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EYEBALL MOVEMENT BASED WHEEL CHAIR CONTROL USING OPENCV AND NODEMCU

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Abstract — The main aim to this paper is to Provide a system to paralyzed people they can travel by in wheel chair independently without need any another Person. In Previous System they are giving remote control type of wheel chair controlling system is present in wheel chair. But this system is not much helpful for all the paralyzed people, because handicapped people unable to move their hands freely. So, we go for some alternative solution is to Provides an eyeball-based wheel chair control. Camera Connected to the PC running python will capture the Eye ball and it fix the centroid of the eye based on the centroid we track the position. Then the different variation on pupil position get different command set for wheelchair. The signals pass the motor driver to interface with the wheelchair itself. The motor driver will control both speed and direction to enable the wheelchair to move forward, left, right and stop.

I. INTRODUCTION

Some people are not able to operate computer because of an illness. The idea of eye controls of great use to not only the future of natural input but more importantly the handicapped and disabled. Moreover, implementing a controlling system in it enables them to operate computer without the help of another person. It is more helpful to handicapped people. Those are need to operate wheel chair without hands this one is most useful. Those can operate by movement of eye. In this paper Camera is capturing the image of eye movement. First detect pupil centre position of eye. Then the different variation on pupil position gets different movement of chair. The Implementation process for Pupil detection using Node MCU and python IDLE / Anaconda Prompt.

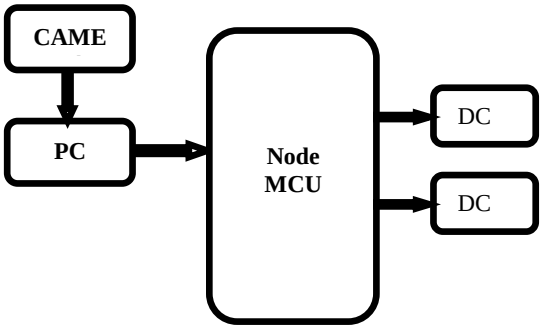
II. EXISTING SYSTEM

In existing system they are giving remote control type of wheel chair controlling system is present in wheel chair. But this system is not much helpful for all the paralyzed peoplesbecause handicapped peopled unable to move their hands freely. So, we go for Brain computer interface based on the eye blink it moves that direction accordingly. It also has some limitation. The person must be always wearing brain wave sensor, also sensor is powered by battery this need to be changed periodically. If battery power goes down the sensor will not work properly and might give error values.

III. PROPOSED SYSTEM

In order to overcome the limitation in existing system we go for alternative method is Eyeball based wheel chair control. In this method camera is focused on the eye by using OpenCV we need to find out the centroid of the eyeball. By tacking the eyeball movement, we can move the wheel chair accordingly. It is very useful for Elderly and disabled people who needs guidance to live.

IV. BLOCK DIAGRAM:



BLOCK DIAGRAM EXPLANATION

In this block diagram the whole system is controlled by Atmeag328 IC and this processor is implemented on Arduino Uno Board. So, this board is connected with monitor, PC camera. Those all components are connected by USB Cable. Arduino is the key element in processing module which keeps on monitor's eye movement by interfacing PC camera. Camera is capturing the image of eye

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movement. PC Cameras ideal for many imaging applications. Python will be use laptop, then the install python IDLE and open cv on PC. Fist image will be capture by Camera. Focus on eye in image and detect the centre position of pupil by open cv code. Take the centre position value of pupil as reference, and then the next the different value of X, Y coordinates will be set for particular command.

HARDWARE

- Node MCU
- PC camera
- DC motors
- Motor driver

SOFTWARE

- Programing platform: arduino IDE, python3 IDLE
- Programming language: python3, Embedded C

ADVANTAGES

- High accuracy
- Havdicapt people can operate computers

APPLICATIONS

- BIO-GADGETS applications

V. CONCLUSION

This paper has presented a wheelchair system using eye movements, in which pupil detection that is segmentation is done in which pupil looks is decided by fixing range to the particular direction as user looks. Detection of pupil is done even on illumination unless the illumination is covering whole eye, this is because when the light hits the pupil and illumination spreads on the pupil covering whole pupil which ignores those pixels so as we treat the illumination spots it will leave behind a maximum change edges that cannot be determined and the operator will consider another position to be an iris location. This process works even if image taken in little dark environment.

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