

FACE RECOGNITION SYSTEM

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ABSTRACT:

The face is one of the easiest ways to distinguish the individual identity of each other.

Face recognition is a personal identification system that uses personal characteristics of a person to identify the person's identity. Human face recognition procedure basically consists of two phases, namely face detection, where this process takes place very

rapidly in humans, except under conditions where the object is located at a short distance away, the next is the introduction, which recognize a face as individuals. Stage is then replicated and developed as a model for facial image recognition (face

recognition) is one of the much-studied biometrics technology and developed by experts. There are two kinds of methods that are currently popular in developed face recognition pattern namely, Eigen face method and Fisher face method. Facial image recognition Eigen face method is based on the reduction of face dimensional space

using Principal Component Analysis (PCA) for facial features. The main purpose of the use of PCA on face recognition using Eigen faces was formed (face space) by finding the eigenvector corresponding to the largest eigenvalue of the face image. The area of this project face detection system with face recognition is Image processing Face

recognition has been one of the most interesting and important research fields in the past two decades.

1. Introduction

1.1 Aim:

The project 'Face Recognition System' is to determine the similarity and differences between two face in order to assess a request.

The Defense Advanced Research Projects Agency (DARPA) and the National Institute of Standards and Technology rolled out the Face Recognition Technology (FERET) program beginning in the 1990s in order to encourage the commercial face recognition market.

1.2 literature survey:

In this present time with the advances of PC vision are effectively creating, with their assistance, we can tackle issues all the more adequately, one of which is acknowledgement. With the evolution in the field the designers get countless libraries to take care of issues related to PC vision. work center around the hypothetical part of building a steady framework for face acknowledge. Face recognition is also one of the most successful applications of image analysis and understanding. Because of the nature of the problem of face recognition, not only computer science researchers are

interested in it, but neuroscientists and psychologists are also interested for the same.

this direction us to handle with a huge image database and focus on the new algorithms which are more real-time and more efficient with maximum percentage of accuracy.

Efficient and effective recognition of human face from image databases is now a requirement.

1.3 Research Gap:

Face Recognition has always been one of the most fascinating and intriguing technologies as it deals with human faces. As said, opportunities and challenges go hand in hand. Growing commercial interest for face recognition is encouraging, but it also turns out to be a challenging endeavour when it comes to problems associated

which have played continuously with its quality of delivery. These challenges arise when the situations are non-cooperative and causes the varied facial appearance/expressions.

2. Material and methods:

2.1. Materials:

In this report, we focus on image based face recognition. Given a picture taken from a digital camera, we'd like to know if there is any person inside, where his/her face locates at and who he/she is.

Techniques and algorithms on face detection method are:-

- Knowledge based methods
- Feature invariant approaches
- Template matching method
- Appearance based method
- Part based method

2.2. Procedure:

Towards this goal, we generally separate the face recognition procedure into three steps:

- Face Detection,
- Feature Extraction
- Face Recognition.

2.3. Reliability of the project:

Do you think face recognition systems are safe to use?

According to research published in April 2020 by the Centre for Strategic and International Studies (CSIS), facial recognition systems have nearly absolute precision in ideal conditions, reaching a 99.97% recognition accuracy level. Facial recognition technology has improved dramatically over the past few years. In the latest round of testing conducted by the National Institute of Standards and Technology (NIST) in March 2020, showed that the best face identification algorithm had an error rate of just 0.08%. In 2014, the leading algorithm had an error rate of 4.1%

3. Result and discussion:

3.1. Discussion between past based method and our proposed method:

Past based method:

With the development of the graphical model framework and the point of interest detection such as the difference of Gaussian detector (used in the SIFT detector) and the Hessian affine detector, the part-based method recently attracts more attention.

We'd like to introduce two outstanding examples, one is based on the generative model and one is based on the support vector machine (SVM) classifier.

Our proposed method:

In our previous work, we adopt the top-down method to detect faces in an image. We first classify pixels into skin color or non-skin color, and then find candidate face regions based on connected component algorithm. We discard small regions with fewer skin-color pixels, and verify the remained regions based on the most fitted ellipse.

Regions have higher overlapping with its fitted ellipse are remained for further verification. Important and invariant facial features (ex. Eyes and mouths) are extracted from each candidate face region, and we test the relation among these feature points as well as their constellation and orientation against the face region. Finally, those candidate regions pass our heuristic testing procedure are determined as detected faces. Our method suffers from the hard decisions between each block. Each block discards parts of the candidate

regions, while these regions may have positive responses in the later blocks. Besides, our face detection relies on the well-defined skin color classification and facial feature extraction detection, which may not work well in complicated scenes. To solve these problems, we'd like to make these blocks parallel or exploit more robust features for detection.

Future work:

Face recognition technology has been widely used in security and financial fields because of its convenience. With the rapid development of science and technology, the application of faces will be more developed, and the application scenarios will be more diverse. However, face recognition will easily cause technical, legal, and ethical problems. Due to the automated features of face recognition technology, similar related information may be processed or decided through automation, lacking transparency and not easy to supervise, and even in the event of errors or discrimination. It is difficult to trace back. For example, the face recognition information is used to achieve non-recognition purposes such as judging an individual's sexual orientation, race, or

4. conclusion:

Face recognition systems are part of facial image processing applications and their significance as a research area are increasing recently. Implementations of system are crime prevention, video surveillance, person verification, and similar security activities.. The goal is reached by face detection and recognition methods. Knowledge-Based face detection methods are used to find, locate and extract faces in acquired images. Implemented methods are skin color and facial features. Neural network is used for face recognition. RGB color space is used to specify skin color values, and segmentation decreases searching time of face images. Facial components on face candidates are appeared with implementation of LoG filter. LoG filter shows good performance on extracting facial components under different illumination conditions. With the development of science and technology, the face recognition technology has made great achievements, but there is still room for its improvement in practical application. In the future, there may be a special camera for face recognition, which can improve the image quality and solve the problems of image filtering, image reconstruction. We can also use 3D technology to supplement 2D images to solve some problems such as rotation and occlusion.

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