# GESTURE CONTROLLED GLOVES FOR GAMING AND POWER POINT PRESENTATION CONTROL

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*Abstract—Computer and its application plays a major role in Human life nowadays. Yet, the smartness to handle it is still on growth. The main aim of the project is to control gaming as well as the slides of a presentation using simple hand gestures. The user needs to wear a gloves or a gesture device which includes a sensor. The sensor will record the movements of the hands which will control the PC in the manner we want. The PC and the gesture device communicate through Zigbee transmission and reception. The wireless communication enables the user to control the PC from a distance in more easy way. This paper gives a wide information on the hand gesture technology and its effectiveness for humans both in present and in the future. It broadcast about the wireless Zigbee transceiver and its applications. Because of the increasing need in the human – machine Interaction system, these kind of cost effective applications will greatly reduce the man power as well as pay a way for sophisticated life of humans.*

**Keywords**—slides, PPT, gaming, Zigbee Transceiver, wireless transmission, flex sensor, microcontroller

## 1. INTRODUCTION

MS Power point is a very important part of our professional and student life. We face several problems while giving the presentation or seminar like we need an operator like mouse, remote etc., will create problems if not operated well. To overcome it, we made the gesture device which can be connected to computer operated by speaker's gesture wirelessly from a long distance also. Computer applications require interaction between human and computer. This interaction needs to be unrestricted and it made challengeable accounts as compared to traditional input devices such as keyboard, mouse, pen etc. Hand gestures are used in daily life while communication. Gaming is an important entertainment among children. But it has own side effects of affecting the eyes when operated in a closer distance. Hence, these kind of gesture devices will help children to play games from a safer distance. They are also more natural in interaction, compared with those devices mentioned above. Human computer interaction becomes easy, with use of hand as a device. Use of hand gestures to operate machine would make interaction interesting. Gesture recognition has gained a lot of importance. Hand gestures are used to control various applications like VLC media player, robot control, virtual mouse etc. Use of gesture makes interaction easy, convenient and does not require any extra device. Vision and audio recognition can be used together.

The research work in hand gesture recognition has been developing for more than 38 years [3]. In 1977, a system that detects the number of fingers bending using a hand glove was proposed by Zimmerman and it is been stated by [4] which then gave the most promising results.

With the development of modern technology, [5] claimed that since people tend to use hand gestures instinctively in their interaction system to convey their desires, hand gestures may play an important role in the exchange of knowledge between people and computers.

According to [6], There are many potential numbers of hand gestures; thus, a different group of gestures are used to execute their operations for each request. The quality of understanding hand gestures is also influenced by the setting (such as sun, context, length, skin colour) and hand location and movement from the machine viewpoint.

## 2. LITERATURE REVIEW

In [1], For Human – Computer Interaction (HCI), hand gestures have a wide range of applications that can ensure speed of interaction with the computer, provide a user-friendly and aesthetic experience which attracts users, provide remote non-physical contact with the device for user comfort and security, and monitor dynamic and virtual environments in a much simpler approach.

According to [2], The computer is capable of recognizing the various users and environmental factors that occur and exist around it. Having said that, hand gesture recognition is a type of perceptual computing user interface that is used in HCI to enable computers to capture and interpret hand gestures and execute commands based on a gesture understanding.

## 3. BACKGROUND INFORMATION

### A. Arduino UNO:

Arduino is a company that designs and produces single-board microcontroller and microcontroller kits for the creation of digital devices and virtual artifacts that can detect and monitor items in the physical world. The results of the venture were released as open source hardware and software operating under the GNU framework, allowing anybody to produce Arduino boards and distribute software. Arduino boards are available in pre-assembled form commercially or as do - it-yourself kits.

**Fig-1**. Arduino UNO

A number of microprocessors and controllers are used in Arduino panel models. The boards are fitted with digital and analog input / output (I / O) pins that can be interfaced with different boards for extension (shields) and other circuits. The Arduino software offers an integrated development environment (IDE) focused on the Processing language framework as well as the use of conventional developer toolchains. This microcontroller is programmed using the fundamental languages like C and C++.

*B. Flex Sensors:*

The design proprietary by the Flex Sensor is based on carbon resistive materials. The Flex Sensor achieves great shape-factor on a thin flexible substratum as a variable printed resistor. When the substratum is bent, a resistance output correlated to the bend radius is produced by the sensor. If smaller is the radius, then higher will be the resistance value. Since we can measure only the change in resistance from a flex sensor, the change in voltage must be found out. For that, the flex sensor must be connected in a voltage divider circuit.



