Introduction

Algorithms of face recognition have long been researched and are maturely developed. However, the issue becomes intractable when these algorithms are implemented on an embedded platform which has comparably low computation power.

In our project, a face recognition algorithm on a portable device (an embedded platform) is implemented. A input image will first be captured by the digital camera and is processed by the face recognizer and the search engine. Information will be displayed to the user through the video eyeglasses interface.

The face recognition algorithm in this project is mainly divided into three parts: face detection, face extraction and face recognition.

The algorithm is implemented on two embedded platforms and is compared with a implementation in a paper called “Characterization of visual feature recognition”.

Aims and Objectives

The project objective is to implement face recognition in an optimum way in terms of run time onto the embedded system. Various algorithms and methodologies are studied and hardware resources planning will be done to achieve the goal.

This kind of face recognition embedded system can be widely used in our daily life in different sectors. We hope that human life can be greatly helped with this technology. Some typical applications are listed as follows.

Methodology

Face recognition algorithms flow chart

Face recognition algorithms are mainly divided into three parts. The face recognition algorithms flow chart is shown in the following figure.

User Interface

Face recognition mode (left): face recognition function is performed directly. Input function mode (right): new record for a person can be added to the database.

Acknowledgements

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References

1. Characterization of visual feature recognition
2. Embedded Platform
3. Face recognition algorithms flow chart
4. User Interface
5. Acknowledgements

Results

Run time comparison 1:

- Comparison of face recognition algorithms on two different embedded platforms.
- Devkit8000: NA, 0.011s
- Successful rate: 0.999, 99.9%
- Successful rate: 0.999, 99.9%
- Reduce database setup time: 70.4%
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Success rate test:

A test on the successful rate is done with 104 test faces, which are different from the 35 faces stored in the database. Threshold is set to identify the unmatched face. With the threshold is set at around 2400, a successful rate over 70% can be achieved.

Conclusion

The face recognition algorithms are successfully implemented on the embedded platform. In addition, a face recognition software application with a friendly user interface is designed and the new display interface—the video eyeglasses—is used to display. This provides user with a totally new experience.

To summarize, four major goals of the project have been achieved. They are:

- An effective face detection and recognition algorithm that can be run on embedded platform with acceptable run time.
- A face recognition software application with a friendly user interface.
- An embedded system running the face recognition software application.
- The video eyeglasses display interface.