iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 5 **Issue:** XI **Month of publication:** November 2017

DOI:

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor:6.887
Volume 5 Issue XI November 2017- Available at www.ijraset.com

Implementation of Smart Home System Using Wireless Technology

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Abstract: ***This paper is aimed to spell it out the technique of evaluating the execution of speech control over operating and specialized function of smart home. In recent years, home robotisation systems have seen quick changes due to advantages of various wireless systems. The explosion in neuro-scientific wireless technology has seen the introduction of many standards, especially in the industrial, scientific and medical radio strap. RF is definitely an IEEE 802.15.4 standard for data marketing communications with business and consumer devices. RF keen on applications looking low data rate, long electric battery life, and secure networking. RF has an accurate rate of 250kbits/s, best appropriate for periodic or unique data; or just one signal transmission from a sensor or an input device. The Smart Home System will be applied in existing home conditions, without the changes in the system. The mechanization concentrates on affirmation of voice demands and uses low-electric power RF cell correspondence modules notwithstanding a microcontroller. This framework is most reasonable for the elderly and the incapacitated individuals particularly the individuals who live alone and since it includes affirmation of voice; it is secure. The mechanization framework should direct all lights and power gadgets in the house or your office utilizing tone of speech commands. With this work a home computerization control framework in light of discourse distinguishing proof is composed. The framework is executed and exploratory outcomes are acquired. Catchphrases.***
Keywords: Smart Home, Wireless Technology, RF.

I. INTRODUCTION

Because of the quick advances in remote correspondence and data innovations it is currently conceivable to insert different levels of brilliance in the home.

These keen homes are ones that can collaborate brilliantly with their inhibitors to give solace and safe living. This association may go from straightforward control of encompassing temperature to setting mindful and portable operator based administrations. A case of that is conveyance of specific data content in light of the brilliant home inhibitor area inside the home and the exercises that he or she is locked in with.

Remote systems and sensors are believed to assume an inexorably imperative part as key empowering influences in rising inescapable processing advancements that are required for the acknowledgment of keen homes. The far reaching of remote systems in our day by day life is empowered by the correspondence gauges, for example, Wi-Fi, Bluetooth, Zigbee, Radio Frequency Identification (RFID), and cell innovations. A mix of these models is conceived to be utilized to build the brilliant home.

Viably all remote advancements that can bolster some type of remote information exchange, detecting and control are possibility for consideration in the shrewd home port. It incorporates a server/passage/switch that can be utilized as the essential issue of availability for gadgets inside the home and in addition permitting network to the outside world. The setup incorporates savvy sensors and machines that have either wired or remote network.

Speaking with the keen home from the outside should be possible utilizing one or a blend of the accompanying outer systems, for example, telephone lines, XDSL lines, link of (TV), Global System Mobile (GSM), and electrical cable systems. 2. Shrewd home Smart homes are no longer outline ideas without bounds. They are being manufactured now, and they are directly affecting the ways of life of individuals living in them.

Astutely outlined and worked structures yield emotional increments in laborer profitability, vitality cost reserve funds and authoritative investment funds [1]. Shrewd Home is the term normally used to characterize home or building, furnished with extraordinary framework that does some smart activation as indicated by circumstance. Joining of the home frameworks permits them to speak with each other through the home controller in pre-modified situations or working modes.

For instance, when a man ways to deal with the outside entryway, framework perceives the individual's character and chooses whether open the entryway or not. This is one activation case about brilliant houses. We call these sorts of frameworks as "Setting Aware Systems" that know about where the individual is and settle on choices about what incitation ought to be finished these keen home frameworks are utilized to make less demanding of individuals' day by day life, particularly individuals' crippled [2]. Savvy homes can likewise be utilized to bolster handicapped individuals, giving protected, secure and enabling conditions. The framework can permit the client to control many elements or robotize them.

Nature can likewise be observed by the brilliant home framework to guarantee wellbeing and ready individuals when there is some perilous circumstance. Its outline a brilliant home control framework which permits individuals control their home gadgets by voice order at home. This is a remote, voice control framework. Individuals could control every one of the offices at home including lights, fans or even back ground music.

At this moment, the fundamental capacity of lights control, fan control and music control has all been executed. With the exception of essential turning on and off of offices at home, additionally understand the capacity of settled time control, and blunder identification when some gadget is broken. The framework is sufficiently speedy for react every one of the charges [3]. Savvy home framework is a recreation item for the future life.

