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Mouse Cursor Control Based on Facial Movement and Voice Recognition

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ABSTRACT – *It is really difficult for people with disabilities to operate the mouse. We proposed this eye movement mouse cursor control to find a solution for people who can't physically use a mouse and open the application based on user's voice using voice recognition technique. Eye Gaze is another way to access your computer by using your eye movements to control your mouse. For those who like touch screens without access to a mouse, Eye Gaze is an alternative way to allow users to interact with their computer using their eye movements. Eye movements can be viewed as a central real-time input medium for human-computer communication. This is reliability, mobility and usability of eye-tracking technology in user-computer interaction, this system proposes a new eye-control system that uses a webcam without additional hardware. It has been. The proposed system focuses on providing a simple and convenient interactive mode using only the user's eyes. The flow of use of the proposed system is designed to fully follow natural human habits. The proposed system describes the implementation of both the iris and cursor movement depending on the iris position. It can be used to control an on-screen cursor using a webcam and is implemented in Python packages.*

Key Words: Face Detection, Eye Region Detection, Face Movement, Voice Recognition.

I INTRODUCTION

In our modern period, there are, many uses for computers so all must learn to use a computer. In the computer, the most, important feature is the moving mouse cursor. Few peoples are not able to access the mouse pointer for their convenience we create a web application to move the cursor. As the voice assistant is using engineering science, the results provided are highly accurate and efficient. And also This project is a realtiming system that will control the cursor movement by tracking the eye movements of the user and mapping it to the computer screen. Controlling a mouse cursor using eye movements is a form of eye-tracking technology that allows individuals to interact with a computer by gazing at specific points on the screen. This technology is often used as an accessibility tool for people with physical disabilities, allowing them to control a computer without having to use a traditional mouse or keyboard.

Several commercially available eye-tracking systems enable this type of interaction, and they typically use infrared cameras and image-processing algorithms to track the movement of the user's eyes. Some systems also incorporate other features, such as blink detection, to provide additional input options. It is important to note that controlling a mouse cursor using eye movements can take some time to master and may not be suitable for everyone, as it requires a certain level of visual acuity and eye-hand coordination. However, for those who are able to use it, it can be a highly effective and empowering tool for increasing independence and improving quality of life.

Voice recognition, also known as speech recognition, is a technology that enables computers to recognize and transcribe human speech. It involves capturing audio input, converting it into digital form, and then analyzing it to identify the words and phrases being spoken. -Voice recognition technology has come a long way in recent years,

and there are now a variety of products available that allow users to interact with their devices using only their voice. For example, many smartphones have built-in voice recognition systems that allow users to make calls, send messages, or control other functions using voice commands. There are also more technical voice recognition systems, similar to dictation software, which can transcribe spoken words into written textbooks in real-time, and voice-controlled virtual sidekicks, similar to Siri and Alexa, which can perform a wide range of tasks, similar as setting monuments, playing music, and answering questions.

Voice recognition technology has the potential to revolutionize the way we interact with technology, making it more natural, intuitive, and accessible. However, it is important to note that speech recognition technology is still far from perfect and can be impacted by factors such as background noise, accent, and language. Despite these challenges, voice recognition technology continues to improve and is poised to play an increasingly important role in the future of human-computer interaction.

A web application that combines both eye tracking and voice recognition technology would allow users to control a mouse cursor using either their eye movements or their voice, providing a highly versatile and accessible way of interacting with a computer. By using eye tracking, users could interact with the application by simply gazing at the desired location on the screen, allowing them to perform tasks such as clicking on icons, typing, and scrolling. Voice recognition technology could be used to provide additional input options, allowing users to control the application using voice commands.

The combination of eye tracking and voice recognition technology in a single web application would provide users with greater flexibility and independence and would be particularly beneficial for individuals with disabilities or mobility limitations. For example, a user with a physical disability that makes it difficult to use a traditional mouse could use eye tracking to control the cursor, while a user with a speech disability could use voice recognition to provide input. Such an application would likely be developed using a combination of eye tracking and speech recognition APIs, along with programming languages such as JavaScript and HTML. The challenge in developing such a web application would be to create a seamless and intuitive user experience, taking into account the different requirements of both input methods and ensuring that the application is able to effectively combine the two technologies.

Overall, a web application that combines both eye tracking and voice recognition technology has the potential to be highly innovative and could provide a valuable solution for people with disabilities or mobility limitations, making it easier for them to interact with technology and improve their quality of life.

II RELATED WORKS

The interaction between humans (the users) and computers plays an important role in today's life. Input devices such as keyboards, mice, etc. are the normally used devices to interact with digital instruments, this device cannot be operated by disabled people. Lee, et al.[1,9] Method for controlling device on the basis of eyeball motion, and device therefor, IEEE Trans, Vol. 38, Nov (2020). The proposed system can give all mouse click events and keyboard functions. In this method, the camera mouse system along with the timer acts as left click event and blinks as right-click event.

Thomas Huang, et al.[2] Face as Mouse through Visual Face Tracking, International Journal of Engg Research and App., Vol. 2, Apr (2020). The proposed method detects features from the face. A simple face-tracking system was developed. Face images can be analyzed without ever requiring any interaction with the user/person. Thus there is a need to find a method that spreads an alternate way for making communication between the human and computers the individuals who have impairments and give them an equivalent space to be an element of the Information Society.

Mohamed Nasor, et al.[3] "Eye-controlled mouse cursor for a physically disabled individual." Advances in Science and Engineering Technology International Conferences (ASET), 2020. IEEE, 2020.By accurately detecting the position of the iris in the eye and mapping that to a specific position on the computer screen, the algorithm enables physically disabled individuals to control the computer cursor movement to the left, right, up, and down. The algorithm also enables the person to open and close folders or files or applications through a clicking mechanism. The disadvantage of this system is that it can only handle long blinks and is not able to handle short blinks. In the case of short blinks it just simply avoids the blinks.

