Biometric Identification based on Face and Iris Recognition

Utku ÖZCAN – Edanaz PEKDEMİR – Tolga ÖZALP

Dr. Gül TOKDEMİR
Assistant Prof. Reza ZARE HASSANPOUR

Çankaya University, Department of Computer Engineering

Abstract

Biometrics is a process of recognizing an individual by using his/her unique characteristics. This project aims to identify an individual based on his/her face and iris. The system will perform biometric security check using biometric measurements. It will take the measurements of iris and face and will compare them to the entire database of registered individuals who are eligible to access a certain folder in the system.

Introduction

Face and Iris recognition system still has some shortcomings like illumination, external factors, so we offer a high-level security system which is the Biometric based on Face and Iris Recognition for a company who want to save their information from a hacker or information theft. The company should identify chosen workers to the security system according to document while using their iris and face pattern on the database. After registration done, only chosen workers can access the high-level secret documents, if iris and face recognition can be done correctly. We are using Phase-based method for Iris recognition which is the fastest and reliable algorithm for working security system process and it is also more accurate than any other descriptors and it is independent of rotation, luminance, and scale, so its acceptable level is higher than other algorithms, we are using Principal component analysis (PCA) for face recognition. Also, the acceptable level of Face and Iris recognition can be adjustable according to company's request.

Acknowledgement

We would like to express our special thanks of gratitude to our advisor Dr. Gül TOKDEMİR and co-advisor Assistant Prof. Reza ZARE HASSANPOUR to do this Senior project on the topic Biometric Identification based on Face and Iris recognition, which also helped us in doing a lot of Research and came to know about so many new things we are really thankful to them.

Solution

For Iris Recognition Phase-based method presents an efficient algorithm using phase-based image matching – an image matching technique using only the phase components in 2D DFTs (Two-Dimensional Discrete Fourier Transforms) of given images. The technique has been successfully applied to high accuracy image registration tasks for computer vision applications, where estimation of sub-pixel image translation is a major concern. The use of Fourier phase information of iris images makes possible to achieve highly robust iris recognition in a unified fashion with a simple matching algorithm. Experimental performance evaluation using the CASIA iris image database ver. 4.0 clearly demonstrates an efficient matching performance of the proposed algorithm.
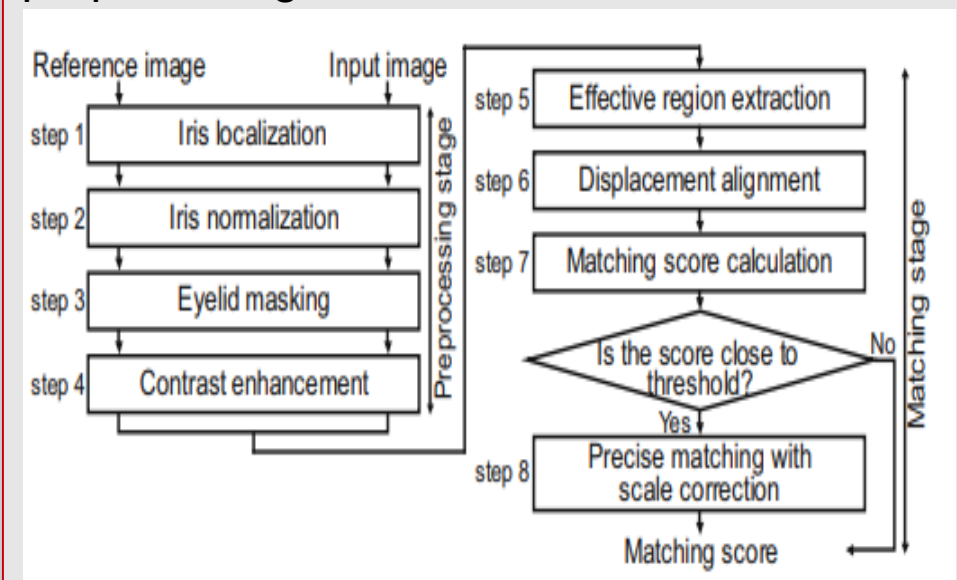

