

# DIGITAL ASSISTANCE FOR PHYSICALLY DISABLED PEOPLE BASED ON VOICE CONTROL SYSTEM

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**Abstract:** Controlling home appliances through application is a vital one. Home Appliances Controlling using Bluetooth project is a fine combination of Android mobile technology and embedded system. The user can control Home appliances using Android mobile. An Android application should be installed on his/her Android mobile handset to control various home appliances. The user can send commands using that application. This project consists of a Bluetooth receiver. This Bluetooth device is connected to the circuit which has a decoder. This decoder sends a code for the respective command sent by the user. Then the respective device connected to the circuit will be turned on or off depending on the command given. At the output side of Home Appliances Controlling using Android Mobile via Bluetooth, we have connected 5 relays and a buzzer.

## INTRODUCTION

In olden days people used to control their appliances manually. But due to advent of technology situation has changed rapidly. In these days everyone are using Smartphone for their personal use and fun purpose. In general most conveniently used device is cell phone. So controlling home appliances from an android

application is not a cost effective. 10 years prior controlling appliances wirelessly would have cost us more. But these days that's not the case. We can easily control the appliances by using commands. Today most of the people using android mobile system [1]. All mobile supports the android OS. We can easily process the voice information in android. Because it is Linux based OS. Here we used arduino mega 2560, but any arduino development board can be used. The HC05 is a Bluetooth module is a major part of our model. The Bluetooth is used to receive a command from bluetalk command. The bluetalk is an android application. For developing android application, MIT app Inventor is used. This application is available on all play stores.[2]

In the coming days, IoT is playing a very important role in each individual's life and lifestyle. IoT has made mans work convenient and simpler. Everything around us can be controlled with a click and the control lies under the fingertip of a man. Just a click has got the ability of performing a huge set of actions. Through home automation every device of the house such as light, fan, fridge, etc. can be remotely accessed and controlled from any PC, mobile or laptop. This drastically decreases the

energy consumption and enhances the indoor safety as well as provides a better environment to live in. One of the major growing industries that can change the way people live is Home Automation. The targets of home automation system are the ones who seek luxurious and sophisticated homes and elderly and disabled people who seek dependency most of times. A wireless home automation system allows humans to control household devices from a centralized control unit such as laptops or mobile devices. This allows users to wirelessly control lights, fans and other electronic devices by integrating it as a single portable unit. The WiFi signals that are emitted by the appliances are interacted with the help of a mobile application. Instructions are sent out to the board by the application. Any command sent from a remote place, is received by the appliances by a Wi-Fi. All devices are becoming smarter day by day.

IoT helps in transferring the data from sensors through wireless network, thus achieving informational exchange in the computing network. Objects like electronics devices, sensors, home appliances are connected to a wireless network. Internet of Things is a wireless network of these objects. They exchange data through light weight protocols like MQTT, CoAP etc. There are so many types of radio modules. The common ones are GSM, WiFi, Bluetooth, ZigBee, etc. However, owing to the surging number of WiFi hotspots and range sufficient to perform the required control and monitoring, WiFi is chosen as the mode of communication in the prototype and the devices are controlled through IFTTT implemented using ESP8266. The devices connected to the Raspberry Pi are controlled by giving commands through user interface. Security is a major functionality of IoT. Hence, users are

authenticated through user ids and passwords.

## RELATED WORK

IoT has received much attention from scientists, industry and governments all over the world for its potentiality in bringing about a change modern day living[3]. IoT is envisioned as billions of sensors connected to the internet through wireless and other communication technologies. The sensors would generate large amount of data which needs to be analyzed, interpreted and utilized [4]. Home Automation System utilizes the Internet of Things for monitoring and controlling the electrical and electronic appliances at home remotely by simply using Smartphone [5]. Implementation of a low cost, flexible home automation system is presented. It enhances the use of wireless communication which provides the user with remote control of various electronic and electrical appliances [6]. Other home automation systems insist on using Arduino board boards as the only solution. Most of these systems can also be replaced by ZigBee, Raspberry Pi or any other programmable board as their functionalities are not altered. These systems also have a heavy reliance towards using mobile device as their central console alone, giving very less flexibility of changing this. This is a concern for the user, because most of the time.

