Face Mouse For Amputees [Arms-Less People]

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Abstract: There is undoubtedly room for improvement in the realm of recruiting given modern technological breakthroughs in this electronic age. Today, hands-free enrollment is well known for monitoring the requirements for quadriplegics. The Human PC Cooperation (HCI) system is presented in this study as a fundamental tool for people with disabilities and those who abhor using their hands. The created system is an eye-based interface that functions maybe as a computer mouse to decipher eye enhancements like flashing, staring, and squinting toward mouse cursor activities. The system under discussion makes use of a necessary webcam, and its item requirements include Python (3.6), OpenCv, numpy, and two or three different packs that are crucial for face verification. The HOG (Histogram of organised Gradients) include near to a straight classifier, or substantial learning estimates (cnn) and the sliding window process, can be used to create the face finder. There are no hands needed, and no additional equipment or sensors are needed.

Keywords: Human Computer Interaction [HCI], Convolutional Neural Networks [CNN], Histogram Of Oriented Gradients [HOG].

I. INTRODUCTION

With today's technology, moving the cursor around the screen with the computer mouse or by moving the finger has become increasingly frequent. The technology tracks any mouse or finger movement and translates it to cursor movement. Some persons, referred to as "amputees," who are unable to use their arms will not be able to use the current technology to use the mouse. Therefore, if the eyeball can be tracked and the direction it is gazing in can be established, the eyeball movement can be translated to the cursor, allowing the amputee to move the cursor as they choose. An amputee will benefit greatly from a "eye tracking mouse." The eye tracking mouse is currently not widely accessible, and only a few companies have created and made this technology available. The majority of mouse functionalities will be available in a mouse that is based on facial landmarks and eye tracking so that the user can move the pointer with his face. By closing the right or left eye, click operations are performed while attempting to estimate the user's "gaze" direction and moving the cursor in that direction.

II. LITERATURE SURVEY

The face mouse was new concept. It start when the image processing starts, in other words it start when the face recognition/detection begins. After the face recognize can we implement the face mouse. The new thought was started. Because after face it start to identify the eye, facial movements etc.so the face mouse will help the amputees. In this busy days no one will help other or no one will make time for other. In that time it will help for other. Even those who are having hand even they can use this face mouse. we can control the cursor movement of mouse by face. So it work as face mouse.

[1] Cursor Movement Control Using Eyes and Facial Movements for Physically Challenged People-2021 by Pavithra S, Rakshitha K, Ramya V, Vikas Reddy S**.:** With the help of the method we've described here, people can interact with computers without using their hands. Generally speaking, a new method that makes use of human face emotions and features has replaced the mouse that people previously utilised. It employs a variety of image processing techniques, including face detection, eye extraction, and real-time interpretation of an eye blink sequence, to control a non-intrusive human computer interface.

[2] Operating Computer Cursor using Eye and Face Movements-2021 by U. Chaitanya : Hands-free Human Computer Interaction (HCI) solutions have advanced significantly since the development of contemporary human computer interfaces. The goal of this research is to provide a methodology that will make it easier for persons with physical limitations, such as quadriplegics and amputees, to control computer cursors.

[3] Facial Movements Based Mouse Cursor Control For Physically Disabled Individuals-2021 by Guguloth Bhargavi : People who are physically challenged make up a significant portion of our society but do not currently have access to the same possibilities for inclusion as other members of the society. To ensure their participation in the new technologies, it is vital to create easily navigable systems. The goal of this project is to introduce new technology to

persons with disabilities.

[4] Controlling Mouse Motions Using Eye Tracking Using Computer Vision-2020 by Kshitij Meena : In order to enable hands- free contact between people and computers, this study offers an algorithm to perform mouse-like functions. It offers an alternative to the conventional computer mouse.

[5] Face_Cursor Movement Using Open Cv-2020 by D. Lakshmi Sai Swetha : Some people's illnesses prevent them from using computers. The concept of eye controls is very beneficial for both the development of natural input and, more crucially, for the disadvantaged and handicapped. Additionally, by including a controlling system, they are able to operate the computer independently.

[6] A Fuzzy Logic based Approach for Replacing Mouse by Facial Expressions for People with Disability in Movement -2020 by Pradeep V : For those with disabilities in the movement who have not yet had a fair chance to use the typical input devices of a personal computer, many authors have put forth replacements for the mouse during the past three decades. The overhead of employing head-mounted devices is decreased in camera-based systems by using the web camera as the mouse.

