

# Gesture Control Bluetooth System Using Arduino Uno

Dinesh A.Gawalkar<sup>1</sup> Suraj Ade<sup>2</sup> Subham Barai<sup>3</sup> Prashant Tiwari<sup>4</sup> Avinash Ramteke<sup>5</sup>

<sup>1,2,3,4</sup>Student <sup>5</sup>Assistant Professor

<sup>1,2,3,4,5</sup>Department of Electronics and Telecommunication Engineering

<sup>1,2,3,4,5</sup>Govindrao Vanjari College of Engineering, Nagpur, India

**Abstract** — The objective of the project was to create a gesture-controlled bluetooth speaker that responds to user inputs to control music playback on a bluetooth device. Supported playback commands include pausing and resuming of music, changing of volume, skipping forward a song, and returning to the previous song. The speaker uses an LED strip which outputs different patterns, colors and intensities of light to display the type of gesture that the speaker recognizes. The music industry has been completely transformed by Bluetooth technology. For music enthusiasts, Bluetooth has made life simple with speakers and headphones. Their compact size portability and long battery life have made them a center of attraction. Well, we hereby take Bluetooth speakers to the next level by integrating touchless operation. The Bluetooth speaker allows users to change music by just swiping their hands over the Bluetooth speaker. Also, the speaker allows users to adjust the volume by just raising and lowering their hand over the speaker. The user can thus operate the complete speaker operation without even having to touch his/her phone or the speaker.

**Keywords:** Gesture Control Bluetooth System, Arduino Uno

## I. INTRODUCTION

Today, nearly everyone has bluetooth-enabled devices that carry their music wherever they go. While many people often bring a set of headphones to listen to their music, it's always nice to share it with more people via a nice bluetooth speaker. For many college students, a portable, stylish bluetooth speaker is an essential item in the dorm. The Bluetooth speakers are most popularly used nowadays. It's portability with compact size and life of battery. This can be modernized Bluetooth speakers by integrating contact less operation using arduino. It allows user to change the music by swiping the user hand over the Bluetooth speaker. It also allows the user to adjust the volume by raising and lowering their hand over the speaker. This device as a prototype module use 6 watt speaker with sub-woofer along with arduino, battery charging board, lidar sensor, audio amplifier IC, Bluetooth module and battery set. The system uses Bluetooth module to allow phones to connect to the speaker for audio input. The speaker also allows for an AUX connection for audio input and a separate charging input connector for battery charging. The lidar sensor is mounted on the front of Bluetooth speaker. The input from sensor is processed by Arduino and passes to the controller to increase or decrease volume, changes song or turn on the speaker. The battery power is controlled by the charger of battery and protection circuitry.

## II. LITERATURE SURVEY

### A. Home Automation:

Gesture-based home automation can be achieved by using cameras in existing devices, adding ultra-Sonics sensors or electrodes, but these methods have 2019, I limitation of

distance, and complicated image processing but can overcome by using wearable tech like a glove or wrist bands. Abhijit M., Anjana Nair, Jikhil John, Shabasbasheer, Munna Basil Mathai has developed [1]GESTO a hand glove equipped with accelerometer and gyroscope sensor is used for gesture controlled system. In this system there is a transmitting section and receiving section. [4] The transmitting section of accelerometer and gyroscope which senses the title of the hand, sense the acceleration of movement by the hand, this gesture are converted into data with help of micro-controller which is then transmitted over RF transmitter to the receiving section received by the RF receiver. RF decoder decodes the data through the micro-controller which transfers to relay whose output have respective devices connected like TV, DVD player, computer, etc. which are controlled through the gesture. This system provides easy operation and help the disabled and aged people. This system can be improved by adding an IR transmitter for the purpose of controlling [7] IR application through gestures. Implicating IR sensor with this glove technology will add more to its application and impact factor. [B] Gaming: This sector is gaining greater attention and gesture controlled gaming is the new trend in this industry. Microsoft and Sony have implemented gesture gaming in their platform PS4 and Xbox 360. The Xbox 360 has a kinetic sensor which consist of depth, color sensing cameras and IR sensor which altogether forms the kinetic sensor which can be used for gaming. Whereas PS4 not only use 3D depth sensing cameras but also accelerometer and gyro –scope Sticks for more playing options and gesture. Image processing is complicated and adds more cost to the system, if accelerometer and gyroscope sensor programmed effectively the 3D sensor camera can be avoided but may lead to certain limitation. Dr. Parameshachari B D, Rubeena Muheeb, Nagashree R N, ,Deekshith B N, Keerthikumar M, Rashmi P, Rachana R illustrated the use of Microsoft kinetic sensor [2], Microsoft kinetic sensor can be used for developing our own set of instructions for games through its SDK environment tool. This tool tracks 20 points in our body each point combination resulting into an index value that scan be programmed for game controls. [3] A.D whitehead.

