FACE RECOGNITION USING EIGENEYES

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ABSTRACT

As continuous research is being conducted in the area of computer vision, one of the most practical applications under vigorous development is the face recognition system. Face Recognition is an emerging field of research with many challenges such as large set of images and improper illuminating conditions. Eigeneye approach is considered to overcome these obstacles in developing a system for Face Recognition.

There are various techniques used for processing the image in order to handle bad illumination and face alignment problem. In this project, the Eigeneye approach is used for face recognition.

This project is conducted to compare an unknown eye structure to a known subject's eye and face recognition is achieved if the unknown eyes match with that of known trained eyes. The face recognition utilizes cropped images are to render a two-dimensional representation of a human eye area. The system then projects the image onto an 'eye space' that best encodes the variation among known eye images. The eye space is defined as the 'eigeneyes', which are eigenvectors of the set of eyes. The framework provides the ability to learn to recognize new faces in an unsupervised manner.

Eigeneyes are eigenvectors of covariance matrix, representing given eye image space. In this project, a large set of eye images from a group of known faces are trained, and an unknown eye images are used for testing. Euclidean Distance is used to compute minimum distance and this will determine whether the input eye image match with the eye images in the training set. This technique of face recognition is able to recognize whether the test eye images are human faces. When the maximum value is around 6+e003 and the minimum value is more than 4+e003.

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

Currently, a continuous research is conducted in the area of computer vision, and one of the most practical applications under vigorous development is in the construction of the face recognition system. With the recent case of children being kidnapped in this country, there have been increasingly significant interests in the development of intelligent surveillance cameras and CCTV in the public area that can automatically detect and recognise known criminals as well as suspicious characters. Due to such uncertain times, the community begins to seek support from computer systems to aid in the process of identification and location of faces in everyday scenes. Smart buildings can be implemented whereby the presence of unknown and doubtful individuals can be brought to the attention of building security for appropriate action, and smart computers can be used to load personal preferences and needs.

While solutions to the task of face recognition have been presented, recognition performances of many systems are heavily dependent upon a strictly constrained environment. The problem of recognising faces under gross variations remains largely unsolved. This thesis addressed the issue of developing a face recognition system under reduced constraints. The design of the face recognition system is based upon "eigeneyes". The application of eigeneyes to face recognition's task requires a perfectly standardised and aligned database of faces.

Due to this, normalization is performed to enable the system to do the recognition with reduced constraints in the position and orientation of the face, as well as the illumination and background of the image. The recognition is performed under single scaled images without rotation.