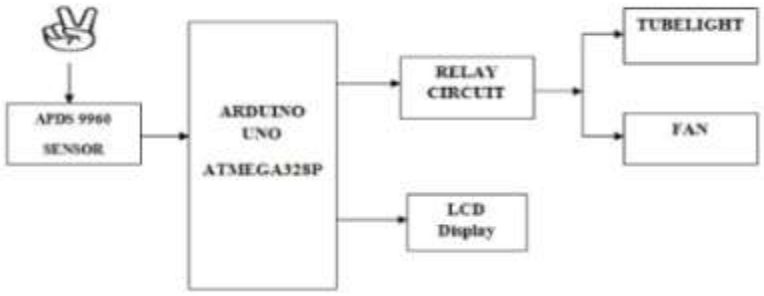

FIGURE 1: Block diagram of Hand Gesture

Block diagram of the Hand gesture based automation system is shown in Fig.1. The relay circuit, gesture sensor, and the LCD module are interfaced with the Arduino board. The Arduino UNO controls and operates the different interfaced sensor, actuators and modules. The 16X2 LCD display is used to display the drag-able list of devices. The APDS-9960 sensor module is used for reading gesture. It has six pins - VL, Ground, VCC, SDA, SCL and Interrupt. The relays are used to switch the AC appliances ON or OFF in the project.

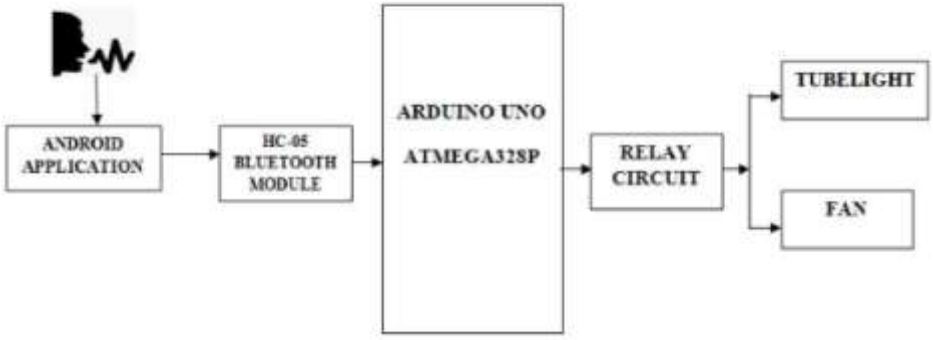

FIGURE 2: Block diagram of Voice Recognition

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Block diagram of the voice controlled automation system is shown in Fig. 2. The circuit consists of Arduino Uno board (Board1) for comparing the input string received through Bluetooth with the stored string to give output to digital pin of Board1 to control the relay. Bluetooth module HC-05 transmits and also receives data serially via Board1 that can be read by the microcontroller (MCU). A relay is used here to control multiple appliances. Arduino Uno has 14 digital pins, each of which can be used to control an appliance. The MCU can be programmed to compare the relative strings (speech).

Flowcharts

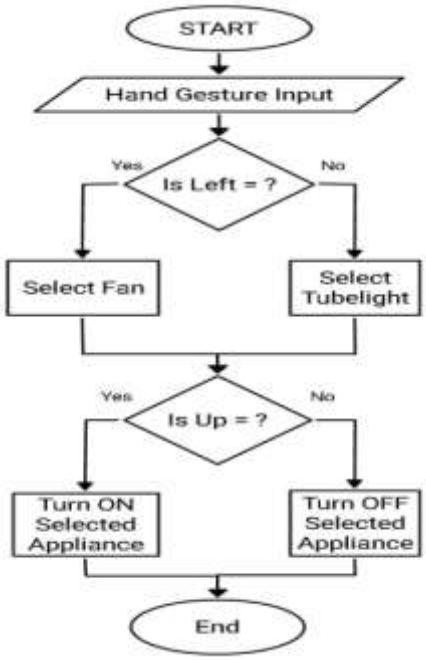

FIGURE 3: Flowchart for Hand Gesture

Fig.3. shows the flow of the hand gesture system. Firstly the gesture is recognized using the gesture sensor. The program has the specific values set for every gesture. The gesture is then detected whether it is left or right. This gesture is used for selection of the appliances. Once the appliances are selected, the up gesture is used for turning ON the appliances while the down gesture is used for turning OFF the appliances. The flowchart of the Voice recognition system is shown in Fig 4. Android application is built in according to the system requirement. Firstly the Bluetooth client is selected from the list. Once the client is selected, voice recognition process starts. An error message is displayed for no connection. After that the voice command is given and voice is converted into text by Android application. Instructions are transmitted to Bluetooth module and then it is given to serial input of Arduino Uno. Instructions are matched and appliances are turned ON/OFF whereas an error message of Application not found is displayed when the matching is not found.