### III. MYTHOLOGY

#### A. Hardware Component:

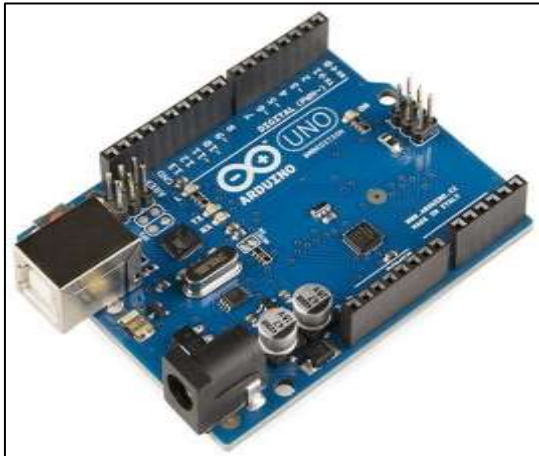


Fig. 1:

Arduino uno Module: The flex sensor outputs which is given to the ADC of the Arduino module is in analog structure. The ADC change that simple into computerized structure. Fig 2:- UNO Arduino → LCD: A 16\*2 LCD (Liquid Crystal Display) screen has a presentation of 16 characters in each line and in this manner have 2 such lines. Mostly each character is shown in 5\*7pixel configuration. It contains two registers in particular an data register to store the information to be show and order register to store the direction guidelines. Fig 3:- LCD → Bluetooth device: A Bluetooth device is Bluetooth SPP port. This device has 2.40 Ghz transceiver and

#### B. LCD DISPLAY

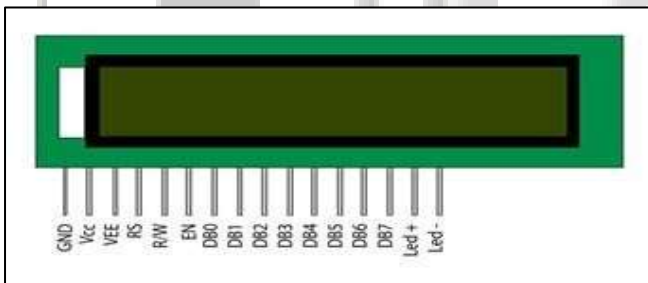


Fig. 2: LCD Display

16x2 LCD display is a name because it has 16 columns and 2 row also it can display 16 characters per line LCD (Liquid Crystal Display) is a electronic device it use to display the data it can display 32 character every character made 5x8 pixel dots so total pixel can be calculated as 32x40 the screen is an electronic display module. A 16x2 LCD display is depend on the multi segment LEDs the basic module is very commonly used in various devices the pin out of LCD display. the two power pins VCC and VSS the VSS is connected to the ground and VCC connected to the 5v we have eight data pins which used to send information The LCDs are economical; easily programmable; have no limitation of displaying special & even custom character A 16x2 LCD This LCD has two registers, namely, Command and Data [4]. The command register is stores the command instructions given to the LCD display. A command instruction given to LCD to doing predefined task like a initializing, clearing its screen, setting the cursor position, controlling displayetc. The data register is stores the data to be displayed on the LCD display. The data

is ASCII value of the character to be displayed on the LCD screen. The two black circle back side of LCD these two black circle consist an interface IC and its associate component to help us use the LCD.

