MAHARAJA AGRESEN INSTITUTE OF TECHNOLOGY

DEPARTMENT OF INFORMATION AND TECHNOLOGY

A MINOR PROJECT SYNOPSIS 2018

IRIS RECOGNITION USING STANDARD CAMERAS

Submitted By

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INTRODUCTION

This project evaluates the use of off-the-shelf standard cameras for biometric identification of the human iris. As demands on secure identification are constantly rising and as the human iris provides with a pattern that is excellent for identification, the use of inexpensive equipment could help iris recognition become a new standard in security systems. To test the performance of such a system a review of the current state of the research in the area was done and the most promising methods were chosen for evaluation.

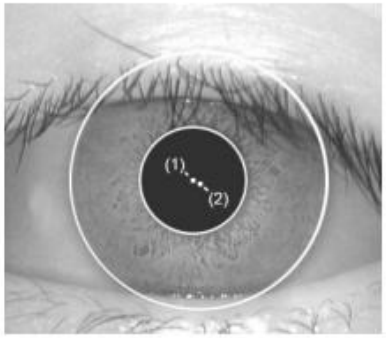
A test environment based on open source code will be constructed to measure the performance of iris recognition methods, image quality and recognition rate. In this project the image quality of a database consisting of images from a standard camera is assessed, the most important problem areas identified, and the overall recognition performance measured. Iris recognition methods found in literature are tested on this class of images. These together with newly developed methods show that a system using standard equipment can be constructed. Tests show that the performance of such a system is promising.

PURPOSE

The purpose of this report is to evaluate the use of standard cameras for IR, localize and grade the problems that arise when imaging in non-ideal imaging situations using existing iris processing methods found in literature as well as newly developed methods based on general image processing methods. In short, the aim of this report is to answer the two questions: Is the image quality of standard equipment adequate for the purpose? Are there methods for IR robust enough to work under these circumstances?

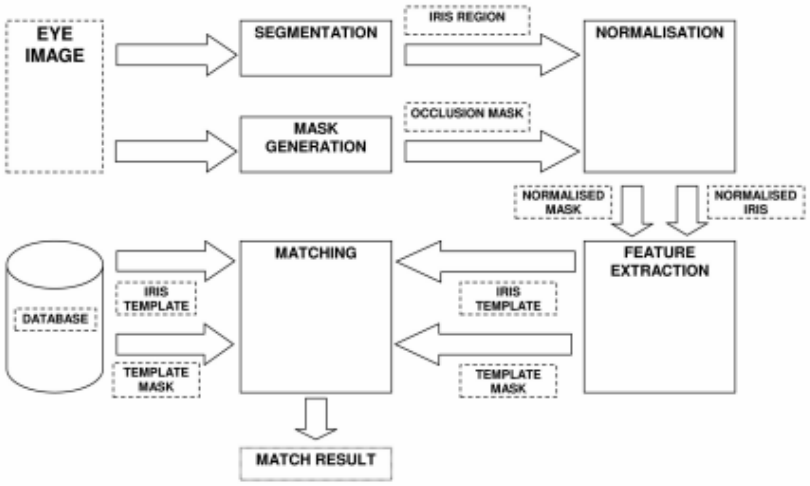
OBJECTIVE & SCOPE

All iris recognition systems found in literature are based on specialized hardware, imaging the eye under favorable conditions. As imaging technology is rapidly becoming cheaper and the quality of off the shelf cameras is constantly rising, the idea behind this thesis is to look into the possibilities of making iris recognition an inexpensive and widespread technology using cheap imaging devices in less restrictive imaging situations.



When imaging the iris under less-than ideal conditions artifacts in the image occur such as different types of noise and reflections from light sources, artifacts that introduce errors in the iris recognition process influence the performance and must be taken in consideration when designing IR systems.