Mobile devices are carried along with the user everywhere they go rather than statically staying in the house. They also do not support voice commands from the user [7]. Most of the other home automation systems use Bluetooth in their mobile device for implementation. This has various demerits in every aspect. Primarily the Bluetooth has a very small range and the proposed system could only work in small homes, excluding homes with larger

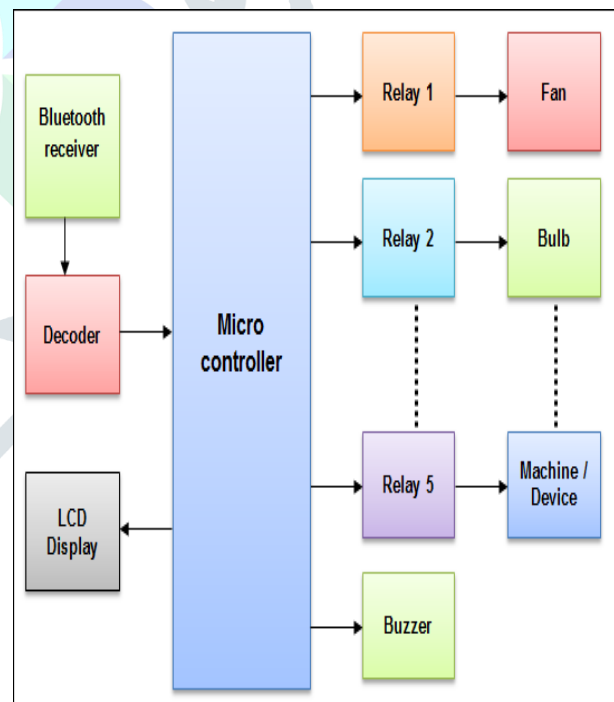
area. Bluetooth does not support remote operations, (i.e.) the appliances cannot be controlled by Bluetooth from a remote geographical. Many appliances within the same range may pick up the commands given to particular device resulting in erroneous behavior [8]. The purpose of this paper [8] is to use a mobile app to control electronic devices. It is also useful to save electricity and determine the cost of electricity that is used in each device so that the optimization can be achieved.

Monitoring and remote control of domestic equipment based on IoT from an Android application using Raspberry pi card is possible [9]. The main objective here is to automate all the devices i.e. home appliances through internet using Raspberry Pi, as well as we can have the security for the system by using sensors like PIR, LPG, temperature sensors. By this effective technique use of our renewable energy resources utilization is done in great extent. This paper [10] deals with the automatic control of lights or any other home appliances using internet. The proposed work is conceived in networking our mobile to various appliances via a smart logic circuit. It consists of Smart Logic Circuit connected to the appliances. Status of all home appliances can be controlled by users from remote areas with help of user's mobile phone. The various system functions supported are temperature and humidity, gas leakage detection, control appliances. The designed system in addition to monitoring the sensor data, like temperature, gas, light, motion sensors, but also actuates a process according to the requirement, for example switching on the light when it gets dark. It also stores the sensor parameters in the webpage (database) in a time specific manner. This will help

the user to analyze the condition of various parameters in the home anytime anyplace.

## IMPLEMENTATION

This project has integration of Android mobile technology and embedded system. Android mobile user has to install an application on his mobile handset to control the devices. Then he/she can give command using the buttons on that application. For this you have to turn on the Bluetooth on mobile, so the main wireless controlling technique used in this project is Bluetooth technology. Bluetooth receiver will be connected to the project. This Bluetooth device is connected to the circuit which has a decoder. It sends out a code for respective command sent by user. Then the respective device connected to the circuit will be turned on or off depending on the command given. For example: Turn on motor, Turn off motor. Turn on buzzer etc. Such that by giving commands from mobile you can control home appliances.