The motivation behind it is to make individuals' lives more helpful. To supplant turn on or kill on switches by hand for current item, the framework is controlled by voice. That ought to be a pattern for the future 10 years which we trust that it is coming to genuine item soon.

The most effective method to make individuals' life more advantageous, more agreeable, and more secure and how to spare more vitality will be the arrangement of inquiries will mind talk about and configuration in venture [3].

II. SYSTEM SOFTWARE CONSIDERATION

Programming Design incorporates Voice Recognition Application and RF correspondence .The voice charges are prepared and on the Easy VR2.0 voice acknowledgment unit utilizing the product named "Simple VR Commander".

A depiction of this product is appeared in Figure 1. It gives an alternative of entering any custom voice summon and after that preparation the module to perceive the order wrote. Additionally, that voice order can be tried for precise acknowledgment by saying it in the amplifier and after that the product shows the summon talked on the screen. This product likewise has an element of creating an ARDUINO-construct code depending in light of the quantity of voice summons prepared, which is perfect with "Energia".

Here, the product "Energia" is utilized to program the Arduino UNO advancement board, which contains the Atmega328-IC.

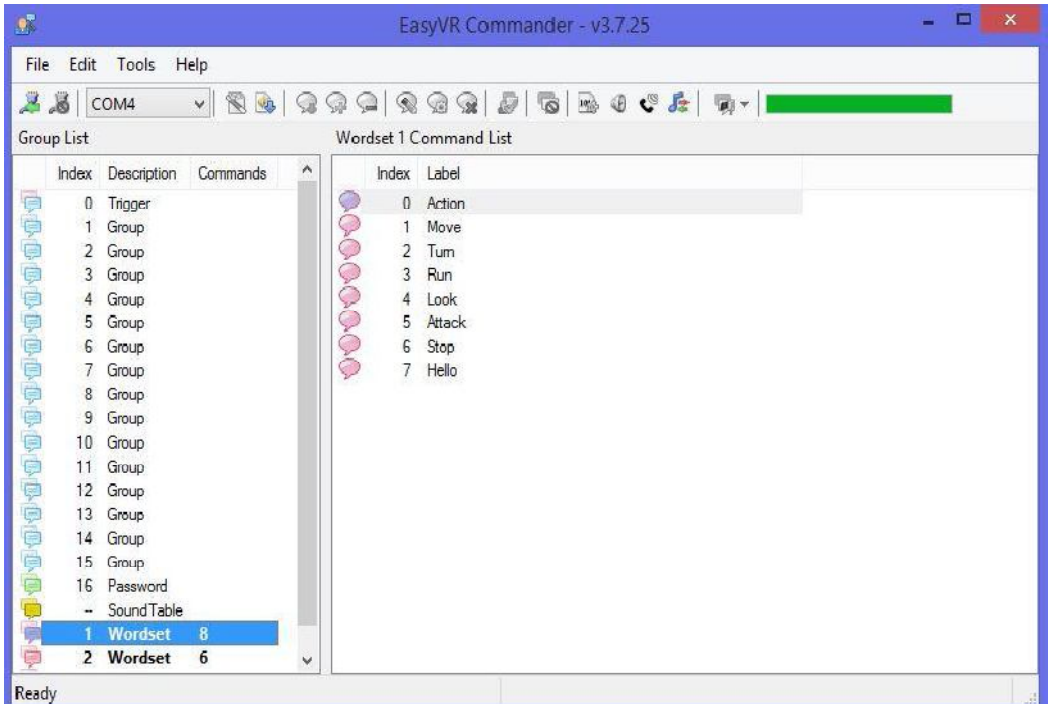

Figure 1: Easy VR Commander used for training voice commands.

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III. SYSTEM HARDWARE CONSIDERATION

There are two microcontrollers in this venture. Remote correspondence is set up by two RF chips. One of them is associated with the firstATmega328 functioning as the transmitter to transmit the flag and the other one is associated with the second ATmega16 filling in as the receiver.ATmega328 is picked at the transmitter part in light of the fact that the Easy VR 2.0
Is most perfect with it and it has an inbuilt amplifier which can get and store voice signals from individuals.