METHODOLOGY

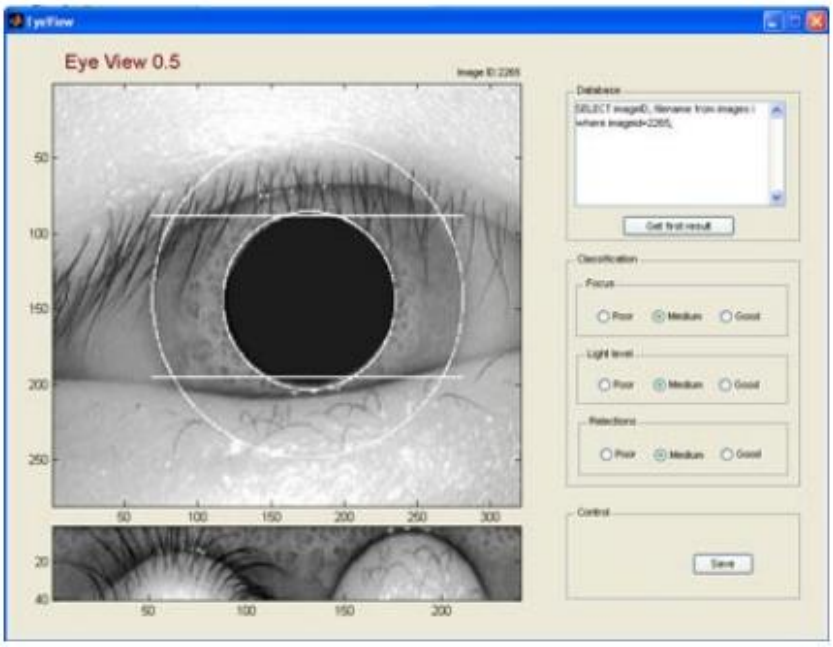


IRIS RECOGNITION METHODS

1. IR Process
2. Segmentation
3. Normalisation
4. Mask Generation
5. Encoding and Matching
6. Proposed new method for Segmentation

HARDWARE & SOFTWARE TO BE USED

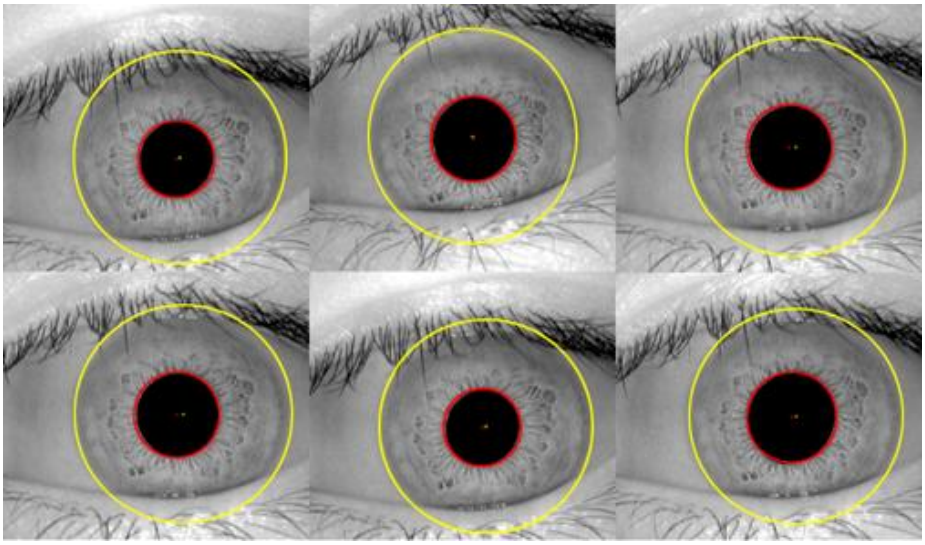
The project based on Iris Detection will be developed on Matlab and other various API's depending upon the usage and foundational data collection needed in the application processing.



Other elements may include various other Hardware such as standard cameras and various hand held devices for retracing and reevaluating the data result sets.

THE SCHEDULE OF THE PROJECT

As far as the presented goals are concerned they are fulfilled. Image quality from standard cameras would be sufficient for IR purposes and robust methods have been found or developed. Only one matching method was evaluated and the exact safety of an IR system based on standard equipment was not assessed, but neither finding the optimal matching method or the performance of an actual system was the goal of this project.



This project has shown that an IR system can be constructed using standard camera equipment and presents methods that work under these circumstances. The real life performance of such a system was not assessed as that would have required the construction and evaluation of the actual iris imaging that is not discussed in this synopsis. To construct such a system would be an interesting project indeed and would give rise to new problems and interesting solutions. If such a project give a fruitful result, IR recognition could soon be much more common than it is today. It would also be interesting to investigate the use of more encoding and matching methods to perhaps improve recognition rate. A system for automatic assessment of image quality and image device control to improve the imaging is another interesting project.

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