

VIRTUAL MOUSE ASSISTANT

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Abstract: The field of Human pc interplay has witnessed a top notch boom inside the past decade. The appearance of tablet computers and cellular telephones allowing contact based management has been hailed warmly. The researchers on this area have additionally explored the ability of 'eye-gaze' as a probable manner of interplay. some commercial answers have already been released, however they're as but pricey and provide limited usability. So, In our venture, we are able to use our eye motion to manipulate the mouse cursor. This undertaking is specifically developed to help bodily disabled people. We make facial landmark detection the use of the Dlib shape predictor to hit upon face and eyes and calculate the positions by means of positive threshold values. we will correctly locate the movement of the pinnacle by way of detecting the placement of the nose and use it as a centroid. The combinations of head and eye movements are mapped to numerous mouse events, such as move, click on, drag, and so forth.

A SVM classifier detects eye blink as a pattern of EAR price in a quick temporal window. This version classifies whether the attention is in an open country or near a kingdom and whether or not an eye blink is present or no longer. The unique model has been taught by using the usage of the iBUG three hundred -w dataset which consists of the pix of open and closed. And this gadget may be used for the higher limb disabled who didn't use the traditional mouse and keyboard. Moreover, it can also be used for trendy PC customers to play PC somatic video games and so on.

Keywords: Dlib Shape Predictor, Python, OpenCV, Haar-cascades classifiers, Human Computer Interaction, Support vector machine.

1. INTRODUCTION

Advances in the eye gaze tracking era over the last few many years have brought about the development of promising gaze estimation strategies and packages for human pc interplay. traditionally, studies on gaze tracking dates returned to the early 1900s, beginning with invasive eye tracking strategies. those blanketed electro-oculography using pairs of electrodes placed across the eyes or the scleral search techniques that consist of coils embedded into a contact lens adhering to the eyes [1].

The first video based eye monitoring look was made on pilots operating aircraft controls inside the 1940s. Studies on head-hooked up eye trackers advanced within the 1960s and gaze monitoring evolved further in the 1970s with a focal point on improving accuracy and decreasing the restrictions on customers. With growing computing energy in devices, actual time operation of eye trackers became viable all through the 1980s. however, till this time, attributable to restricted availability of computer systems, eye tracking become especially limited to mental and cognitive studies and clinical studies.

The software specializes in preferred motive human computer interplay. This changed inside the 1990s as eye gaze discovered packages in laptop input and management. put up in 2000, speedy improvements in computing velocity, virtual video processing and occasional fee hardware introduced a gaze monitoring system closer to customers, with applications in gaming, digital truth and web-advertisements [2].

2. RELATED WORK

Several types of eye movements are studied in eye gaze research and applications to collect information about user intent, cognitive processes, behavior and attention analysis.

These are broadly classified as follows:

- a). **Fixations:** These are phases when the eyes are stationary between movements and visual input occurs. Fixation related measurement variables include total fixation duration, mean fixation duration, fixation spatial density, number of areas fixated, fixation sequences and fixation rate.

- b). **Saccades:** These are rapid and involuntary eye movements that occur between fixations. Measurable saccade related parameters include saccade number, amplitude and fixation saccade ratio.
- c). **Scanpath:** This includes a series of short fixations and saccades alternating before the eyes reach a target location on the screen. Movement measures derived from scanpath include scanpath direction, duration, length and area covered.
- d). **Gaze duration:** It refers to the sum of all fixations made in an area of interest before the eyes leave that area and also the proportion of time spent in each area.
- e). **Pupil size and blink:** Pupil size and blink rate are measures used to study cognitive workload. Table I presents the characteristics of different eye movements and their applications.

3. EXISTING SYSTEM

The traditional input devices like mouse, keyboard cannot be used by the physically disabled people on their own. In existing systems like Tobii, eye gaze detectors, infrared rays detectors are costly equipment which are used for eye gaze detection. Some of these included electro-oculography using pairs of electrodes placed around the eyes or the scleral search methods that include coils embedded into a contact lens adhering to the eyes [3]. In the existing system, a geometric score based on thresholding function is used to measure EAR value for classifying the eye into open or closed state.

Limitations of Existing System

- a). Extra hardware equipment required. (Eye lenses, Infrared rays detector, etc..).
- b). In this existing system, we use a simple geometric approach to measure the eye blink detection during video capture.
- c). The variations in eye-movement and organic components of people lead to demanding situations in achieving steady and repeatable performance from gaze tracking techniques. Consequently, notwithstanding several decades of development in eye gaze studies, overall performance assessment and comparison of different gaze estimation strategies across unique systems is nonetheless a difficult task.

4. PROPOSED SYSTEM

The main objective of this work has been building a non-intrusive face gesture tracking system based on the images taken by conventional video cameras and performing real-time tracking and analysis.

Only requirement to operate this system is, individual having at least one eye with good vision and ability to control the computer.

In this device, we use facial landmarks detection for locating the role of eyes, nose and mouth from a given photo and those factors are used for EAR and MAR calculation. So, to enhance accuracy, on this version we're using SVM classifiers the usage of LBP capabilities for green blink detection in low mild resolution or even in one-of-a-kind head oriented snapshots via education the version the use of the ibug-300-w dataset.