IV. HARDWARE IMPLEMENTATION

The arrangement of exercises in the voice controlled savvy home framework is outlined in Figure 2. The framework is initiated when a client articulates the trigger word or the secret key.
Advance the client is required to state his/her name to have him-self/her-self perceived as a legitimate client of the framework. At the point when a legitimate client says a specific voice direction, the mouthpiece of the Easy VR 2.0 get sit first and afterward the ATmega328 at the transmitter gets it. By program controlling, the ATmega328will send a specific character to the transmitter RF.
At the point when the RF is empowered, it will send the comparing character to the recipient RF. The characters sent vary according to the voice directions of the client. At the point when the remote correspondence is set up effectively, it will send guidelines forATmega16. Therefore, the apparatuses can be turned ON or OFF or controlled like expanding or diminishing the speed contingent upon the control characters got. The system modules are shown in Figure 3.

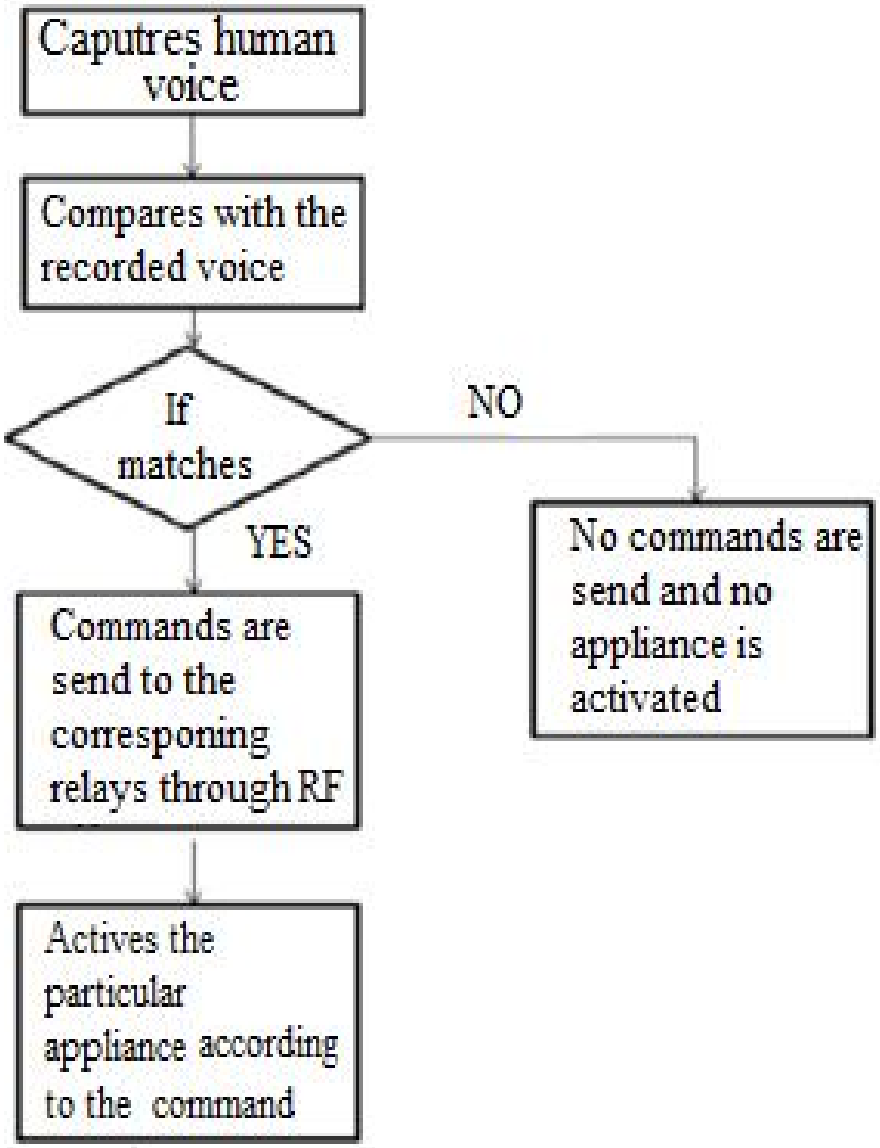

Figure 2: Sequence of activities in Voice Controlled Smart.

