A Study on Facial Recognition System

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Abstract: A facial recognition system is a computer-driven application for automatically identifying or verifying a person from a digital still or video image. It does that by comparing selected facial features in the live image and a facial database. This project is a stimulation of DCT. The stimulation based on the police in Tamp Bay, Florida used to search for potential criminals and terrorists in attendance at the event. This project is completely based on graphic processing and rendering. The project requires study about the Vector Algebra as the Algorithm Eigen faces as dependent on a set called Eigen Vectors. Some mathematical terms used in this project are Principal Component analysis, Covariance Matrix.

Key words: Automatically identifying · Digital still or video image · Stimulation of DCT

INTRODUCTION

Mirror Technologies: Mirror tech has in depth expertise in developing embedded and real time software for various domains, including Multimedia, Automotive, Networking, Telecom and Wireless. We specialize in Systems Design, Custom Software Development, Firmware and Driver Development [1-5]. Mirrortech has delivered projects using most of the popular Embedded System chips and Operating Systems.

Our strength in Embedded Systems Software and skills in Hardware Design and Development makes us an ideal partner for product development and R&D [6-7]. SFO as a group is capable of handling the entire development cycle from concept and prototype development to product roll out and manufacturing.

Existing System: There are many face recognition systems that are available today in market. These systems are based on different algorithms such as Local DCT, Eigenfaces, LDA, Bayesian etc., but all these systems are restricted to the environment at specific lighting conditions. Many of these systems cannot recognize the faces that are not in proper position. The position of the face also makes a major role [8]. These systems cannot recognize the face in 3d.

Proposed System: The proposed system can be capable of identifying the faces in different lighting effects. It can also find the solution in the 3d face. This is based on the most popular algorithm called eigenfaces. This algorithm yields 86.5% accuracy. Even though Local DCT is giving 93.1% accuracy we are considering the eigenfaces because of its ability to consume less computer resources like processing power and storage space [9]. We required to sacrifice 6.6% of accuracy which is negotiable.

Module Description:
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- Local DCT Implementation Module
- User Interface Module
- Graph Generation Module
- Comparison Module
- Decision Module

Local DCT Implementation Module: This module will take care about the implementation of the popular Local DCT algorithm. This will take the data from the user interface. This modules is built under the core java. This algorithm will provide 83.9 percent accuracy in getting the details of the 3d face. The algorithm was modified such that it can detect the face in different lightning conditions.

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User Interface Module: This module is an implementation of the admin user panels. This module is completely built using java swing components. These components includes, command buttons, list boxes, panels. It also takes care about the data validations. This also includes the showing of the frames that are currently monitoring [10-11].

Graph Generation Module: This modules will analyze the images and generates the graph based on the images analysis[11]. The graph shows the frequency of relativity between the current image and stored images. Comparison Module.

This module compares the data from the graph with the data that is stored in the system profiles. This module is capable of identifying the exact faces that matches with the current image. Decision Module.

This module will take the decision to store the data into the system based on the events. The events will be stored with the time stamp if the comparison module will give the positive result. It will be ignored if it gives a negative result.

CONCLUSION

The system developed in this project is to identify the persons and verifying them depending upon the particular features in their faces like eyes and etc, in their faces, by comparing with features stored in live images of the users. It is very useful in many applications such as identifying the criminals and unidentified victims in accidental incidents.

Future Enhancements: In future can be capable of identifying the faces in different lighting effects. It can also find the solution in the 3d face. Even though Local DCT is giving 93.1% accuracy we are considering the eigenfaces because of its ability to consume less computer resources like processing power and storage space. We required to sacrifice 6.6% of accuracy which is negotiable.

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