**Fig: Block Diagram of the project Home Appliances Controlling using Bluetooth**

It is an important project among various Wireless Communication Project Ideas. The wireless controlling technique used in this project is

Bluetooth technology. And it mainly consists of following blocks:

- 1) Android mobile with android app installed
- 2) Bluetooth receiver unit – User has to connect the device to the android mobile using Bluetooth.
- 3) Microcontroller – We have used 89s51 microcontroller in this project. However, this project can be implemented using 89c51, 89s52, 89v51RD2, PIC18F4550, AVR ATmega32 and using Arduino Uno.
- 4) LCD Display – It shows various informative messages like Project Title, Device 1 turned on/off.
- 5) Relays – 12 volt SPST relay is used in this project.
- 6) Output devices – For demonstration purpose, we have connected 2 DC devices to 2 relays (12volt DC Fan and 12 volt DC bulb). And remaining 3 relays are kept open. However, you can connect any AD/DC devices to all of these 5 relays. Also, Device 6 is represented by a Buzzer.

An Android phone is a powerful, high-tech smartphone that runs on the Android operating system (OS) developed by Google and is used by a variety of mobile phone manufacturers. Android is a mobile operating system based on a modified version of the Linux kernel and other open source software, designed primarily for touch screen mobile devices such as smart phones and tablets. Android is developed by a consortium of developers known as the Open Handset Alliance, with the main contributor and commercial marketer being Google.

A receiver such as this one can turn a pair of ordinary headphones into bluetooth capable headphones. That means they can wirelessly accept a signal from a bluetooth device. A transmitter can

turn an old stereo into a wireless streaming device. There is a good chance that your TV/receiver is not bluetooth capable.

A microcontroller (MCU for microcontroller unit) is a small computer on a single metal-oxide-semiconductor (MOS) integrated circuit chip. In modern terminology, it is similar to, but less sophisticated than, a system on a chip (SoC); a SoC may include a microcontroller as one of its components. Program memory in the form of ferroelectric RAM, NOR flash or OTP ROM is also often included on chip, as well as a small amount of RAM. Microcontrollers are designed for embedded applications, in contrast to the microprocessors used in personal computers or other general purpose applications consisting of various discrete chips.



**Fig: Microcontroller Kit**

A liquid-crystal display (LCD) is a flat panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and seven-segment displays, as in a digital clock. They use the same basic

technology, except that arbitrary images are made from a matrix of small pixels, while other displays have larger elements.

LCDs can either be normally on (positive) or off (negative), depending on the polarizer arrangement. For example, a character positive LCD with a backlight will have black lettering on a background that is the color of the backlight, and a character negative LCD will have a black background with the letters being of the same color as the backlight. Optical filters are added to white on blue LCDs to give them their characteristic appearance.



**Fig: 5V 10A 1 Channel Relay Module for Arduino**





**Fig: Android application for Home appliance control using Bluetooth**

## APPLICATIONS AND ADVANTAGES

1. Home automation – This project can be used to control various Home Appliances.
2. We can control device from a long distance, thus it gives ease of access.
3. Home Appliances controlling using Mobile is having a faster operation and is very efficient.
4. No need to carry separate remote or any other controlling unit.

## CONCLUSION

The Proposed project will give the idea for controlling appliances in the single point without manual intervention to use home appliances. The Bluetooth distance level is 100 m, if the user needs to increase the load level it can be done by simply saying the appliance name assigned to that particular appliance, and telling it to on or off.

## FUTURE ENHANCEMENT

1. We can interface sensors to Home Appliances Controlling using Android Mobile project so that it can monitor some parameters.
2. We can control devices with our voice. With some modifications, we can change this project to voice controlled home appliances so that it.
3. We can replace Bluetooth by GSM. So it will be SMS Based Home Appliance Control System.
4. We can implement this project using Arduino Uno board. Home automation using Bluetooth and Arduino will perform the same operations as this project does.

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