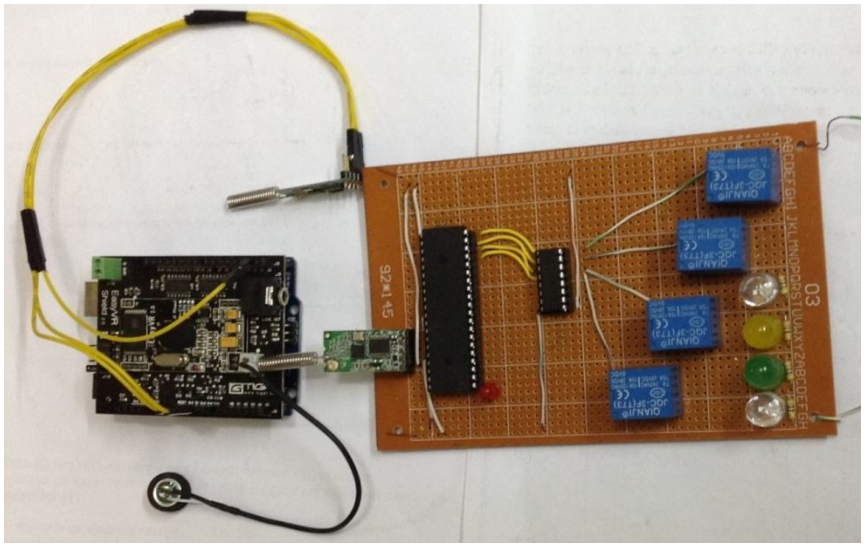

Figure 3: System Modules.

V. MODULES DESCRIPTION

In this section, the hardware descriptions of the two modules that constitute the voice control smart home system are discussed.

A. Handheld microphone module

With a RF handset and a Voice Recognition unit the segments of the receiver module are appeared in Figure 4 and Figure 5.
he human voice is caught through the mouthpiece. It is coordinated with the voice already recorded in the Easy VR 2.0. In the event that it coordinates the relating character is sent through RF. Here Easy VR 2.0 is the voice acknowledgment unit. The Easy VR 2.0 voice acknowledgment module alongside Atmega328 constitutes the Speech Recognition System. It is a simple to utilize programmable discourse acknowledgment circuit.
Programmable, as in you can prepare the words (or vocal expressions) you need the circuit to perceive. It permits you to try different things with numerous aspects of discourse acknowledgment innovation.

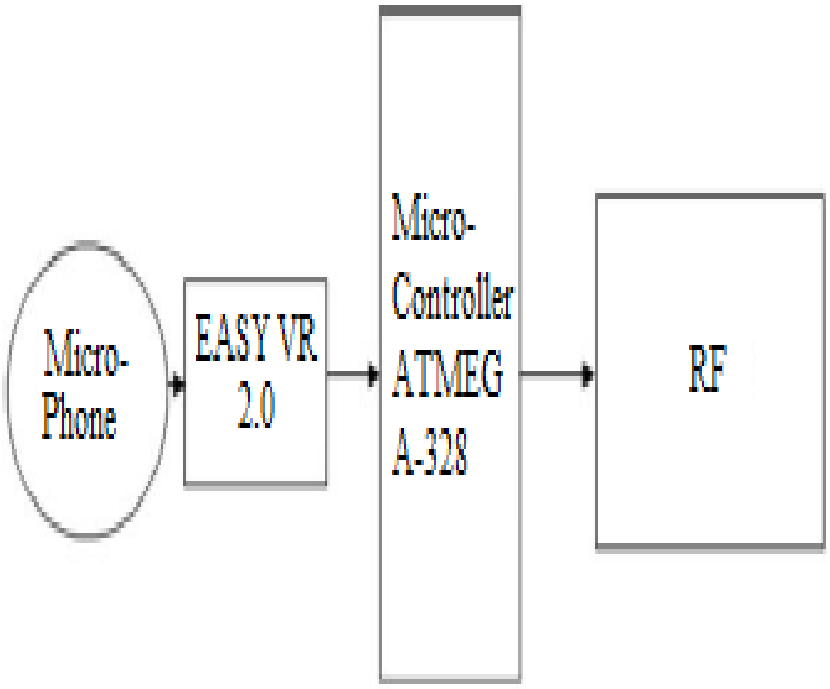

Figure 4: Voice controlled smart home system handheld.

