A Survey And Study Of Research In Prevention Of Computer Vision Syndrome

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Abstract:
Use of computers is increasing day-by-day. Computer Vision Syndrome(CVS) is a disease caused due to continuous use of computers. Prolonged usage of computer causes CVS because of the light emitted through the computer screen.In this paper we are surveying research papers concerning Computer Vision Syndrome and how we can take precautionary measures against this disease. This paper takes a gander at the recent research work done relating to CVS and Computer Vision.This paper gives the reader a perspicacious understanding about CVS and the ways to reduce its impact.

Keywords: Computer Vision.,Computer Vision Syndrome , Eye Blinks.

I. Introduction:

Computer Vision Syndrome (CVS) is widely growing in computer user community. This is caused due to looking or string at digital display for longer period of time. This results in decreased rate of eye blinking. This disease results into some symptoms like dizziness, headache , blurred vision etc.Technological efforts needs to be taken to reduce the impact of CVS on our eyes. Various computer vision libraries can be used to analyze this error.With the help of different algorithms we can calculate the users current blinking rate and compare it with average human blinking rate and we can take precautionary measures against it. In this paper we are studying the research work done regarding this common objective of ours. We will survey and study the outcomes of different paper by researchers who have done their research in the field of Computer Vision.

II. Related Work:

There are various algorithms with the help of which we can deduce the eye blinking rate of a person using only webcam. These algorithms include Canny edge detection algorithm,Direct pixel count, Laplacian of Gaussian, etc.[1].Canny edge detection algorithm detects edges like upper eyelid, lower eyelid and pupil while eye is ope and while it is closed it show only upper and lower eyelid[1].Researchers have proposed a self developing algorithm to detect eye blinking rate and display message through a pop-up prompting user to blink their eyes more often.This mwthod has measure limitation of low light usage as it performs poor in lighting constraint environment[1].

Another research work suggests to calculate the eye blink rate through Eye Aspect Ratio(EAR) algorithm[3].This method is heavily based on facial landamrk detection. In this method EAR is calculate using facial landmarks at eyelids and eye edges.When EAR falls under certain threshold value in a subsequent video frame a blink is recorded.This method deals with low light comparitively better. This algorithm may perform poorly in case unusual head orientation[3] but since we are targetting this to Computer users chances are rare as most of the people are in their usual straight position while using computers.The method presented in research work uses regression based facial landmark detectors.

III. Propsed System:

In our system we are implementing EAR algorithm and we will be adjusting the brightness according to the eye blinking rate. We will also prompt user about 20-20-20 rule[4] after every 20 minutes so they can follow if they want.As EAR algorithm performs better under low light situation and has better accuracy than Canny edge detection algorithm we have chosen EAR as our main algorithm to detect eye blinking rate. Whenever the users eye blinking rate falls below threshold value we will decrease the screen brightness.

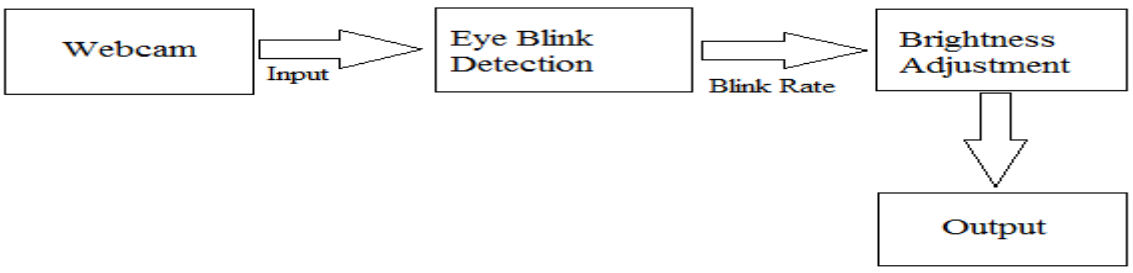

Figure 3.1: System Architecture

IV. Conclusion:

Studying from the research we can implement a system with the help pf suitable algorithm that help users of computer to identify their blinking rate and adjust the screen brightness accordingly which will help them not in preventing CVS but in reducing the impact of CVS for better health of their eyes

References:

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