#### C. Ultrasonic Sensor



Fig. 3: Ultrasonic Sensor

Arduino Uno is a microcontroller based on the ATmega328P according to datasheet. It has 14 digital input and output PWM pins which 6 pins can be used as outputs pins and 6 pins can be used as analog inputs pins, a 16 MHz oscillator crystal, a type ( C )USB jack, a 12th volt power jack, an ICSP header and a reset switch.in the board that reset hole board take the running program in initial stage this switch is very useful when boar is hangs this pin will clear everything in the program and start the program from beginning an flash memory of the controller is 32 KB of which 0.5 KB used for the bootloader. Arduino UNO it can be programmed using C language and C++ language. Controller port are need to support the controller; simply is connected to the computer with a USB cable or power cable with an AC-to-DC adapter or battery to get controller started. The worst case is that you would have to replace the controller and start again. an the atmega328 microcontroller is place on the board this board come with built in regulation feature keeps the voltage under control when the Device is connected to the external device

### IV. ADVANTAGE

- 1) High-quality audio with a strong bass
- 2) Full Contactless Usage
- 3) To change to the next song, swipe your hand
- 4) Changing the volume by raising or lowering the hand
- 5) Battery life of more than 8 hours
- 6) Portable, lightweight, and compact device
- 7) Swiping hand to turn On the speaker
- 8) Automatic turn Off when not in use

### V. FUTURE SCOPE

As we know Arduino is a free software and hardware platform that helps you to build your own electronic devices. It is a great tool to help you build a gesture control speaker using Arduino. Gesture control allows you to control your speaker without touching it. The technology is still in development, but the potential applications are huge. The future scope for this Bluetooth speaker is huge. It can be enhanced with numerous features. For example, you can add a facility for answering and receiving calls. You can also add an FM radio module along with an audio jack and so on. You can also use it as a mini laptop. For this, you need to use a

mini laptop with an additional ported keyboard and a touchpad. The Bluetooth speaker itself can be used as a touchpad. Moreover, by using Arduino. For this, I shall have to use a PIR sensor to activate the speaker. This will be quite handy as it can be used as a security system and the speaker turns off automatically when someone enters the room.

## VI. CONCLUSION

Gesture controlled system has a greater growth in leading industries. Considering hardware requirement, research, weight, and size, the module can be manufactured as smart wrist band. This will help the disabled and aged group people to easy their lifestyle. Opening a whole new platform for gaming and device controlling. A whole new gesture controlled Universal remote.

## VII. RESULT

We were able to meet all but one goal outlined in the description; while the speaker performs every functionality we planned to implement perfectly, we did not take into account the fact that human hands have gaps between the fingers. Thus, while the gestures are acknowledged perfectly when using a piece of paper or cardboard, using a human hand turned out to be slightly less reliable. While this was quite an unfortunate limitation - especially considering that this was meant to be a "hand-gesture controlled speaker" - we think that this is not a very hard problem to fix.

The performance related to bluetooth-streaming was pleasantly surprising. We noticed barely any delay between the hand gesture and the playback control, which requires signals from RELAY1 to be sent through 5 GPIO pins to RELAY2, which then sends controls via bluetooth to our device. The audio did not cut out and could be played from significant distances, despite the fact that RELAY2 was enclosed in the speaker case.

## REFERENCES

- [1] Abhijit M., Anjana Nair, Jikhil John, Shabasbasheer, Munna Basil Mathai – 2017, Hand Gesture Based Home Automation, International Journal of Advance Research in Electrical, Electronics and instrumentation Engineering (IJAREEIE) Vol. 6, Issue 3.
- [2] Dr. Parameshchhari B D, Rubeena Muheeb, Nagashree R N, ,Deekshith B N, Keerthikumar M, Rashmi P, Rachana R-Design of an Gesture Recognition Based Car Gaming International Journal of Advanced Networking & Applications (IJANA)
- [3] A.D whitehead, Gesture Recognition with Accelerometers for Game Controllers, Phones and Wearables, GSTF International journal on computing (JoC) Vol.3 No.4, April 2014
- [4] Apoorva Bharambe, Divya Chaneka, Divya Naik, Prof. A. B. Vitekar, Automatic Hand Gesture Based Remote Control for Home Appliances Apoorva, February 2015, Vol 5, Issue 3.
- [5] Mohankumar, Kumudini G, Meghana K Niveditha, Bhat Prathibha C. Virtual Reality Based Human Mouse IJSRD - International Journal for Scientific Research & Development| Vol. 7, Issue 03, 2019
- [6] Aayushi Gautam, Divya Bareja, Sukhbani Kaur Viridi, Sushant Shekar and Gaurav Verma Implementaion of High Performance Home Automation using Arduino Indian Journal of Science and Technology , June 2016
- [7] Rohith H R, Shiva Gowtham, Sharath Chandra A S, Hand Gesture Recognition In Real Time Using IR Sensor, International Journal of Pure and Applied Mathematics.