PROPOSED SYSTEM

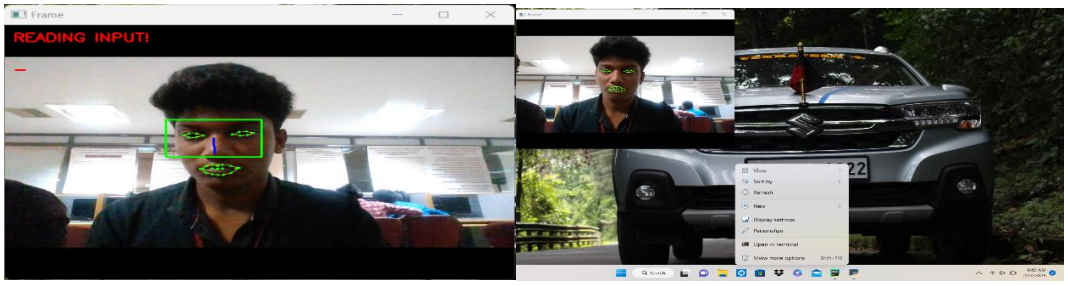
The camera receives input from the eye. After receiving these streaming videos from the camera, it will break into frames. After receiving frames, it will check for lighting conditions because cameras require sufficient lights from external sources otherwise error message will be displayed on the screen. Images (frames) from the input source focusing the eye are analyzed for Iris detection (center of the eye). The second step is to find the exact position of the iris within the eye window. Mapping the iris to a point in the video from the scene camera. Using pre-determined calibration points, the position of the iris is mapped to a position on the screen. After this, a mid-point is calculated by taking the mean of the left and right eye center points. Finally, the mouse will move from one position to another on the screen based on the movements tracked. For example, if you just close and open your right eye, then the right-click operation of the mouse is performed. In such a way, the mouse cursor movements and other operations of a mouse are done. Then we have also implemented a speech recognition technique and selenium library to identify the voices of users

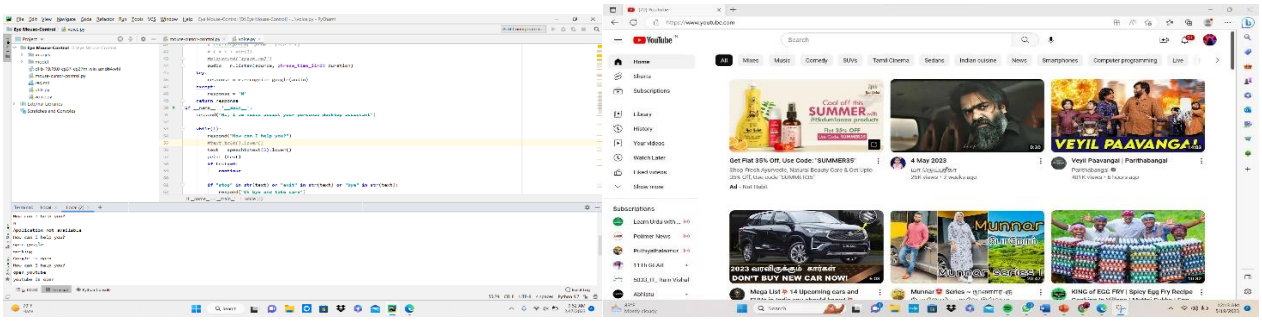
WORKING PRINCIPAL

Gaze estimation can provide important natural computer interface cues and can be used in head-mounted display (HMD) environments. This new gaze estimation is based on her 3D analysis of the human eye. There are several commercial products that utilize gaze recognition technology. This method allows the user to estimate the viewpoint by simply pointing at the points to be calibrated. By detecting and tracking facial features such as the eyes and the tip of the nose, it circumvents the traditional human facial mouse movements that humans interact with computers. This method is applicable to a wide range of facial scales.

III SIMULATION RESULT

This section presents the simulation output of the proposed system of mouse cursor control based on facial movement and voice recognition is showed below





VII CONCLUSIONS

The goal is to make the user interact with the computer naturally and conveniently by only using their eye, we provide an eyetracking-based control system. We also implemented a speech recognition technique and selenium library to recognize the voice and open relevant application which helps physically challenged people. The system combines both mouse functions and keyboard functions. So that users can use our system to achieve almost all of the inputs to the computer without traditional input equipment. The system not only enables disabled users to operate the computer the same as normal users do but also provides normal users with a novel choice to operate a computer.

REFERENCE

1) *Jun-Seok, Kyung-hwa Yu, Sang-won Leigh, Jin-Yong Chung, and Sung-Goo Cho. "Method for controlling device on the basis of eyeball motion, and device therefor." U.S. Patent 9,864,429, issued January 9, 2020*
2) *"Thomas Huang, Jilin Tu, Elect and Comp EngrDept, Hai Tao, ElectEnggDept, "Face as Mouse through Visual Face Tracking", IEEE, 2022.*
3) *Mohamed Nasor, Mujeeb Rahman K K, Maryam Mohamed Zubair, Haya Ansari, Farida Mohamed. "Eye-controlled mouse cursor for a physically disabled individual." February 2018.*
4) *Caceres, Enrique, Miguel Carrasco, and Sebastian Rios. "Evaluation of an eye-pointer interaction device for human-computer interaction." Heliyon 4.3 : e00574, 2020..*
5) *Jie-Shiou Tsai, Chang-Hong Lin" Gaze direction estimation using only a depth camera." 2018 3rd International Conference on Intelligent Green Building and Smart Grid (IGBSG). IEEE.*