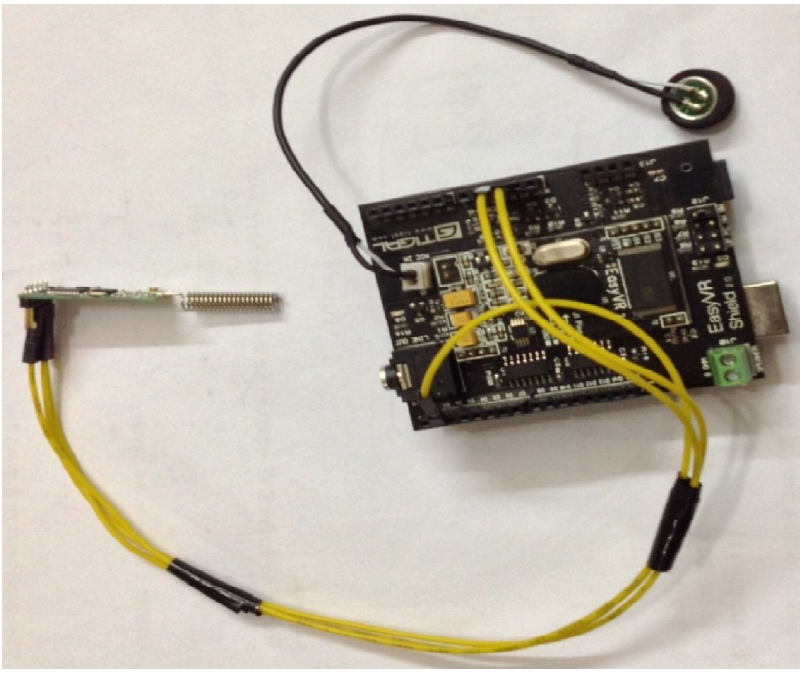

Figure 5: Voice recognition module.

B. Appliance control module

Once the speech commands are recognized control characters are sent to the specified appliance address through RF communication protocol. Each appliance that has to be controlled has a relay controlling circuit. The components of appliance control module are shown in Figure 6 and Figure 7.

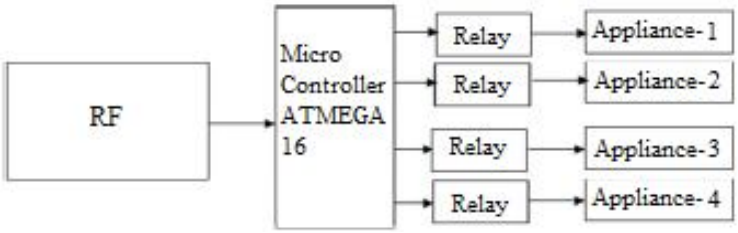

Figure 6: Appliance control module.

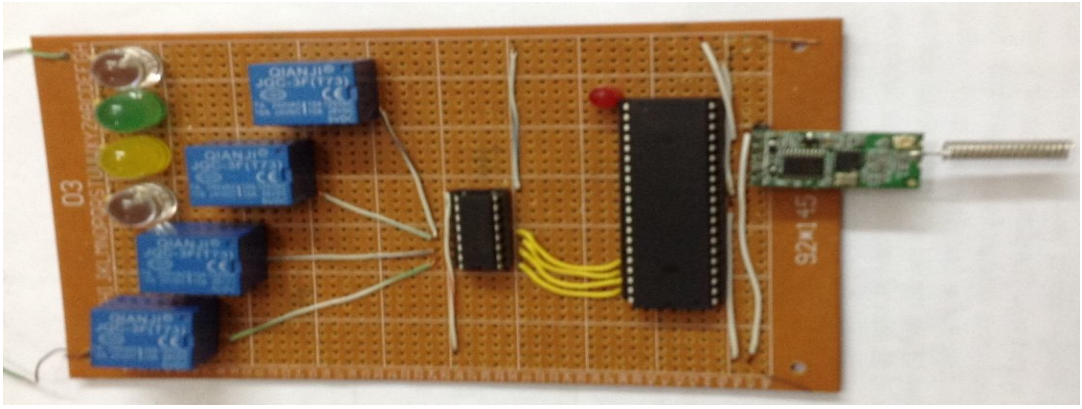

Figure 7: Microcontroller part

The basic function and instruction said by user is shows in table 4.1.

Table 1: Basic Function and instruction.

Number	Function	Command
1	Light-on	Light
2	Light-off	Turn-off
3	Fan-on	Fan
4	Fan-off	Fan-off
5	Music-on	Music
6	Music-off	Off
7	Motor-on	Motor-up
8	Motor-off	Down

VI. EXPERIMENTAL RESULTS

The experimental part is done by making repetition of chosen command. After making repetition the percent is calculated for each situation. The repetition is done for 30 times for every subject testing.

