A STUDY ON CONTROLLING A COMPUTER WITH HAND GESTURE

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ABSTRACT: Hand gesture is an innovative technique of interaction between human and computer. As compared to existing techniques, hand gesture technique has the advantage of being easy to use. By using this technique the traditional way of using mouse and keyboard will be change because one can then interact with the computer with hand gestures. In this technique, ultrasonic sensor is used to classify the hand movement in real-time. Ultrasonic sensor measures the distance of hand by using sound waves. The main idea of our approach is to speed up the interaction with computer, using general purpose hardware like personal computer, Arduino UNO board and low cost sensor like ultrasonic sensor. In this way any user can easily interact with the computer using hand gestures.
KEYWORDS: Hand Gesture, ultrasonic sensor, Arduino UNO, Python

1. INTRODUCTION
ARDUINO UNO

The Arduino Uno board is based on micro-controller. Arduino Uno is an Open-Source Platform and easy to understand for beginners. A vital role in Arduino is played by its standard Connecters which lets the CPU board connect to various add on modules known as shields. Motor Controls, GPS, Ethernet, LCD, or breadboard are provided by shield. Arduino IDE (integrated development environment) is used to program Arduino boards, in C and C++ programming languages over a serial connection.

2. RELATED WORK
Hand gesture is not only limited to Gaming using basic function of computer it can be Useful for medical applications. [2] Hand gesture Technique can work as input method between [3] Medical instruments and human body as proposed. It can be used for operating each and every functions of Computer.

3. PROPOSED WORK

Gesture controlling is based on specifying hand position from the ultrasonic sensor. For processing the raw data, a micro-controller is essential; for that we use Arduino UNO board. Via USB connection the microcontroller transfers the processed and calculated distance value which is provided by the sensor.

The data which is send by the sensor is processed in the software in PC where all the calculations are performed and the data is matched with the predefined conditions (gesture resolution). In this model two ultrasonic sensors are used to detect hand position and are connected to the Arduino board.

As we know ultrasonic sensor continuously emits sound and it gets reflected back from user's hand.

The distance between the sounds is send and detection of reflect back sound wave is calculated by the micro-controller.

ADVANTAGES:

▪For this system there is no need of sound to be created so no interruption of background noise A number of functions of computer can be operated by using ultrasonic sensor.

This technique may be very useful for those who does not know functionally of computer. This technique decreases the learning time required.

Using this technique it is easy to interact with the computer and there is no language barrier.

By using this system we can control our laptop from a small distance and it can help to control laptop in conference room presentation.

Ultrasonic sensor:
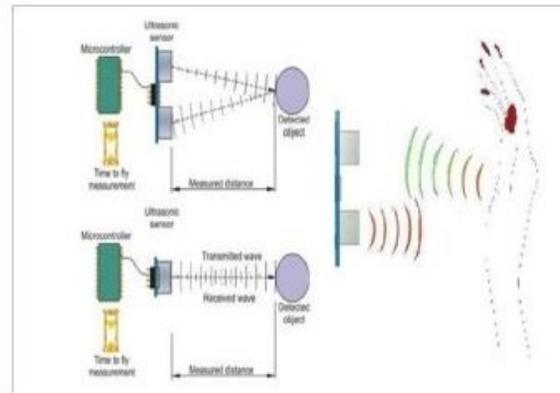
4. EXPERIMENTAL RESULTS

Hand Gesture	Output Produced by system		
	Video [VLC]	Chrome [Browser]	Slides [ppt]
Right Hand push in	**Backward**	**Backward**	**Zoom In**
Right hand push out	**Forward**	**Forward**	**Zoom Out**
Left hand push in	**Volume Increase**	**Page Up**	**Previous Page**
Left hand push out	**Volume Decrease**	**Page Down**	**Next Page**

Table 4.1 Expected Output

Figure 1.1 Output of Python code

5. CONCLUSION

This article presents one of the solutions among various others, for operating a computer using hand gestures. It is one of the easiest ways of interaction between human and computer. It is a cost effective model which is only based on Arduino UNO and ultrasonic sensor. The python IDE allows a seamless integration with Arduino UNO in order to achieve different processing and controlling methods for creating new gesture control solutions.

FUTURE SCOPE

Hand gesture technique is not only limited to gaming, using basic function of computer it can be useful for medical applications. Hand gesture technique can work as input method between medical instruments and human body as proposed. It can be used for operating each and every functions of computer.

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