Pupilla Dynamism Based Missile Moving and Snap Options

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***Abstract*- Now a days computer plays a vital role in the world. Eyeball control is the greatest use for the handicapped and disabled importantly. This system is most useful to operate computers without hands. This system controls the cursor by the eyeball movement. In this project Camera is used for capturing the image of eye. It first detects eyeball position. Then the cursor point is moved to various positions depend on the movement of eyeball. Additionally Mouse clicking operations are carried during eye blinking. The Implementation process for eyeball detection is done using Raspberry Pi. Image processing is done by Python coding and Raspberry Pi is operated in Linux operating System. This project helps to do right click, left click, double click and drag options by eye movement.**

Keywords- Raspberry Pi, Linux, Python, pupil, Web Camera.

I. INTRODUCTION

Computer usage is increasing day by day, without computer no one can consider their life. Unfortunately, the disabled people cannot operate the computer parts such as keyboard and mouse effectively because their illness. This is the main limitation of computers. The human computer interaction technology provides a solution for those peoples who are suffering from the motor disability. Therefore it is very important to take part in the human computer interaction field and found the better solution to that problem. User's eye movement can provide a convenient source of input. By tracking the moving direction of user's eye the cursor is controlled. In a human eye-computer interaction system, there is a need to understand eye movement to detect an eye. To detect an eye accurately, pupil of an eye is focused. The important and primary step of human computer interaction system is pupil detection and tracking. The pupil detection and tracking is done by image processing techniques. The proposed work includes eyeball detection, eye tracking and eye blink detection. The proposed system helps very much to the physically challenged persons without hands to use the computer efficiently and easily.

II. LITERATURE SURVEY

In this paper [1] author describes the movement of cursor and they executed in command window only. They used Raspberry Pi with Python coding. They used IR sensor as movement sensor and a Web camera to capture the eye image. They used image processing techniques such as Haar cascading process, Morphological process, Finding contours, Edge detection.

In this paper [2] the author describes a direct-select vision-controlled communication and control system. Its primary users can be adults and children with cerebral palsy, spinal cord injuries, brain injuries, ALS, multiple sclerosis, Brainstem strokes, etc. Eye gaze can be used in homes, offices, schools, hospitals, and long term care facilities. By looking at control keys displayed on a screen, a person can synthesize speech, control his environment (lights, appliances, etc.), type, operate a telephone, run computer software, operate a computer mouse, and access the internet and also e-mail.

In this paper [3] the authors states the eye ball tracking and implementation. They captured the image of eye using head mounted setup. The image processing was done in MATLAB software. The captured image was converted into gray image and from that the center position of eyeball was identified. The cursor point was moved where the center point moved.

In this paper [4] the author states controlling the mouse cursor by eye implemented specially for a game. It was done by three steps: 1.Gaze determination 2.Eye tracking 3.Blink detection. For this the camera requires sufficient lights from external sources.

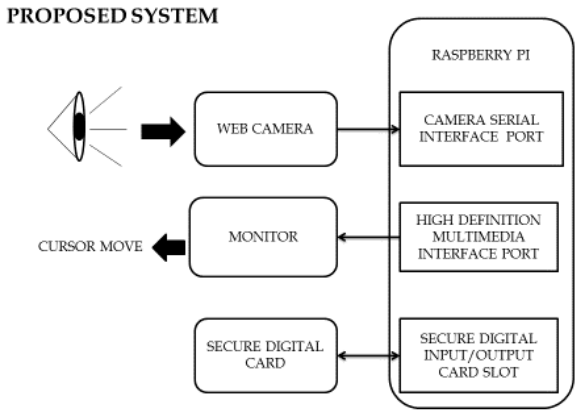
III. EXISTING SYSTEM

The existing system such that the interaction between the computer and human is carried out with eye-tracking and blink-detection. In this concept, human computer interface system tracks the direction of the human eye. The particular motion and the direction of eye is hired to drive the interface by positioning the mouse cursor to that point consequently. The location of eye is completed in batch mode. Here the frames are stored in a RAM and are processed one by one. Each of the frames is processed for finding the location of the eye position and the cursor is moved to that position. To detect the eye position head mounted setup which includes IR sensor or Horizontal and Vertical electrodes are employed.

DRAWBACKS OF EXISTING SYSTEM

1.It affects eyes of users and causes vision problems for them.
2.User feels uncomfortable.
3.It simply avoids short blinks.

IV. RELATED WORK



Raspberry Pi board of version 3 is the main component of the proposed system. This board is connected with Web Camera, Monitor, and SD card. Web camera is connected with Raspberry Pi board through Camera Serial Interface port. It continuously captures the eye movement. Monitor is connected to HDMI port of Raspberry Pi. Raspberry pi uses a SD card, to install Raspbian OS and programming codes.

CAMERA

The camera is used to capture the images as videos and send it into the Raspbian board through an USB cable. The camera used in the proposed system is a web camera of inexpensive cost. Then the video taken is processed frame by frame.

SD CARD

The main role of SD card is storing the Raspbian operating system module and the program of operation. The Raspberry Pi board is operated by using Python programming language. Capacity of SD card is up to 8GB.

MONITOR

The monitor gets the input from the HDMI port of the Raspberry Pi board. HDMI is simply defined as a High Definition Multimedia Interface port which is used to monitor the uncompressed video data. It converts digital image signal into analog signal and gives it to the monitor.

SYSTEM APPROACH

The Web Camera is placed in a constant position and set to capture the image of eye movement. The center position of eye is first detected and then the different variation on eye position is identified to get different movement of cursor. The Implemented process for eye detection is performed using Raspberry pi. The eye position is taken as the coordinates of (x, y). In the SD card used in Raspberry pi Raspbian OS and open CV are installed. First image of eye will be captured by USB Camera. From the image center position of eye is identified by open CV code.

IMAGE ACQUISITION

As a primary section, Acquisition is very important. A normal USB webcam is used for capturing a close-up picture of eye. For obtaining a clear image optimum camera settings and light source positions are very essential. To call the webcam for getting the real time video input data Python program is used.

IMAGE PROCESSING

Image processing is one of the forms of signal processing for which the input is an image, such as photographs or frames of video; the result of image processing can be either an image or a set of characteristics or parameters associated to the image. Most image-processing techniques treats the image as a two-dimensional signal and applies standard signal processing techniques to it. Here we are splitting each pixel of the image into RGB components. For processing the image RGB components are converted into GRAY scale image.

IMAGE ANALYSIS

Image analysis is defined as the process of extraction of meaningful information from images. In this project we use several image analyzing techniques. The main thing is the color detection. First we receive an image from the web camera. Then each pixel is retrieved from the image and extracts the RGB values from each pixel. Using Cascade Classifier option user's eye is detected. It is cropped and displayed the eye with a square box. It displays the square box when the eye is opening and never displays while blinking.

CAPTURING REAL TIME VIDEO USING WEB CAMERA

- Setting up the camera such that focus on user's eye
- Processing one image frame at a time.
- Conversion of each frame from RGB to a gray scale.
- Conversion of the detected image into binary image.
- Finding the eye region of the image and calculating its center point.
- Mouse Movement
- Clicking operations when blinks occurs.

V. ADVANTAGES OF PROPOSED SYSTEM

- Hands-free computing
- Helps to the handicapped to use the computer.

- User can control mouse operations like left click, right click and double click etc. by movement of eyes.

VI. REFERENCES

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