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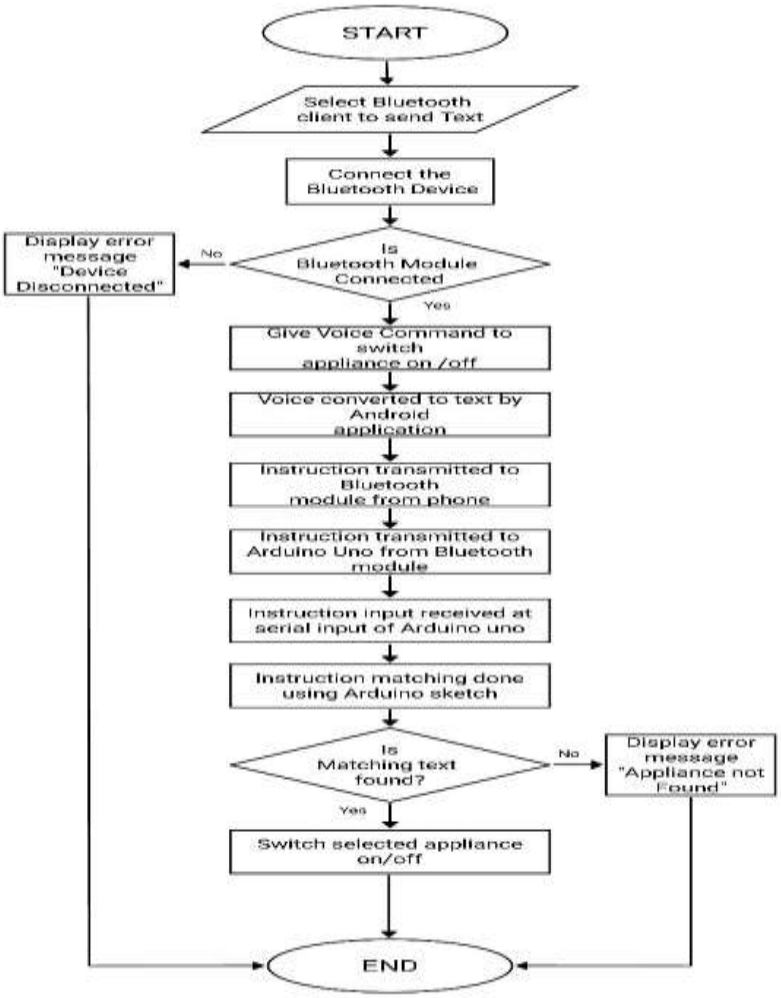

FIGURE 4: Flowchart for voice recognition

IV. RESULT

FIGURE 5: Screenshots of mobile application

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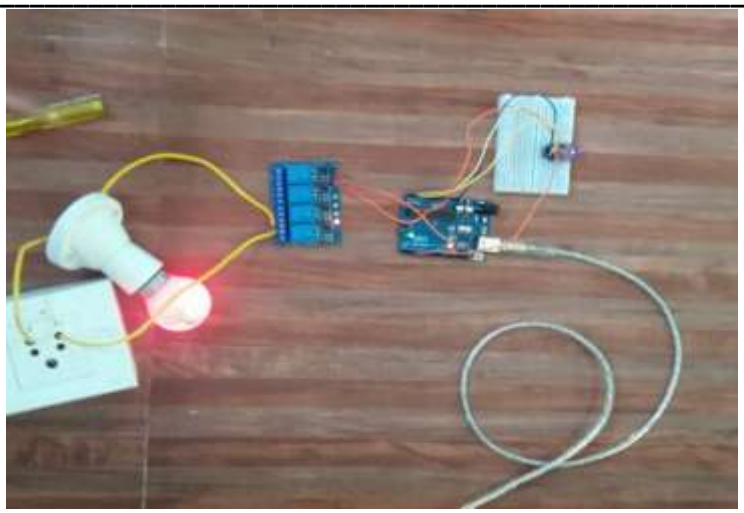

FIGURE 6:Hand Gesture Output

V. CONCLUSION

In this framework, we have exhibited the plan and execution of a Home mechanization framework constrained by hand signals. The arrangement of motions utilized in the gestural interface was chosen after a careful report. While utilizing voice directions, care must be taken to have a commotion free condition. This framework functions admirably in the scope of 20m, as it is the range for the Bluetooth. This framework was focused for the older, physically tested and for the comfort of controlling the switches without really going after it. This framework has the degree for alterations, and more gadgets can be included.

REFERENCES

[1]. Sushant Kumar, et al. "Voice and Touch Control Home Automation", 3rd Int'l Conf. on Recent Advances in Information Technology, IEEE,2016

[2]. K. Shrinivasan, et al. "Gesture Based Home Automation System", International Conference on Nextgen Electronic Technologies, IEEE, 2017

[3]. M.B.Othman, et al. "Voice Control of Home Appliances using Android", Electrical Power, Electronics, Communications, Controls, and Informatics Seminar (EECCIS), IEEE, 2014

[4]. Pomboza-Junez , et al. Gonzalo, "Control of Home Devices based on Hand Gestures", IEEE 5th International Conference on Consumer Electronics Berlin, 2015

[5]. J.Neelima, et al. "Voice Control Based Home Appliances Using Android Devices On Arduino", International Journals Of Electrical and Electronics Engineering(IJEEE), June 2017

[6]. Rakesh Dhotre, et al. "Gesture Controlled Home Automaton", International Journal of Scientific a& Engineering Research(IJSER), September 2017

[7]. Jyoti Jadhav, et al. "Hand Gesture Based Home Appliances Control System", International Research Journal of Engineering & Technology(IJRET), May 2017

[8]. Rahul Ambalkar, et a.l "A Review paper on Smart Home Using Voice Recognition", National Conference Recent Inventions in Science & Engineering(NC-RISE),2017

[9].Chandrashekhar Tyagi, et al. "Home Automation Using Voice Recognition and Arduino", International Journal of Recent Trends in Engineering & Research(IJRTER), 2016

[10]. Sonali Sen, et al. "Design of Intelligent Voice Controlled Home Automation System", International Journal of Computer Applications(IJCA), July 2015

[11].Amit Das, et al. "Gesture Controlled Home Automation", International Journal of Emerging Engineering Research and Technology, August 2015

[12]. Anjana Nair, et al. "Hand Gesture Based Home Automaton", International Journal of Advance Research in Electrical, Electronics and Instrumentation Engineering (IJAR- EEIE), March 2017