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Eye Tracking System Using Isophote Eye Center Detection With Blink Perception

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Abstract— Eye tracking has been widely used in human computer interaction .The ubiquitous application of eye tracking is done by the requirement of dedicated and expensive hardware , such as infrared high definition camera . Therefore system based solely on appearance are being proposed in literature . Real time face image capturing along with eye gaze tracking can provide a means of user input to the computer. Here we combine a efficient method for tracking eye and detecting blink to produce on environment which is physically disabled person can access the computers very easily. Aim is to perform very accurate eye center location and tracking using a simple webcam.

Keywords- Isophote eye center (Iris) tracking ,Face detection ,Blink detection .

I. INTRODUCTION

Communication between human beings seems to be much simpler than a man and computer system. This struggle increases when a person is disable . The eye moment can be used as means to communicate with computer eye tracking system use image processing techniques base on biometrics. In image processing the input data is converted into the digital form and various mathematical model are applied to the data to create a more enhanced image to perform task like recognition or authentication .Physically disabled community needs a inexpensive technology to interact with computer system. Those person who cannot use mouse for interaction must rely on alternative method on such as eye tracking and gesture recognition systems. Disable people who use to computer systems can move their eye even when other parts of the body is paralyzed.

II. LITERATURE SURVEY

Sidra Naveed, BushraSikander, et al ^[1] proposed a system which 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 is expanded to work in real time using recorded videos. The proposed system is purely nonintrusive 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.

G.V. Siva Krishna, et al ^[2] proposed, the primary object of this project is to provide an Eye based mouse control system and a method there of that detects the driver's fatigability in time by a processing circuit that processes an EEG (electro-encephalogram) signal. To achieve this object, the present invention includes an EEG detection . The way to detect drowsiness of the driver is by the EEG detection circuit to get an EEG signal of a human brain. The micro-control circuit receives the EEG signal and generates a control signal that is sent to the processing circuit. The detection result is sent back to the micro-control circuit for output of the detection result.

Ruchika A. Pate, Mr. Sandip, et al ^[3], proposed, Eye tracking is considered effective and reliable human-computer interaction and communication alternative methods. Hence, they have been many subject of research analysis. There are many approaches of implementing these technologies and have been reported as in literature. In this paper it investigated existing methods of eye tracking. There can be many applications that can benefit from utilizing effective eye tracking methods. And, the research is facing the challenges in presenting robust methods which can be used in applications to detect and track eye accurately.

TerezaSoukupova´ and Jan C`ech, et al ^[4] proposed, A real-time eye blink detection algorithm was presented. We quantitatively demonstrated that regression-based facial landmark detectors are precise enough to reliably estimate a level of eye openness. While they are robust to low image quality (low image resolution in a large extent) and in-the-wild phenomena as non-formality, bad illumination, etc.

III. PROPOSED WORK

In this paper, we proposed an Application based on eye blink detection has increased because it is suitable for people who are either normal or disabled. Determining eye status that is open or closed is more difficult than just determining eye locations, because of their small region occupies on face information or weak contrast between eye and the surrounding skin. The proposed system is a new system for detecting eye blink feature from a video.

It is tested for online or offline video. It does not require any expensive or dedicated software. A webcam is the only device required. The system output detects the information about the eye state, either it open or close, which can be applied in many applications like: eye typing, detection of driver fatigue etc.

