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Review Paper on Live Eye Gaze Tracking to Control Mouse Pointer Movement

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Abstract: *With recent advances in technology, modern computer systems are becoming more flexible. Modern computers are capable of processing millions of information per second. In such cases, traditional input devices such as a mouse or keyboard are relatively slow. In this paper we use system that can be overcome by human interaction with the computer. With innovation and development in technology, motion sensors are able to capture the position and natural movements of the human body. This has made possible a new way of communication with computers. So keeping all these in mind we propose a system which is an untouched and fast communication system. This system will be able to capture the movements of the eyeball for which it is responsible cursor control. The system processes the data in the camera feed and calibrates the parameter interface according to the user. The system then performs computer-related algorithms to determine the location of the doll's and use eyes to implement natural eye-computer interactions.*

KeyWords: *Interaction systems, Eye Gaze system, Speech synthesizer, Human Iris, Cursor Control*

I. INTRODUCTION

Eye contact can be a technique used in a variety of fields, including neuroscience, psychology, scientific disciplines, human-computer interaction, and more. However, attention has focused on the early use of eye-trackers to review the cognitive processes of the brain. The concept of using a watch tracker as a tool for computer control is one of the less studied areas of research, focused solely on helping people with motor impairments who do not see alternatives. The eye is used as a fix. There are different types of eye viewing methods available but most of them are very uncomfortable for the user. More invasive techniques involve placing a contact lens with a magnetic coil on the user's cornea and attaching it with suction.

II. LITERATURE REVIEW

- 1) The existing system such that the interaction amongst the computer and human is carried out with eye-tracking and blink-detection. In this concept, human computer interface system exists which tracks the direction of the human eye. The particular motion and the direction of iris is employed to drive the interface by positioning the mouse cursor consequently. The location iris is completed in batch mode. Here the frames are stored in a permanent storage device and are retrieved one by one. Each of the frames is processed for finding the location of the iris position and there by placing the mouse cursor consequently. Such a system that detects the iris position from still images provides an alternate input modality to facilitate computer users with severe disabilities.
- 2) In this paper, an individual human computer interface system using eye motion tracking is introduced. Traditionally human computer interface uses mouse, keyboard as an input device. However, the proposed vision-based virtual interface controls system work on various eye movements such as eye blinking. The planned virtual multimodal interface system provides vision-based mechanism, to convey between human and computer system, instead of conventional human computer interaction through mouse and keyboard. For motion tracking, recognition of eye is explored through an optical flow technique. To minimize the error caused by light variation, histogram equalization and max-min normalization is used to improve every frame. An innovative system for user-computer interaction based on the user's eye-gaze behavior.
- 3) In this paper we roughly describe some representative studies in the field of eye tracking, covering some aspects regarding different types of devices, algorithms for pupil detections, image processing or data filtering and also some well known applications in assistive technology, human computer interaction, virtual reality, psychology or eLearning. As a general tendency we can conclude that in the future eye tracking approaches will be a hot subject for researchers. It is argued by some traditional conferences, international projects, books and scientific papers and technical reports.

For example, held once every two years, Eye Tracking Research & Application (ETRA) Conferences join together companies and researchers involved in eye tracking technologies and highlight new hardware and software solutions. Among many others research groups, EyeBCom Corporation is an advanced center for eye tracking research and development dedicated to the creation of innovative eye tracking technology to improve and save lives, support the advancement of research, and revolutionize human Biotechnology interaction. Special attention should be paid for performing experimental procedures in order to evaluate the usability, accuracy and reliability of the eye tracking systems.

- 4) This research provides a system that is able to trigger mouse movements for controlling an interface for the people who are suffering from some kind of severe. Physical disabilities and who cannot use the system with their hands. The system is able to track eye movements efficiently and accurately by using the pupil portion and can accurately detect eye blinks whether voluntary and involuntary. The system can track eye portion with the 90% detection accuracy. The system is expanded to work in real time using recorded videos. The proposed system is purely non- intrusive as no hardware device has been attached to the human body so the system is user friendly and easier to configure. There are still some aspects of the system that are under experimental conditions and development. But this project proved to be an overall success and achieved the goals and requirements as proposed in the system specifications. Many aspects of the system can be a part of the future work for making more efficient and robust eye tracking system. The system can be shifted from recorded videos to a live web cam video with some modifications, for making it a live system. The system can be developed in such a way so that it could also detect human eye gazes and act accordingly. There can be some kind of mouse action when the blink is detected. System efficiency can be achieved for making it a more efficient dynamic system.

III. SYSTEM DESIGN

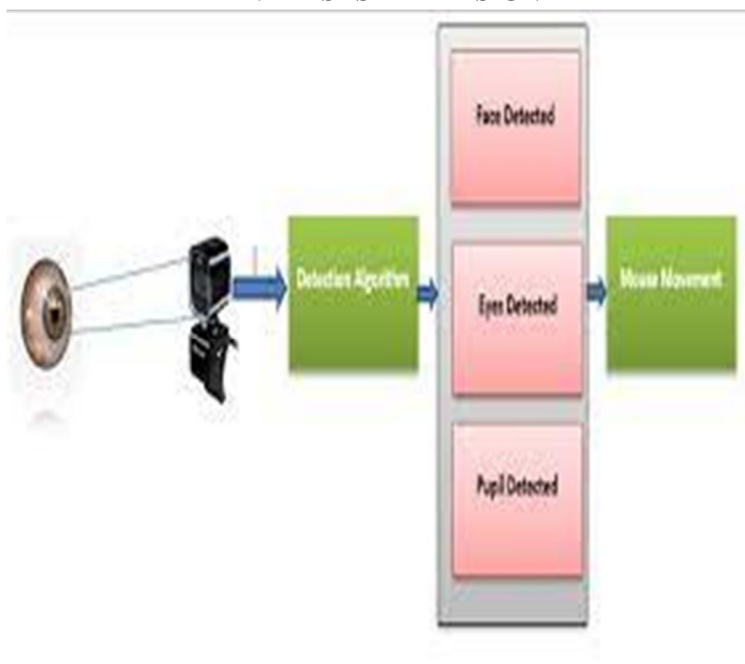


Fig : Eye Gaze Tracking to Control Mouse Cursor Movement

IV. CONCLUSION

This paper is a comprehensive study of the wedge-based interaction process. The mouse pointer is operated using the eye. That is why we have successfully developed low cost based systems that aim to handle the most physically challenging subjects and are also affordable. It makes conversation more efficient and enjoyable

V. ACKNOWLEDGEMENT

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