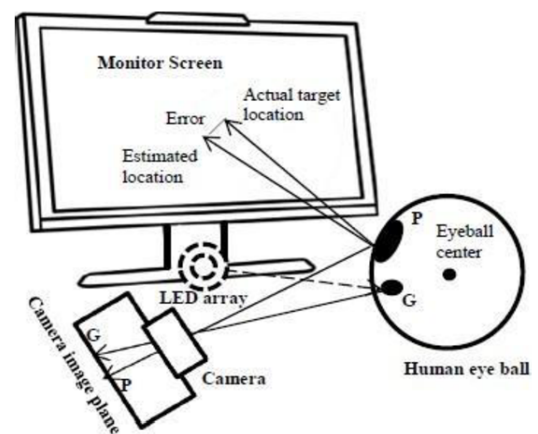


Figure 1: Block Diagram of Architecture

Methodology

The purpose of the design section is to set up a solution to the problem which includes the necessary document. This component is the whole action in moving the problem area to the answer domain. The layout phase satisfies the necessities of the machine. The layout of a gadget might be the most vital difficulty of heat heartedness, the standard of the software program

It has a severe effect on the later part, drastically trying out and renovating. The output of this element is the style of the record. This document is analogous to a blueprint of answers and is hired later throughout implementation, trying out and protection. The design interest is typically divided into 2

separate stages: device design and specific layout. gadget layout, conjointly known as the top-ranking style, aims to spot the modules that ought to be inside the machine, the specs of those modules, and the manner they pass with each other to deliver the required results.

On the pinnacle of the system style are all the main information structures, report codecs, output codecs, and additionally the primary modules in the gadget and their specs rectangular measure set. system layout is the method or art of processing the design, components, modules, interfaces, and knowledge for a machine to satisfy such needs. Users will study it because of the software's structure principle to improve. In particular layout, the internal logic of every of the modules laid out in machine layout is decided.

Throughout this element, the details of the data of a module square degree is now and again laid out in a high-degree style description language that is independent of the goal language within which the software bundle can sooner or later be enforced. In gadget design the principal goal is on distinguishing the modules, whereas in the course of careful style the main goal is on planning the common sense for every of the modules.

5. RESULTS

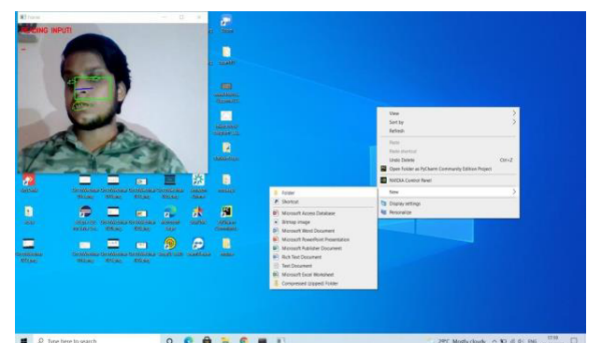
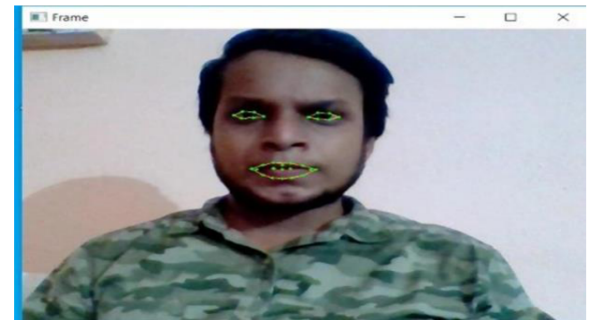
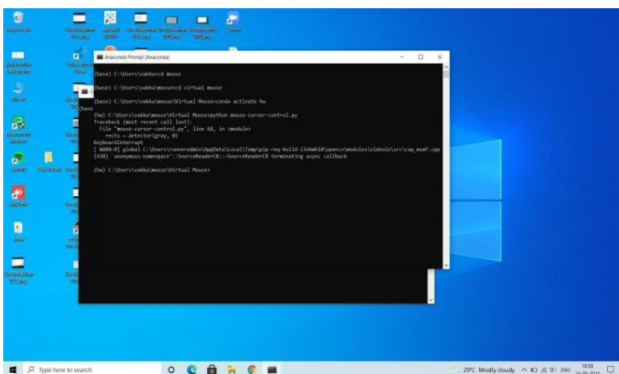
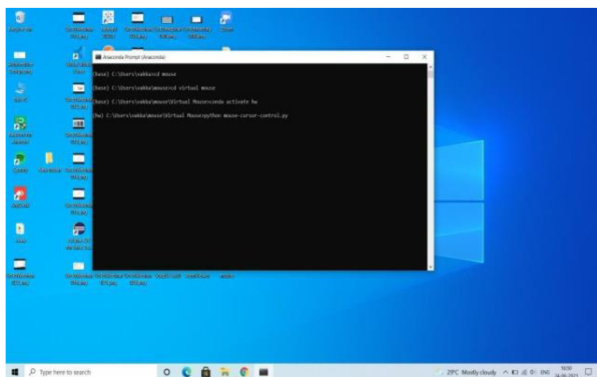


Figure.2: Output of entire Input Mechanism

6. CONCLUSION

Eye gaze estimation is an interdisciplinary area of research and improvement which has acquired a number of hobbies from educational, industrial and well known user communities within the last many years attributable to the convenience of availability of computing and hardware resources and increasing demands for human pc interaction techniques.

In this paper, an in-depth literature overview is made at the current advances in eye gaze studies, and information in statistical layout is supplied to highlight the variety in numerous components such as platforms, setups, users, algorithms and overall performance measures present among distinct branches of this area.

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