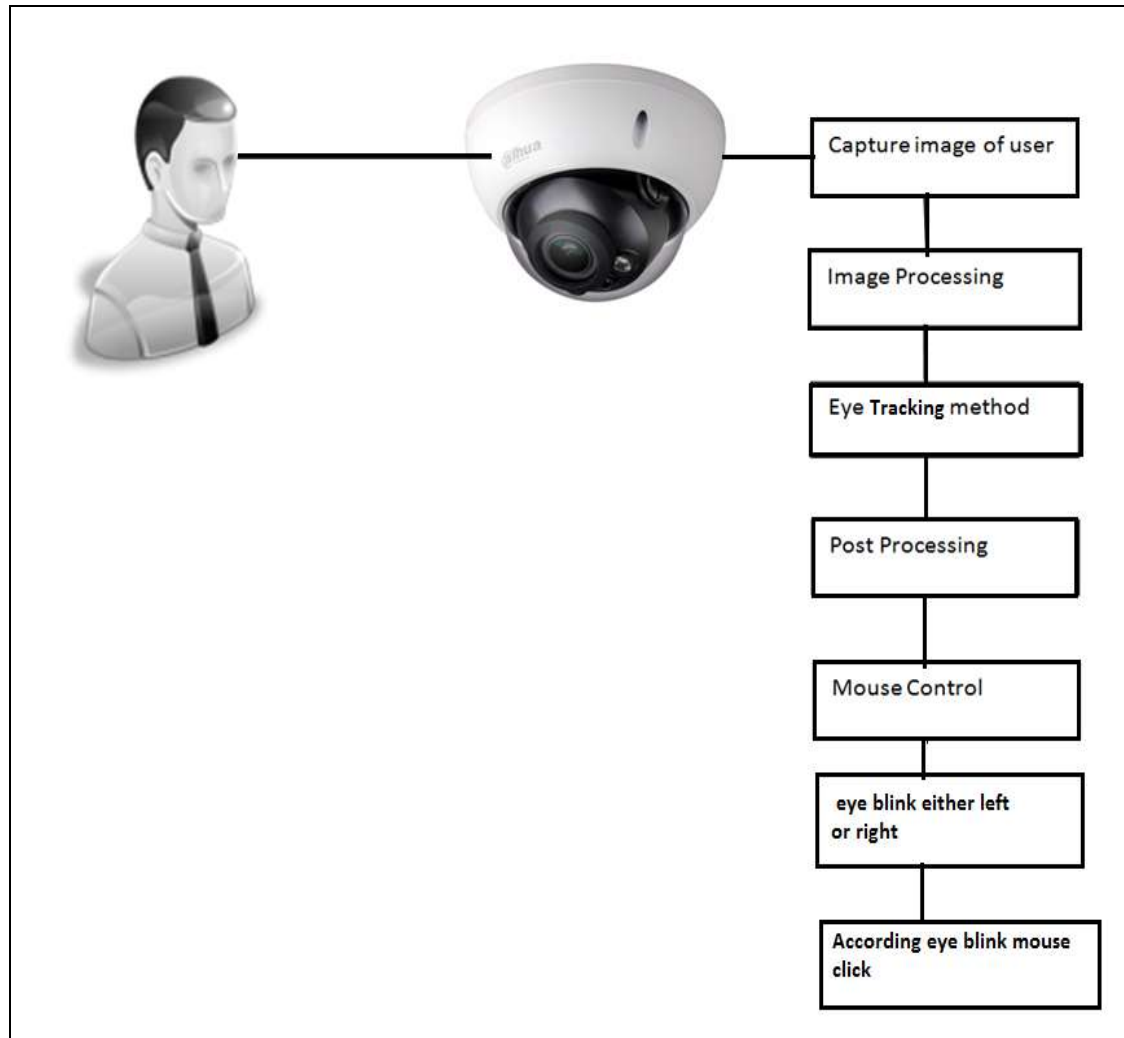


Fig. 1. proposed system architecture

IV. CONCLUSION

In this paper, we have proposed Eye detection and tracking are important operations used in many human computer interaction applications and research. Here the images captured by the camera are processed against isophote eye center tracking and eye blink detection method. The curves that connect the points of equal intensities are called isophote eye tracking algorithm using which eye centre is calculated. Blink detection method count the number of black and white pixels of the image to find the status of the eye. The users will have different characteristics based on face color, presence of spectacles, poses of face and lighting conditions. From the analysis, it is clear that this product will work efficiently for even user with spectacles. This scheme has succeeded in detecting eyes with high accuracy. So this method which combines isophote eye center detection and blink detection gives a precise result.

REFERENCES

- [1] Asst. Prof. Sasinas Alias Haritha Z A, Raveena P.V, Arun K.S, Nithya P.N, Vishnu Balan M, Sab areesh Krishna, "Eye Tracking System Using Isophote Eye Center Detection With Blink Perception" International conference on Signal Processing, Communication, Power and Embedded System (SCOPES)-2016 Ruchika A. Patel and Mr. Sandip R. Panchal, "Detected Eye Tracking Techniques: And Method Analysis Survey", 2014 IJEDR.
- [2] g.v.siva krishna , "a novel approach of eye tracking and blink detection with a human machine" International Journal Of Advancements in Research Technology, vol. 2, Issue 7 july – 2013.
- [3] Sidrab Naveed Bhushra Sikander, and Malik Sikander Hayat Khiyal, "Eye tracking System with Blink Detection" journal of computing, Volume 4, issue 3, march 2012, issue 2151-9617.
- [4] Robert Vzamenti Theo Gevers, "Accurate Eye Center location And tracking using Isophote Curvature", 2008 conference on computer vision and Pattern Recognition Anchorage AK USA. pp 1063-6919.s