Hand Gesture Controlled Mouse

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Abstract: In today's technological world we use many gadgets to get our work done in our daily life. For this we need to interact with the gadget or thing by using some interaction barriers between us and the gadgets. In today's tech world after realizing the importance of interaction there occurred many advancements in the interaction techniques like apple's SIRI, Google's assistant etc., They are based on our voice instructions. And in the next level of interaction we can interact with our gestures and communicate with the gadget we need to communicate with. In this paper   brings in a technique of interacting in which we can use our hand as a mouse i.e., we use our hand gestures to communicate with the pc as a mouse. This technique helps to interact effectively

Index Terms: Gesture, sensors, Arduino Leonardo ,USB

I. INTRODUCTION

Nowadays the gestural interaction   became very popular by using sensors. The advancement of technology in the field of Gesture recognition technology is used to identify the human hand movements. Gesture recognition technology identifies the human movements through mathematical representation. Gesture recognition technology can be used in various applications. The accelerometer can be used to sense the movement of the human particularly in given direction. The sensor would sense the motion of hand and the mouse pointer will move. The accelerometer senses the change in motion, in the tilt of the hand. The change in the acceleration values of the accelerometer which would be transmitted to the PC. The software applications take control and move the mouse pointer. Arduino Leonardo would be used in our proposed syem which gets input from the accelerometer sensor. Main advantage is easily programmable and has massive online support.

II. RELATED STUDY

Our study includes the USB protocols for communication between devices. It also includes the communication protocols used for communication between a computer mouse and the computer. Our study includes a brief analysis of previous human machine interaction techniques, different mouse technologies used previously and different gestural interaction methods implemented previously.

Revised Manuscript Received on December 22, 2018.
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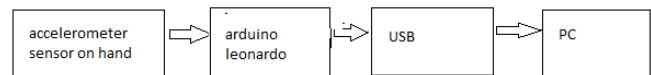## III.   PROPOSED SYSTEM MODEL

Figure 1: System Model

The proposed system design uses accelerometer as a sensor to detect the motion. Accelerometer is interfaced to a arduino. Leonardo. Arduino does the necessary processing on the sensor data and transmits it to the PC through a USB module.   The application running on the PC analyzes the received values and performs the necessary action on the mouse pointer. The input from the accelerometer is given to the A-D convertor. The output from the accelerometer is in the form of analog.
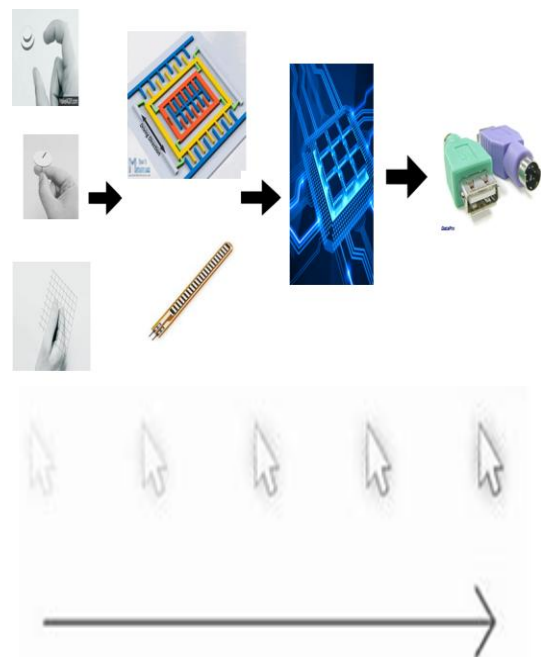

Figure. 2 Working methodology and cursor movement

Thus we use A-D convertor to convert the analog signal into digital signal. Then it is interfaced with the Arduino Leonardo from which the information is passed to PC. The main objective of this paper is to develop air mouse using accelerometer sensor. This implementation is done by using a sensor which detects hand gestures. The sensor is placed on the user side, attached to the hand to sense the movement and gives the output to a arduino leonardo to process it.

These values are transmitted through a USB module to the PC. At the receiving end a mouse control program which contains functions to control the mouse reads these values and performs many operations which is user friendly because it helps in many ways like changing the slide, pointing purpose and for open a folder without using mouse pad.

Our proposed model consists of arduino leonardo ,ADXL 345, flex sensor, with these we can control pc by our hand gestures.

A. Arduino Leonardo

Arduino is an hardware and software program agency, project and person community that designs and manufactures single-board microcontrollers and microcontroller kits for constructing digital devices and interactive items which can experience and manage each bodily and digitally. Its merchandise certified under the GNU Lesser General Public License , allowing the manufacture of General Public License or the GNU Arduino forums and software distribution by way of absolutely everyone

B. Sensing Unit

Sensing Unit consists of accelerometer sensor for detecting the hand gestures from user han movements. An accelerometer actually measures the accelerations in different directions i.e., geometrical X, Y and Z directions. These accelerations in different directions tell us in which direction the hand is tilted and how fast it is tilted. This information can be used to encode the byte code for operating a PC. Accelerometers can degree acceleration on one, or three axes. Three-axis devices are becoming extra commonplace because the cost of development for them decreases.

