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FINAL YEAR PROJECT REPORT

EYE GAZE-BASED INTERACTION WITH PERSONAL COMPUTER

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EYE-GAZE-BASED INTERACTION WITH PERSONAL COMPUTER

ABSTRACT

A human-computer interface (HCI) system designed for use by people with severe disabilities is presented. People that are severely paralyzed or afflicted with diseases such as ALS (Lou Gehrig's disease) or multiple sclerosis are unable to move or control any parts of their bodies except for their eyes. A vision-based human-computer interaction is obtainable. The interface senses involuntary eye blink and interprets them as control commands. The system presented here detects the user's eye blinks and analyses the pattern and duration of the blinks, using them to provide input to the computer. If the user's depth changes significantly or rapid head movement occurs, the system is automatically reinitialized. There are no lighting requirements nor offline templates needed for the proper functioning of the system. The system works with inexpensive USB cameras. Experiments will conducted to determine both the system's accuracy in classifying voluntary and involuntary blinks, as well as the system's fitness in varying environment conditions, such as alternative camera placements and different lighting conditions. It can also be used in entertainment factors like games [25]. The planned system is very relaxed to arrange and use. It is completely non-intrusive and it only needs one low-cost web camera and workstation.

TABLE OF CONTENTS