Figure 1 – Flow Diagram of Iris Recognition

For Face Recognition Principal component analysis (PCA), the main goal of a PCA analysis is to identify patterns in data; PCA aims to detect the correlation between variables. If a strong correlation between variables exists, the attempt to reduce the dimensionality only makes sense. In a nutshell, this is what PCA is all about: Finding the directions of maximum variance in high-dimensional data and project it onto a smaller dimensional subspace while retaining most of the information.
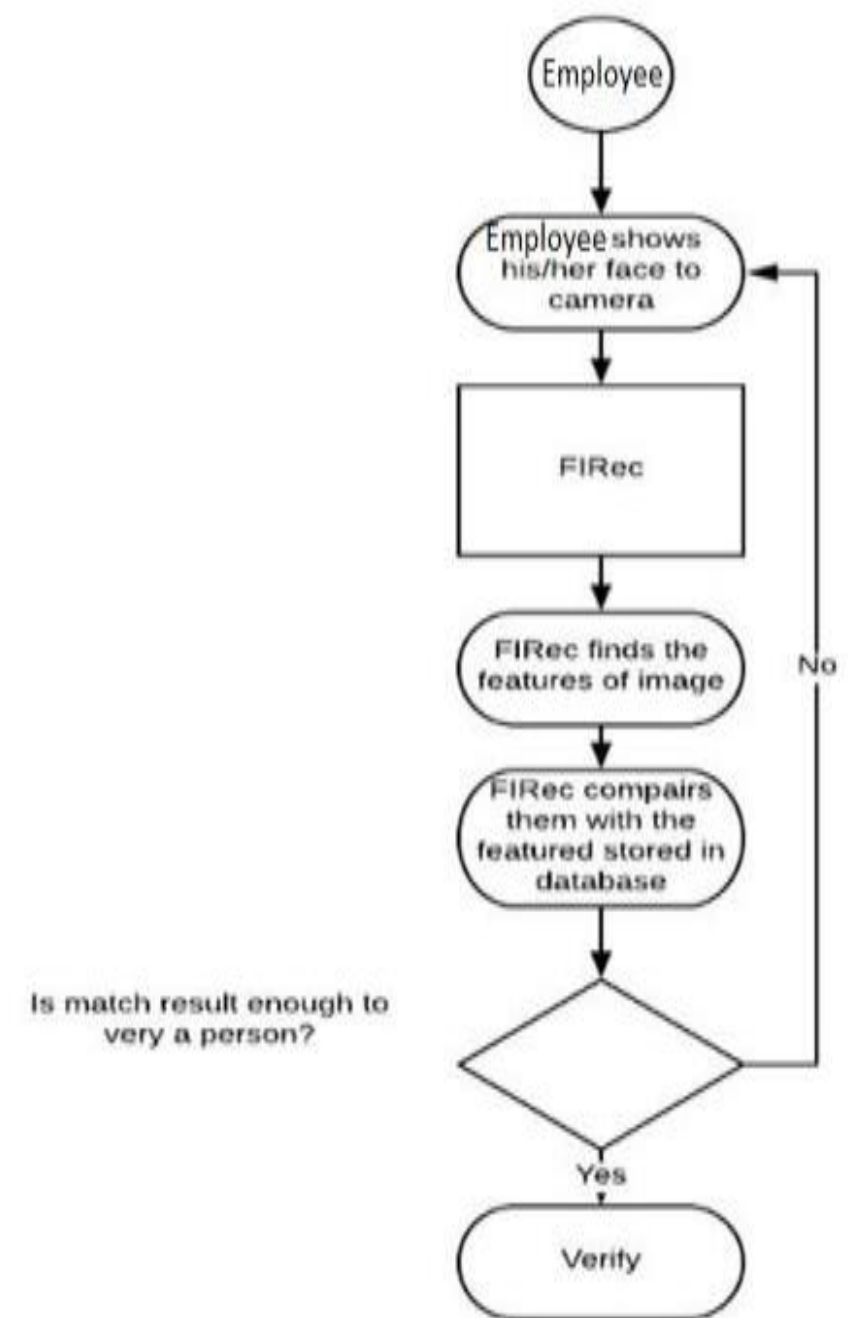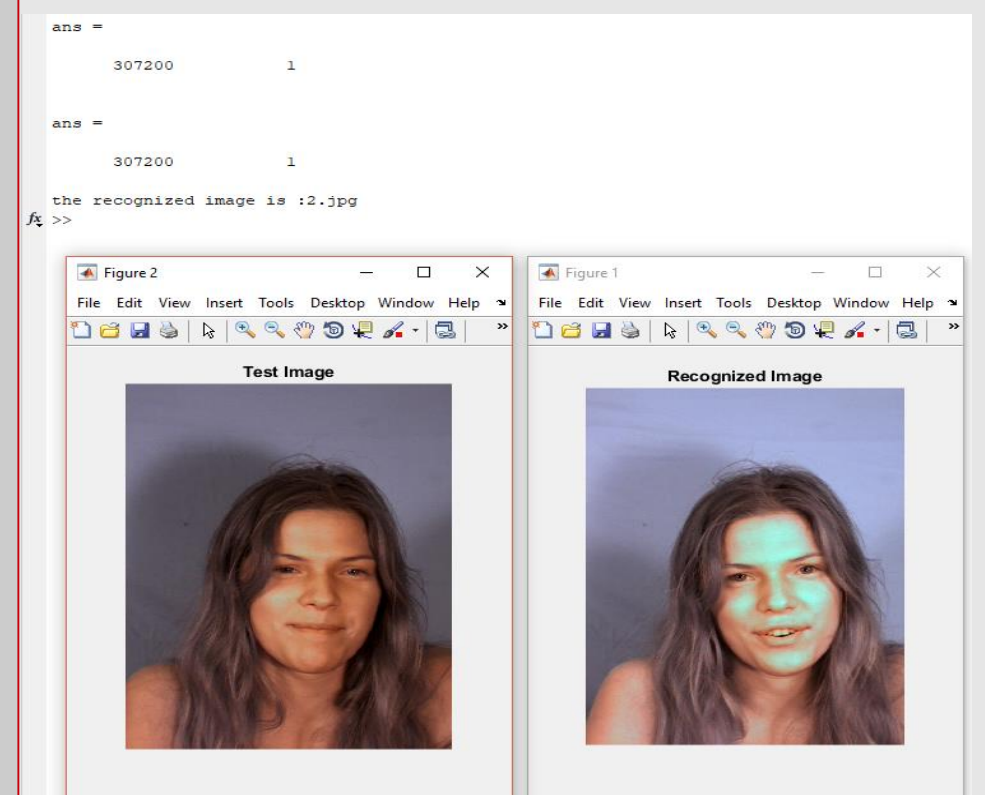

Figure 2 - Flowchart

Results & Conclusion

Figure 3 – Result of Face Recognition

Figure 4 – Result of Iris Recognition