Figure 8 shows success ratio of recognition (%) for different ages to men and women. that the achievable success of voice commands represents 100 % accuracy for three commands out of 10 and 99 % accuracy for the remaining seven commands. That means that in the second scenario, out of 100 spoken commands 99 were interpreted accurately.

Figure 9 shows success ratio of recognition to different obstacles wood door, metal door, concrete wall, and mirror. The columns represent the success ration of recognition which they are calculated when repetition done for every obstacles.

Figure 10 discuss the effect of noise on voice recognition when module is used in an indoor condition without any noise or people talking. The second column represents the success ratio of recognition when there are people talks in an indoor condition. The last column shows the success ratio of recognition in an outdoor condition. since it is likely that there will never be finished quiet in the building, where the framework will be introduced, trying together with the nearness of encompassing clamor was finished. The TV set and radio were ON. the capacity to perceive voice. In this test the programmable assessed unwavering quality of voice acknowledgment was fundamentally lower, mostly because of the surrounding commotion that was utilized amid this test (radio and TV). It didn't, in any case, greatly affect the real acknowledgment of the voice summon.

Likewise the surrounding clamor could resemble individuals talks, auto commotion, wind and so forth.

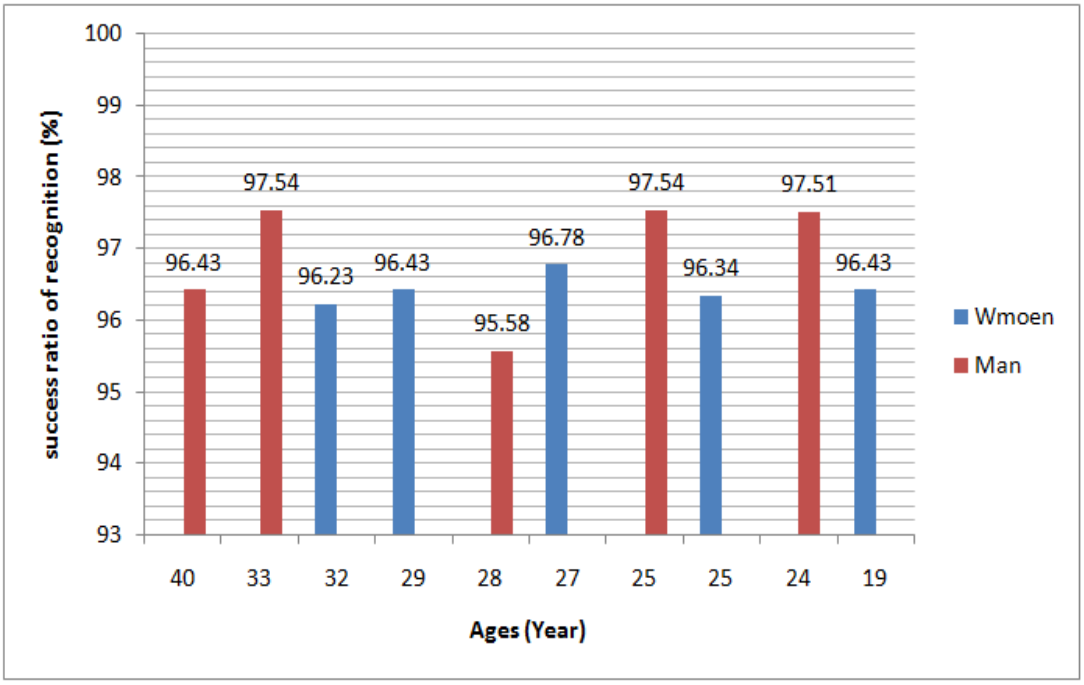

Figure 8: Different ages for both men and women.

