

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“Jnana Sangama” Belagavi – 590 010



PROJECT REPORT ON “EYE-BLINK DETECTION SYSTEM FOR HUMAN COMPUTER INTERACTION”

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING IN ELECTRONICS & COMMUNICATION ENGINEERING

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**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
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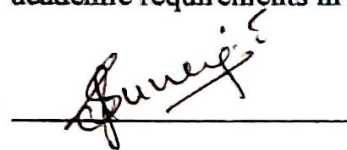
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CERTIFICATE

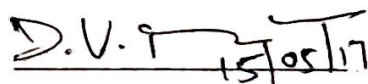
Certified that the project work entitled **"EYE-BLINK DETECTION SYSTEM FOR HUMAN COMPUTER INTERACTION"** is a bona fide work carried out by

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in partial fulfillment for the award of BACHELOR OF ENGINEERING in ELECTRONICS & COMMUNICATION ENGINEERING of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2016-2017. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the Bachelor of Engineering Degree.



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ABSTRACT

The developments of computers have made human life more comfortable. The Human-Computer Interaction (HCI) involves the study, planning, and design of the interaction between people (users) and computers. This project aims at the development of a portable and cost effective wireless eye movement-controlled HCI, which can be used for the disabled who have motor paralysis and their hands cannot be used in multiple applications, so a vision-based HCI is depicted in this project. The interface detects voluntary eye blinks and interprets them as control commands. The employed image processing methods include Haar-like features for automatic face detection, and template matching based eye tracking and eye-blink detection.

A HCI framework that is de-marked for people with serious inabilities to recreate control of a conventional machine mouse is presented. The cam based framework, screens a client's eyes and permits the client to simulate clicking the mouse utilizing deliberate blinks. A user friendly HCI for severely movement impaired persons should fulfil several conditions: first of all, it should be non-contact and avoid specialized equipment, it should feature real-time performance, and it should run on a consumer-grade computer.

The system, capable of processing a sequence of face images of small resolution (320 x 240 pixels) with the speed of approximately 30 fps, is built from off-the shelf components. The components are a consumer-grade PC or a laptop and a medium quality webcam. The proposed algorithm allows for eye-blink detection, estimation of the eye-blink duration and interpretation of a sequence of blinks in real time to control a non-intrusive HCI. The results show that the proposed system works efficiently and produces an error rate that allows it to be used as part of HCI. Thus, the system provides a flexible and cost effective method for the disabled to improve the quality of life.