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MOUSE CURSOR CONTROL WITH EYEBALL USING MACHINE LEARNING

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ABSTRACT:

There are different reasons for which people need an artificial of locomotion such as a virtual keyboard. The number of people, who need to move around with the help of some article means, because of an illness. Moreover, implementing a controlling system in it enables them to move without the help of another person is very helpful. The idea of eye controls of great use to not only the future of natural input but more importantly the handicapped and disabled. Camera is capturing the image of eye movement. First detect pupil center position of eye. Then the different variation on pupil position get different command set for virtual keyboard. The signals pass the motor driver to interface with the virtual keyboard itself. The motor driver will control both speed and direction to enable the virtual keyboard to move forward, left, right and stop.

Key words: eye movement, virtual keypad, artificial of locomotion.

I INTRODUCTION

Nowadays, personal computer systems take a vast part in our day to day survival since they are used in areas such as at workplace etc. These applications have one thing in common i.e. the use of personal computers is mostly dependant on the data input methods such as mouse. But this is not a problem in case of a healthy individual, this may be a problem for people with less freedom of movement of their limbs [1]. In such cases, it might be preferable to use input methods which supports the abilities of the region such as eye movements. To enable such input method as a substitute, a system is designed which follows a low-cost approach to control cursor on a computer system without the use of mouse [6]. In the proposed system, the cursor movement of the computer system is controlled by the eyeball movement using OpenCV. This system comprises of Raspberry pi [5]. It is interfaced with IP camera which detects the Eyeball movements and based on these eyeball movements the cursor can be controlled accordingly which are processed using the Open CV (Open Computer Vision).Nowadays personal computer systems are carrying a huge part in our everyday lives as they are used in areas such as work, education and enjoyment. What all these applications have in common is that

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the use of personal computers is mostly based on the input method via keyboard and mouse. While this is not a problem for a healthy individual, this may be an insurmountable bound for people with limited freedom of movement of their limbs. In these cases it would be preferable to use input methods which are based on more abilities of the region such as eye movements. To enable such substitute input methods a system was made which follows a low-price approach to control a mouse cursor on a computer system. The eye tracker is based on images recorded by a mutated webcam to acquire the eye movements. These eye movements are then graphed to a computer screen to position a mouse cursor accordingly. The movement of mouse by automatically adjusting the position of eyesight. Camera is used to capture the image of eye movement. In general, any digital image processing algorithm consists of three stages: input, processor and output. In the input stage image is captured by a camera. It sent to a particular system to focus on a pixel of image that's gives, its output as a processed image. Embedded system is combination of hardware and software.An embedded system can be an independent system or it can be a part of a large system. An embedded system is a microcontroller or microprocessor based system which is designed to perform a specific task. For example, a fire alarm is an embedded system; it will sense only smoke Python is a high-level language. This means that Python code is written in largely recognizable English, providing the Pi with commands in a manner that is quick to learn and easy to follow. This is in marked contrast to low-level languages, like assembler, which are closer to how the computer ―thinks‖ but almost impossible for a human to follow without experience.

2. RELATED STUDY

There are two components to the human visual line-of-sight: pose of human head and the orientation of the eye within their sockets. Investigated these two aspects but will concentrate on the eye gaze estimation in this concpt. The present of novel approach called the ―one-circle‖ algorithm for measuring the eye gaze using a monocular image that zooms in on only one eye of a person. Observing that the iris contour is a circle, Estimate the normal direction of this iris circle, considered as the eye gaze, from its elliptical image. From basic projective geometry, an ellipse can be back-projected into space onto two circles of different orientations. However, by using a geometric constraint, namely, that the distance between the eyeball's center and the two eye corners should be equal to each other, the correct solution can be disambiguated. This allows us to obtain a higher resolution image of the iris with a zoom-in camera, thereby achieving higher accuracies in the estimation. A general approach that combines head pose determination with eye gaze estimation is also proposed. The searching of the eye gaze is guided by the head pose information. The robustness of our gaze determination approach was verified statistically by the extensive experiments on synthetic and real image data. The two key contributions in this concept are that show the possibility of finding the unique eye gaze direction from a single image of one eye and that one can obtain better accuracy as a

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consequence of this. The first technique is proposed to estimate the 3-D eye gaze directly. In this technique, the cornea of the eyeball is modelled as a convex mirror. Via the properties of convex mirror, a simple method is proposed to estimate the 3-D optic axis of the eye. The visual axis, which is the true 3-D gaze direction of the user, can be determined subsequently after knowing the angle deviation between the visual axis and optic axis by a simple calibration procedure. Therefore, the gaze point on an object in the scene can be obtained by simply intersecting the estimated 3-D gaze direction with the object. In addition, a dynamic computational head compensation model is developed to automatically update the gaze mapping function whenever the head moves. Hence, the eye gaze can be estimated under natural head movement. Furthermore, it minimizes the calibration procedure to only one time for a new individual. The advantage of the proposed techniques over the current state of the art eye gaze trackers is that it can estimate the eye gaze of the user accurately under natural head movement, without need to perform the gaze calibration every time before using it. Our proposed methods will improve the usability of the eye gaze tracking technology, and believe that it represents an important step for the eye tracker to be accepted as a natural computer input device.