[7] Facial Expression Based Computer Cursor Control System for Assisting Physically Disabled Person-2020 by M. Vasanthan : Several academics have been working on creating various sorts of assistive technology for people with physical disabilities recently. In this study, the cursor movement in computer applications is controlled by the movement of illuminant markers through facial expressions.

[8] Design and Development of Hand Gesture Based Virtual Mouse-2019 by Kabid Hassan Shibly : Since the development of computer technology, the method of creating a process of interaction between a human and a computer is advancing.

[9] Eye-Controlled Mouse Cursor for Physically Disabled Individual-2018 by Mohamed Nasor : The algorithm makes it possible for people with physical disabilities to direct the movement of the computer cursor to the left, right, up, and down by precisely identifying the location of the iris in the eye and translating that to a particular point on the computer screen.

[10] Mouse Handling Using Facial Features-2015 by Neha Nikhade : The interface between people and the computers they use is crucial in supporting the various ways in which man interacts with technology. In recent years, new approaches to human-computer interaction (HCI) have been created.

[11] Development of a Computer Interface for People with Disabilities based on Computer Vision -2015 by Gustavo Scalabrini Sampaio and Maur´ıcio Marengoni : The global population of people with impairments must increase together with research into and development of solutions that assist these users with fundamental computer tasks. The creation of a system that enables the operation of personal computers using just facial motions is discussed in this study.

[12] Facial Expression Based Computer Cursor Control System for Assisting Physically Disabled Person -2012 by M. Vasanthan : Several academics have been working on creating various sorts of assistive technology for people with physical disabilities recently. In this study, the cursor movement in computer applications is controlled by the movement of illuminant markers through facial expressions.

III.   PROPOSED HYBRID MODEL

In [figure 2] it tells how the face mouse work, how to activate or de-activate the mouse cursor. Right eye is work as right button. Left eye is work as left button. When we turn the face with different direction the cursor will work. For example if we turn our head to right then the cursor will move towards right like that it work. We scroll the page by using this. In [figure 2] it tells how the program work. It first detect the face or it recognize the face ,then it detect the eye part because the eyes work as right and left button for this face mouse. After this process it start to work as face mouse. It use CNN and pyautoGUI for working. The pyautoGUI is a python library which helps in GUI for recognize and movement of the face. In [figure1] it tells CNN it recognize or detect the face, it make the frames then it identify the face.
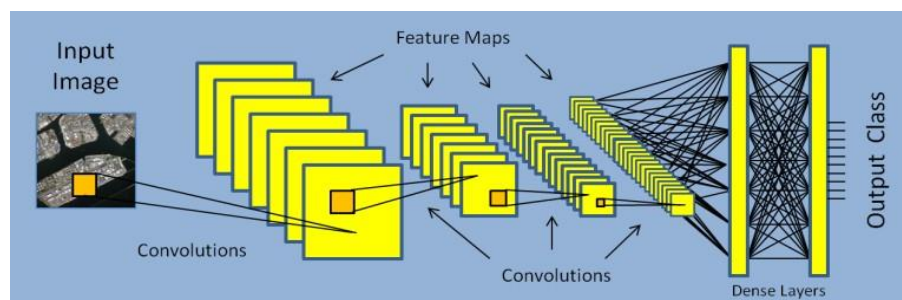

Figure 1The structure of a convolutional neural network (CNN).
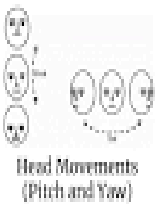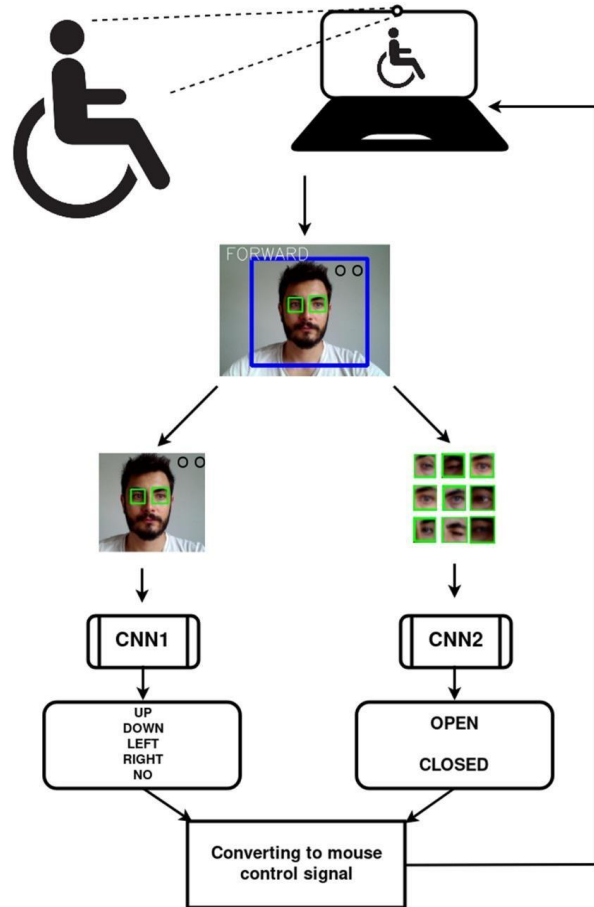
Figure 2 Introduction