**Fig-2**. Flex Sensor

*C. LCD Display:*

LCD is a screen of liquid crystal. Most popular among hobbyists, digital circuit and project builders are character and visual lcd's. Because their serial / parallel pins interface is specified, they can be easily interfaced with many microcontrollers. Most things we see in our everyday life are followed by lcds. They are used to display product status or to provide an input or interface any products.



**Fig-3**. LCD display

*D. Zigbee Transceiver:*

Zigbee is an IEEE 802.15.4-based standard for a set of high-level communication protocols used to build personal area networks for lightweight, low-power electronic radios, such as home automation, data collection for medical devices, and other low-power low-bandwidth uses, designed for small-scale projects involving wireless connection. Zigbee is therefore a low power, low data rate and a close proximity wireless ad hoc network.

Zigbee is usually used in low-data applications needing long battery life and safe networking (Zigbee networks are protected with 128-bit symmetric encryption keys). Zigbee has a fixed speed of 250 kbit / s, which is best suited for sporadic data transmission from a sensor or network.



**Fig-4**. Zigbee Transceiver

**4. EXPERIMENTAL SETUP**

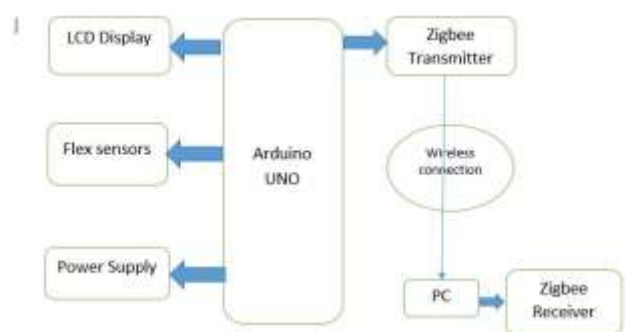The block diagram of the entire work is given in the figure below:



**Fig-5**. Block diagram representation

### A. Interfacing with Arduino:

The gloves are built in a way that it contains five flex sensors one for each finger. Those flex sensors are interfaced with the Arduino by connecting it in a voltage divider circuit.
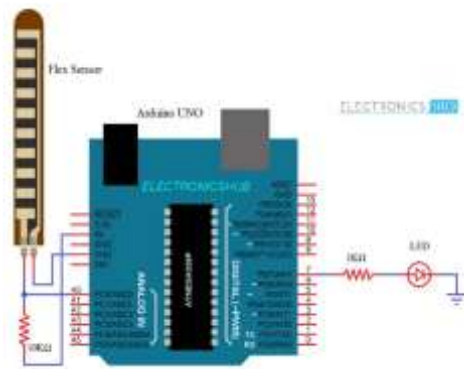


**Fig-6**.Flex sensor interfacing with Arduino

The Zigbee transmitter is connected to the Arduino and the Zigbee receiver is connected to the PC. The LCD display is also connected to the microcontroller. Finally, the microcontroller is connected to the power supply. Usually, Arduino accepts a maximum power of 5V.

### B. Working of the project:

All the flex sensors are connected to the Arduino board and their changing resistance values are displayed in the LCD display. According to the bend of the flex sensors, the different range of values are send to the microcontroller from which it is encoded into the laptop through the MATLAB software. Those data will be wirelessly transmitted from the microcontroller to the laptop, since it has been connected to the Zigbee transceiver**.** For those four values, four operations like next slide, previous slide, full screen, exit of the power point application or the gaming controls has already been coded in the MATLAB. Now, when the finger is bent, the corresponding value is received by micro controller and then wirelessly transmitted to the Zigbee receiver. The respective operation is then performed accordingly in the connected PC.

### 5. RESULT AND CONCLUSION

Finally, the gloves is all set with the flex sensor mounted on it. The gloves can be worn by the user during presentation, seminars, playing games etc., In case of changing the next slide, previous slide, full screen or exit in the power point, or moving upward, downward, left or right while playing games, the user can bend the fingers accordingly to get the desired values as such encoded in the coding.



**Fig-7.** Gesture Gloves after completion

It will be very useful for smart teaching in seminar halls, classes etc., The projector or laptop can be operated from a large distance from anywhere in the class. It reduces the use of external hardware such as mouse, remote etc.,

### 6. FUTURE WORK

In future, this gloves can be made to control several other applications of computer like music control, typing control and can be made to play more interesting virtual games which are trending nowadays. This kind of gloves can be used in medical field for surgeries. This will give a triumphant entry to the robotics field for its movement.

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