C. Software Architecture

Arduino programs can be written in any programming language because it has a complier for changing any type of code in to its language. It is best for students as performing any kind of operations using this is very easy and simple as well, Arduino IDE is a programming structure which has commenced from the integrated advancement. As Integrated Development Environment is level very light weighted and works on less speed, it can preserve strolling on Windows, Linux or Mac OS. Some of the important functions of IDE encompass is the textual content console, and message location toolbar for common functions. For any programming in Arduino we can use IDE platform as its supports different languages like C,C++.

D. Implementation of Hand Gesture Controlled Mouse

The working of our proposed model can be best understood from the below flow chart. The accelerometer is used to measure the acceleration in different directions. These acceleration values are used to find the tilt in different directions i.e., the movement of hand in different directions. These will be processed to convert these acceleration values into the 3 byte code which is the structure of frame which consists the amount and direction of movement of mouse in each direction.
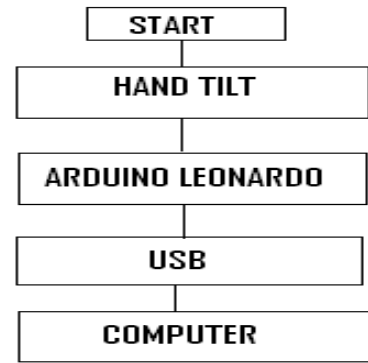

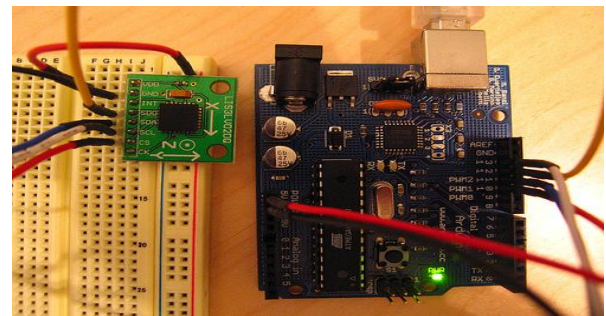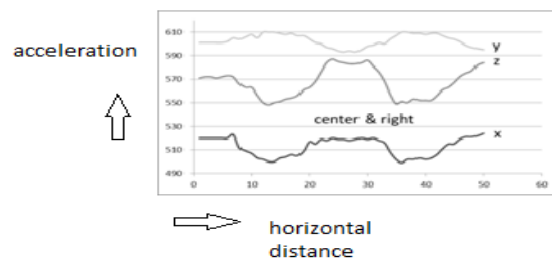**Figure 3: flow chart**

IV. EXPERIMENTAL RESULTS

Figure 4: Schematic View

Figure 3 shows the schematic view of experimental setup of the hand gestural mouse.

V. CONCLUSION

In this proposed model, air mouse has been developed to ease the work of the human. Accelerometer based air Mouse using Arduino Leonardo is used in this proposal. Accelerometer is used as a motion sensor with two axes of the accelerometer is used to sense the tilt in the particular direction and the mouse cursor is.

REFERENCES

1. A. A. Argyros and M. I. A. Lourakis. "Vision-based interpretation of hand gestures for remote control of a computer mouse", ECCV Workshop on HCI, pages 40–51, Graz, Austria, May 2006.
2. V. Athitsos and S. Sclaroff, "Estimating 3D hand pose from a cluttered image", Proc. IEEE Computer Vision and Pattern Recognition (CVPR), volume 2, pages 432–439, Madison, WI, 2003.

3. L. Campbell, D. Becker, A. Azarbayejani, A. Bobick, and A. Pentland, "Invariant features for 3-d gesture recognition", IEEE Int. Conf. Automatic Face and Gesture Recognition, pages 157–162, Killington, VT, 2015.
4. Xie, R., Sun, X., Xia, X., Cao, J., "Similarity Matching Based Extensible Hand Gesture Recognition", Sensors Journal, IEEE 2015
5. Barrett, S., "Arduino Microcontroller Processing for Everyone", Synthesis Lectures on Digital Circuits and Systems, 2013. Badamasi
6. Ashok Kumar P.M., Vaidehi V, "A Transfer Learning Framework for Traffic Video using Neuro-Fuzzy approach", Sadhana, Indian academy of science, Springer, vol 42, issue 9, pp: 1431-1442, Sept 2017.
7. Ashok Kumar P.M., Vaidehi V, " Detection of Abnormal Temporal Patterns from Traffic Video Sequences Consisting of Interval Based Spatial Events", KSII Transactions on Internet and Information Systems, vol 9, issue 1, pp:169-189, jan 2015

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