

# "A Review Paper On VISION" The Eye Interpreter

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**Abstract-** *This paper describes the method for persons with neuro-Locomotor disabilities have a good level of understanding and should use their eyes for communication. The movement of a user's eyes can provide a convenient, natural, and high-bandwidth source of additional user input, to help redress this one-sidedness. We have checked eye movement which can be used as input to the computer device.our focus is on the study of interaction technique which includes eye movement into the user computer dialogue.*

**Keywords-** Computer Vision; Image Processing; Eye-controlled; OpenCV

## I. INTRODUCTION

In today's scenario, the numbers of handicapped people who have limited in mobility have been rising. These may be caused by accident, congenital, diseases, and etc. These make a person unable to move their foot, hand, or other mobility organs. Fortunately, a great number of people with motor dysfunctions still may express vocally their feelings and demands. It is extremely important for the comfort of their life. Unfortunately, there are also some people, vocally and physically disabled facing difficulties in communication These limitations make them feel unattached to the society. In spite that they cannot make their own identity because they become dependent on others.

The computer can be considered as an ideal tool for enabling communication with such people, improving it and making more reliable Computer input device, such as keyboard, mouse, joystick, and etc, have been widely used for computer interaction. Unfortunately, the existing computer input devices always require hand's control. Controlling for cursor and selection of key must be done by using a hand. To provide computer input for a handicapped person, the possible solution is by utilizing camera as a mouse and also a keyboard. This system has been used to replace typical mouse and keyboard. In this paper, we propose an interface device to use iris movements as input signals. One feature of our system is that the image processing technique is employed to detect iris movements. Therefore, the camera is settled apart from the operator without forcing the operator to wear special glasses or

a helmet. The camera is used to detect the orientation of the iris and the blinking of the eyes. The information about eyes obtained by the image processor is used as input signals of the environmental control system for the handicapped people. This environmental control system can control the cursor movement so as to perform the tasks like switching of the electrical devices like TV, radio, lights and so on.

## II. LITERATURE REVIEW

### 1.Gesture Recognition :

This paper provides a detailed survey of gesture recognition techniques with specific emphasis on hand gestures and facial expressions. The topics that were discussed in detail are Hidden Markov models also called as HMMs, optical flow, finite state machines, connecting models, particle filtering and condensation. It also talks about the existing problems and the future scopes.[1]

### 2.Various automated face and eye detection techniques:

This paper gives a review of special eye detection and head deployment recognition procedures. The main points that it touches on are the feature based face detection techniques and the image based techniques. Then this paper further also describes the eye tracking methods which are based on either sensors, computer vision, corneal reflection points, and shape.This also includes iris recognition.[2]

### 3.Rapid object detection using a boosted cascade of simple features :

This paper describes a machine learning approach for visual object detection which is capable of processing images extremely rapidly and achieving high detection rates. It firstly introduces a new image representation which is called as an integral image. The algorithm is based upon AdaBoost which selects multiple critical visual features and yields efficient classifiers. This system was operating on 384x288-pixel images and faces were detected at 15 frames per second. This

project is a major contribution to our project since this is the main algorithm used for face detection.[3]

#### **4.A Simple Algorithm for using Face as a Pointing Device using OpenCV :**

This paper describes an innovative option of using a camera to control mouse movements instead of the regular mouse. The main job of a camera is for face detection. All the mouse movements taking place will be with head movement. This paper considers the Haar Cascade approach for face detection.[4]

#### **5.Cost Eye based Human-Computer interface system :**

This paper presented an Eye based HCI system developed for paralyzed or disabled people. The mouse-based inputs were equivalent to eye actions like blinking and gazing. This system was OpenCV based and it used Facial detection via Canny Edge detection, location of eye using smoothing and sharpening operations and further Iris detection via Haar Cascade algorithm.[5]

#### **6.Real-Time Eye Tracking Using a Smart Camera :**

Eye tracking is the process of the location of an eye across various video frames to determine the direction and the gazing. This project consisted of just eye gaze movement and tracking for study purposes. The idea of implementation was based on a software called as LABVIEW to which the camera is interfaced where a previously stored sample eye pattern is present. The movement of the eye is observed by using the coordinate system and the points are lastly stored on to a spreadsheet.[6]

#### **7.Facial Feature-based method for real time face detection and tracking :**

This project aimed to present an application to replace a standard mouse by using facial features like nose tip and eyes to control cursor movement. This project used Java Media Framework for dealing with image processing applications. After locating the face and nose efficiently, the scale, orientation and gray levels are normalized.[7]

#### **8.Face as a mouse through visual face tracking :**

This paper has shown the development of a novel camera mouse which was driven by a 3D model visual face tracking technique. This system uses various face parts for movement mouse movement and clicking. It was divided into 3 modes namely direct model, joystick mode and differential

mode. For tracking the face, Piecewise Bezier Volume Deformation Model technique was considered which called the deformations as Action Units(AU). This also used the AdaBoost Algorithm.[8]

#### **9.Real-Time Eye Blink Detection And tracking :**

This paper used a facial detection technique to implement a drowsiness detection system in real time. The facial tracking was done using a webcam at 20-30fps and was implemented using C++ language in OpenCV with a single camera. Firstly the image was captured and then the face was separated using the thresholding technique for which it was first converted as a grayscale image. The eyes are detected using a centroid and if they are observed closely for a certain amount of time then drowsiness is detected. The drawback of this project was that it could only be implemented in good lighting conditions only.[9]

### **III. CONCLUSION**

Real-Time Face and Eye Tracking Techniques have been developed so far but not implemented very well to be used for Human-Computer Interaction. In this paper, we have tried to implement such an active system which would be cheap and easy to use. This paper thus by making use of facial detection and eye movement tracking can prove as an innovative option to the regular mouse using new GUI and can help the disabled or the mobility impaired people to communicate with the help of a computer

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