Figure 3 System Architecture

IV. EXPRIMENTAL RESULTS

The face mouse will work in this different forms. Here the face mouse will work with some amount of light and with good camera. Compare to older it work little fast and it work for less mega pixel camera. And less light too. The working of the face mouse can be understand by this sample images.

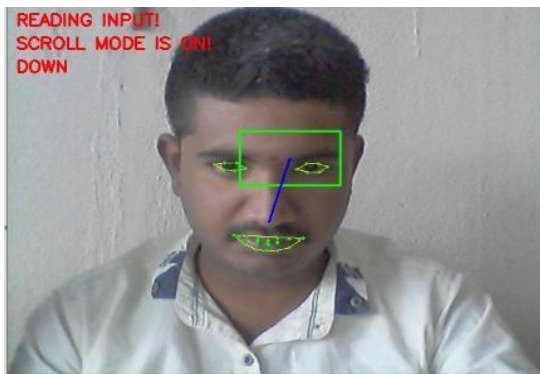**Sample Image**

Figure 4 For active and de-active the mouse
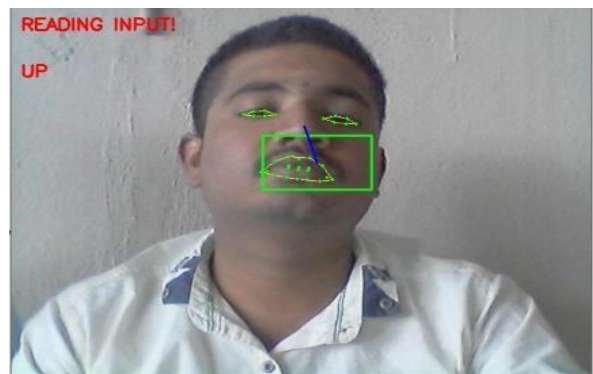
Figure 5 Scroll Down
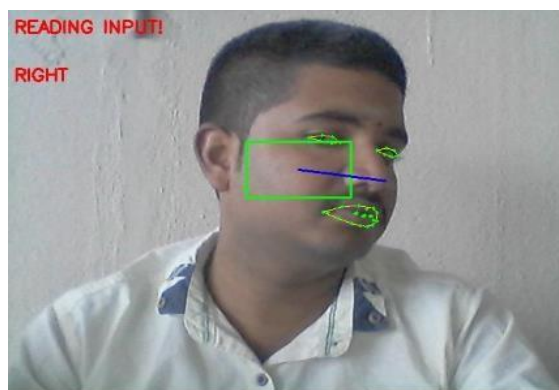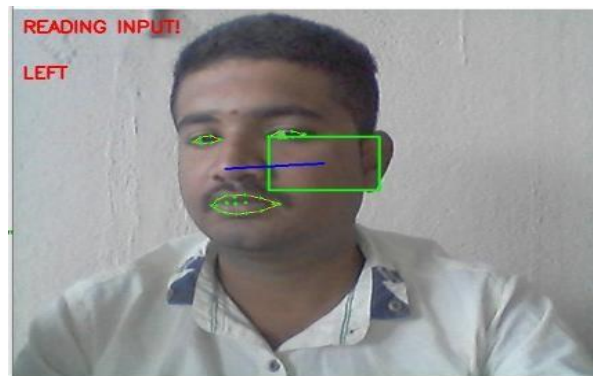

Figure 6 Scroll Up

Figure 7 Scroll Right

Figure 8 Scroll Left

V. CONCLUSION

I have successfully completed Human computer interaction based eye controlled mouse using artificial intelligence without any flaws, the system is tested in all the environments and works fine. The project helps disabled people to use computer without having physical mouse, the system perform all the mouse operations like right click , left click , scroll in x y directions. The previously it work upto 38% but now with the support of pyautoGUI and all it work upto 45%-48%.

In future the technology can create big boom and can replace physical device with artificial intelligence. For future to bring that level of interaction between human and computer we need to work more on ,how to make the work or movement of cursor faster, whether it work with less mega pixel and less light.

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