



## CURSOR CONTROL USING EYE AND HAND MOVEMENT

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### ABSTRACT

*The aim of this paper is to present a system for controlling the cursor position in a computer by hand movement. Moreover, opening an icon or item on the screen can be achieved by eye blinking.*

*This paper focuses on the concept to develop a “no-touch” interaction with the computer which means that no physical contact with the device is required. This is done to improve the human-machine interaction.*

**Keywords:** *component; formatting; style; styling; insert (key words)*

### I. INTRODUCTION

A cursor is a movable indicator on a computer screen which identifies the point that will be affected when input is given by the user. The cursor implementations can be synchronized in many ways. Earlier the systems used mouse and keyboard for the devices to operate on. Furthermore, the era of touch screens came, which took no space at all and eliminated the use of extra hardware requirements for these operations on the devices.

So now the approach is to eliminate the touch screen concept too and make a hands-free environment. This includes hand and eye gestures to take control of the movement of the cursor on screen as well as selecting item onto the screen.

The concept of this paper lies in designing a system for controlling the cursor position in a computer by human hand movements as well as opening an item on screen using human eye blinking. This system is used for implementing a module without any physical interaction with the device.

This concept can overcome the traditionally used hardware dependent devices.

Usually we use movement of hand or other parts of the body to express an idea or meaning. It is an expressive and meaningful body motion. There are two types of gestures associated. For example, a waving hand means goodbye which is termed as dynamic and the stop sign is an example of static.

Eye movement on the other hand can be used to pass many non-verbal communications. This system will be using one of the eye gestures, that is, blinking of the eye to control a certain operation on screen by making use of the IR sensor.

### II. EASE OF USE

#### A. Motivation of the project

The interest arose to learn more about the gesture control system from the mobile companies, which developed the some gesture recognition system for their phone models.

It allowed the users to slide images, turning off the screen etc.

So the idea popped up to make an elaborated version of the cursor control, that is, controlling the pointer using eye blinking and hand movement.

This is going to be the next generation in recognition technology. This research would make the patients with disability to easily operate on several devices.

### B. Literature review

Some research papers related to the gesture control were read for this project. Moreover, our old works were referred. The applications of gesture recognition are manifold, ranging from sign language through medical rehabilitation to virtual reality.

In this paper, we provide a survey on gesture recognition with particular emphasis on hand gestures and eye blinking. Each paper brought us closer to the conclusion that the gesture recognition system is the next technology to be used in the future as it doesn't require any extra hardware, it is completely based upon human behavior.

### C. Specifications

The application has been created on MATLAB environment with operating system as windows 8.1.

System web camera has been used for hand movement detection

Python has been used along with the arduino in specific for eye blink sensor.

Other way is to use microcontroller circuit with an IR sensor.

## III. PROPOSED CURSOR MOVEMENT USING HANDS-FREE ENVIRONMENT

Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads-the template will do that for you.

Finally, complete content and organizational editing before formatting. Please take note of the following items when proofreading spelling and grammar:

### A. Block diagram(Hand)

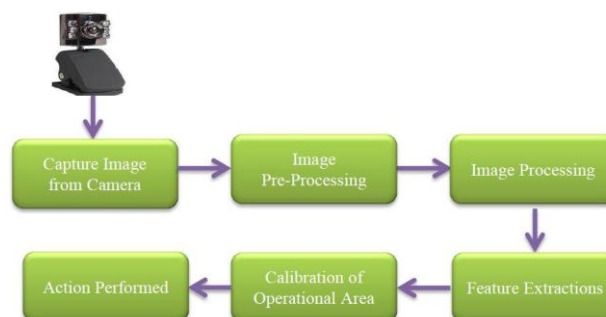


Fig. 1. Block digram of hand motion sensor

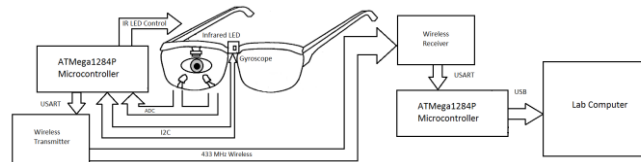
### B. Methodology

The actual process involves following steps:

- Firstly, we will be capturing the camera view.
- Secondly, the focus will be shifted on getting the current frame out of it.
- Thirdly, the concern will be for the creation of memory image.

- Then, the work for finding the pixel is done.
- Furthermore, now comparing the pixel colour is carried out.
- The final output will be displayed after a series of decision making .

## B. Block diagram(Eye)



**Fig. 2. Block diagram for eye blink sensor**

## C. Methodology

- The word “data” is plural, not singular.
- Capturing real time video using Web-Camera focusing pupil of eye.
- Processing the individual image frame.
- Flipping of each image frame.
- Conversion of each frame to a grey scale image.
- Color detection and extraction of the different colors (RGB) from flipped grey scale image.
- Conversion of the detected image into a binary image.
- Finding the region of the image and calculating its centroid.
- Mouse Movement .

a) , place your cursor at end of fourth affiliation). Drag the cursor up to highlight all of the above author and affiliation lines. Go to Column icon and select “2 Columns”. If you have an odd number of affiliations, the final affiliation will be centered on the page; all previous will be in two columns.

## IV. CONCLUSION

Implementation of mouse movement is achieved. Use of image comparison and motion detection technology to do mouse pointer movements and selection of icon is included.

We expect that if the algorithms can work in all environments then our system will work more efficiently. It is very useful in presentations and to reduce work space. Moreover, we plan to add more features such as enlarging and shrinking windows, closing window, etc. by using the palm and multiple fingers

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