3 METHODOLOGY

4 The user has to sits in front of the display screen of private computer or pc, a specialised video camera established above the screen to study the consumer's eyes. The laptop constantly analysis the video photo of the attention and determines wherein the consumer is calling at the display screen. not anything is attached to the consumer's head or body. To "pick out" any key, the user seems at the key for a exact period of time and to "press" any key, the consumer just blink the eye. On this device, calibration procedure is not required. For this system enter is simplest eye. No outside hardware is connected or required. Camera gets the input from the eye. After receiving these streaming movies from the cameras, it'll spoil into frames. After receiving frames, it will check for lights conditions because cameras require enough lighting fixtures from external sources in any other case blunders message will show at the screen. The captured frames which can be already in RGB mode are transformed into Black 'n' White. Five. Pics (frames) from the enter supply focusing the eye are analysed for Iris detection (middle of eye).

4 RESULTS EXPLANATION

The current android application is developed using Xml, Java, SQL with Firebase connectivity. It can be used by every individual who are in a need of fulfilling their household services.

At the time of submission of my application was capable of doing the following:

- Displaying thehome screen with different fragments.
- Authentication of user by using login screen using Firebase.
- Home screen to display based on user or service provider.
- After successful login of user, they can choose the service and book a slot of their particular service provider from the displayed list.

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- Add, update, view, delete the user details.
- After successful login of service provider, they can view all the bookings that are booked by the users and can attend them one by one.
- Service provider can also set his preferences to not available, if he's too busy or many users had already booked him.
- Service provider has the ability to change their particular radius of location for servicing.
- He can set up to 10 km radius.
- Logout and end the session.

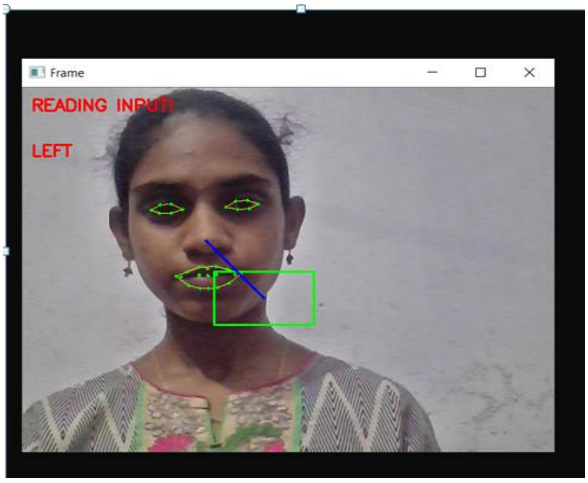

Fig.4.1. OUTPUT results.

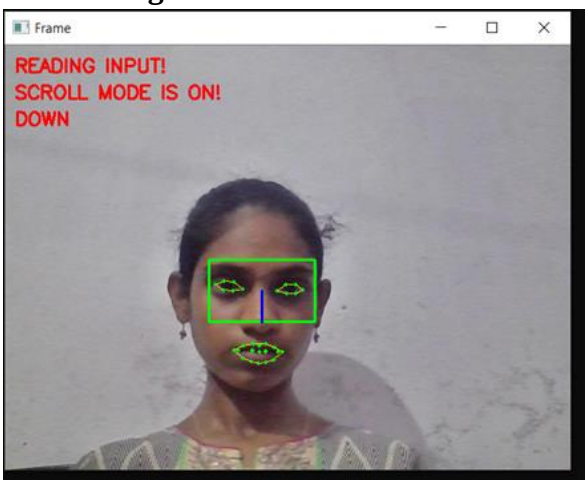

Fig.4.2. Detection of Eyeball.

CONCLUSION

First detect pupil center position of eye. Then the different variation on pupil position get different command set for virtual keyboard. The signals pass the motor driver to interface with the virtual keyboard itself. The motor driver will control both speed and direction to enable the virtual keyboard to move forward, left, right and stop.

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