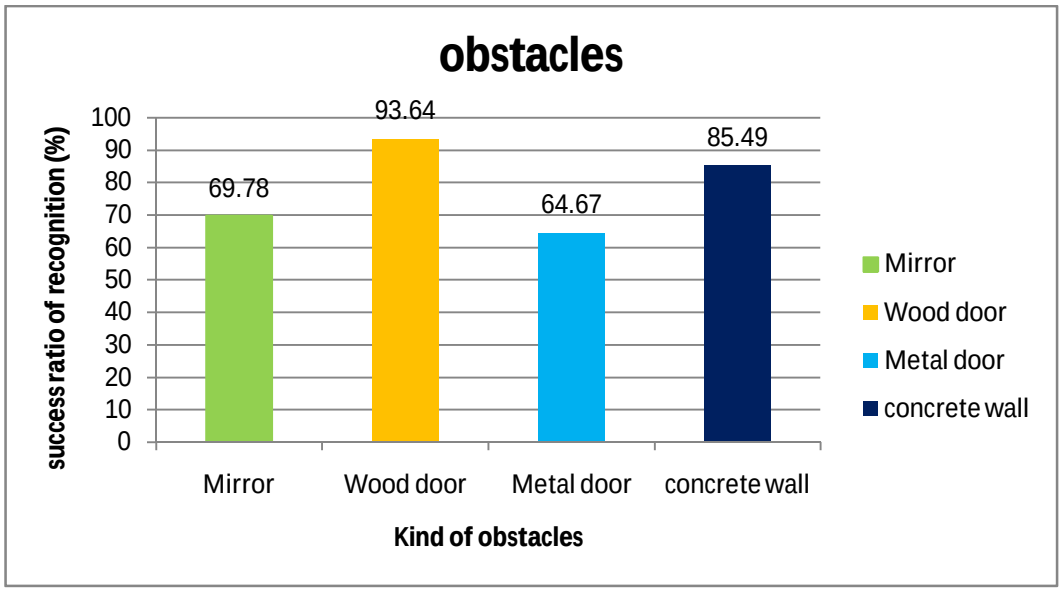

Figure 9: Different obstacles.

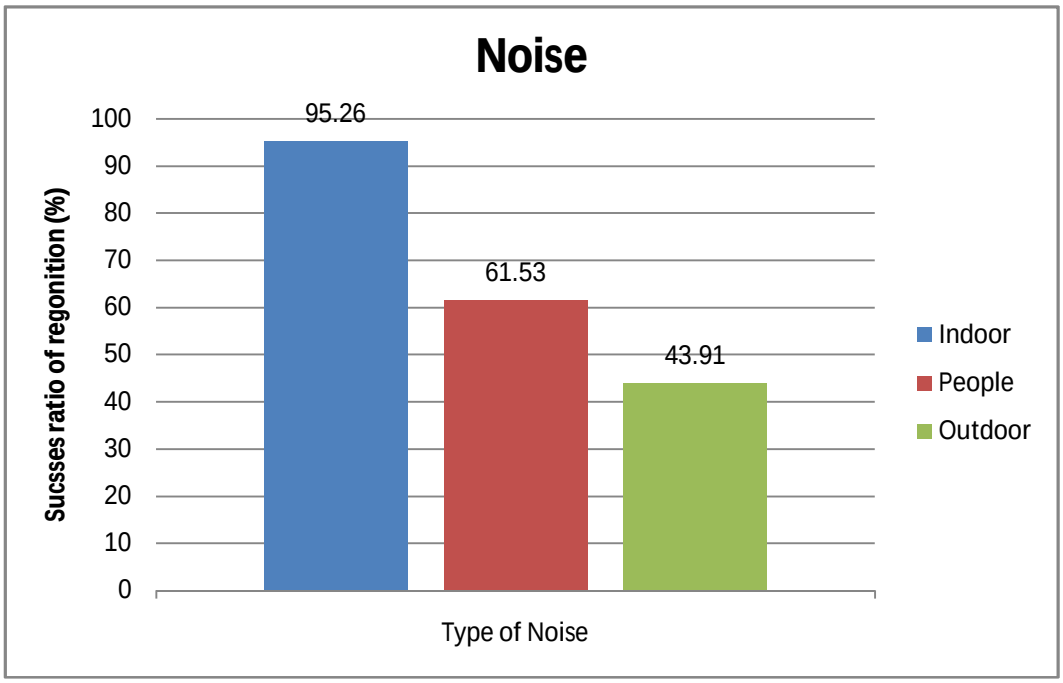

Figure 10: Different types of noise.

IV. CONCLUSION

This review was motivated from the issues that debilitated individuals experience in their regular daily existence while a large portion of other individuals don't know about their challenges. One of the greatest needs required for handicapped individuals is to proceed with their day by day life exercises when they are distant from everyone else at home and there is no one to help them.

There are many learns about savvy houses however we watched that there is no enough keen home framework that means to help handicapped individuals. A home computerization framework in view of voice acknowledgment is constructed and executed. The framework is focused at elderly and impaired individuals. The proto sort created can control electrical gadgets in a home or an office. The framework executes voice acknowledgment utilizing Easy VR 2.0 shield.

Remote correspondence is set up utilizing RF modules on account of their productivity and low power utilization. The preparatory test outcomes are promising.

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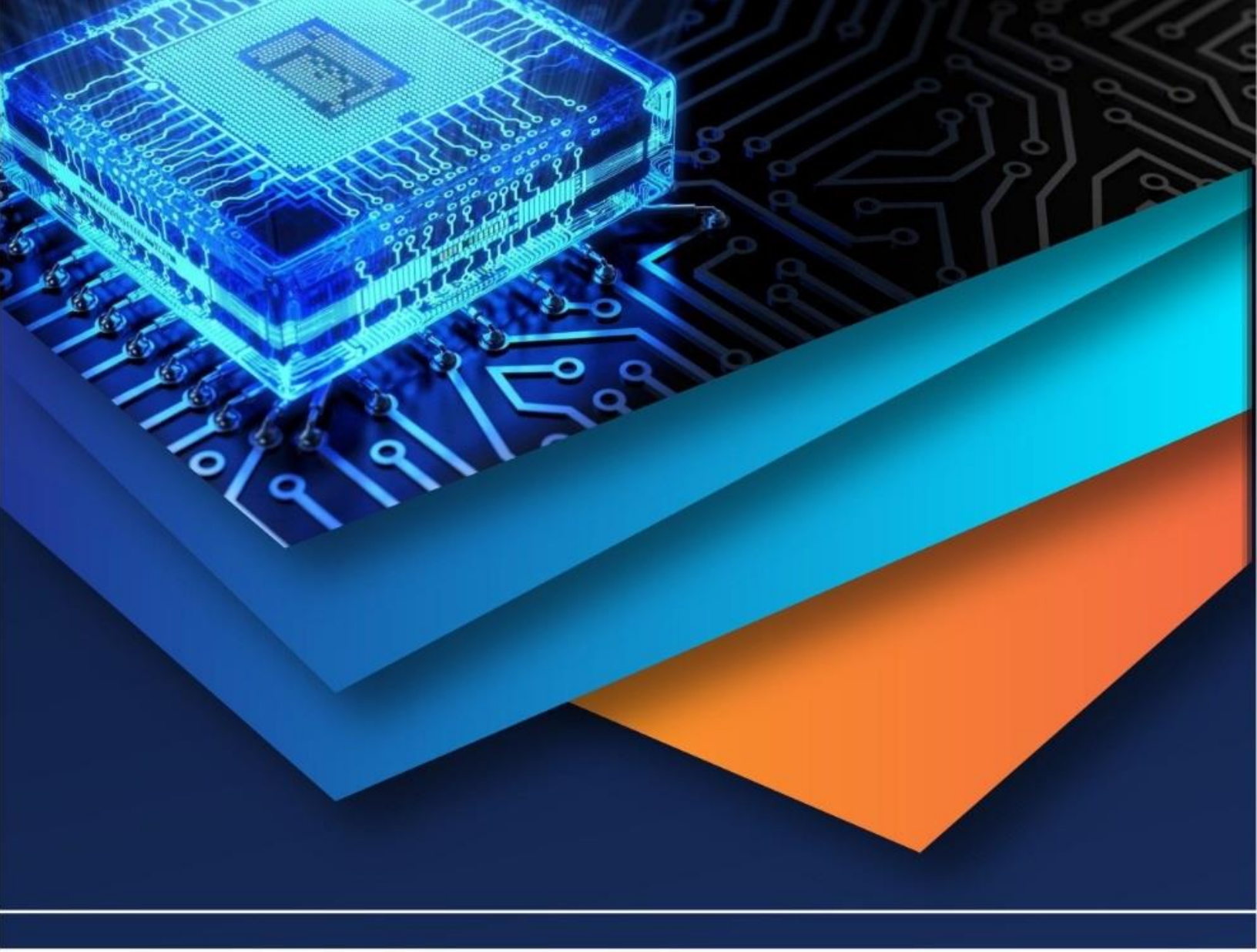

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