

Face Recognition and Detection using Python

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ABSTRACT

In human beings an individual's identity can be identified through face. Face recognition can identify the gender of the individual and also its personal identity. The emotion recognition will be identifying the emotions of the human beings. Any human being can capture an emotion of an individual, either verbally or face to face. Human face recognition consists of two phases – first is detection which takes place rapidly in humans and second is introduction which will recognize the face of an individual. In this paper, we will identify the face of any human being with his/her expressions using Python programming language.

1. INTRODUCTION

Facial emotions are crucial part for human beings to communicate with each other. Emotions can vary from face to face respective of every individual. They can be anger, sad, happy, neutral, surprise, fear. This work will be done by using python language for which we also need to download numpy and opencv. The result displayed will be the face of the one who is holding the device and will recognize the face expression accordingly. There has been interest in human emotion recognition in various fields including, but not limited to, human-computer interface [1], animation [2], medicine [3], [4] and security [5]. This can be divided into two parts- first part is introduction and second is proposed work, under which we have face recognition, face detection and emotion recognition. Adding emotions is an extra feature will can be added on later after detecting and recognizing the face.

2. PROPOSED WORK

2.1 Face Recognition

There are two main approaches for face recognition

2.1.1 Geometric

Here face features like nose, ears, mouth are first located according to the geometric angles and distances between features.

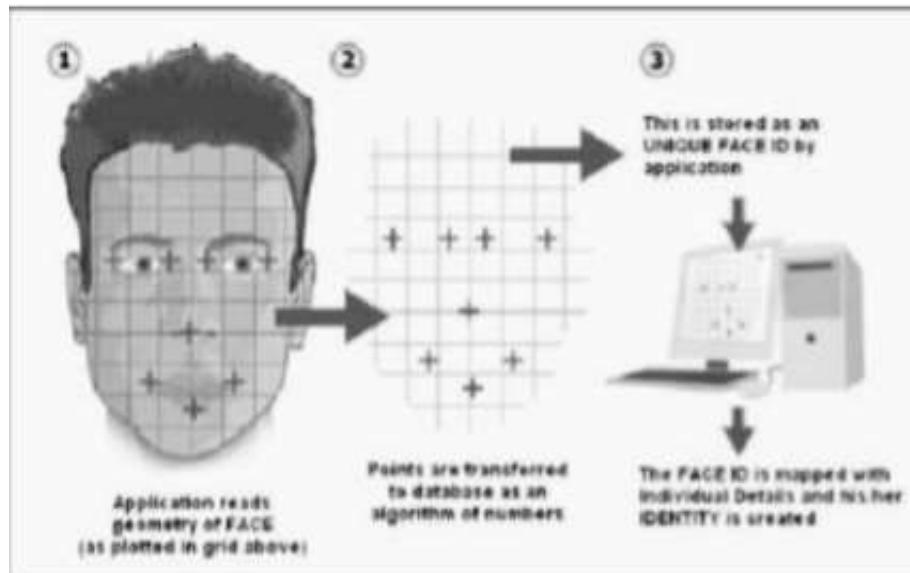


Fig. Geometric

2.1.2 Photometric Stereo

Number of images is taken at a time under lightning conditions. Popular recognition algorithms are-

- Principal Component Analysis using Eigenfaces, (PCA)
- Linear Discriminate Analysis,
- Elastic Bunch Graph Matching using the Fisherface algorithm.

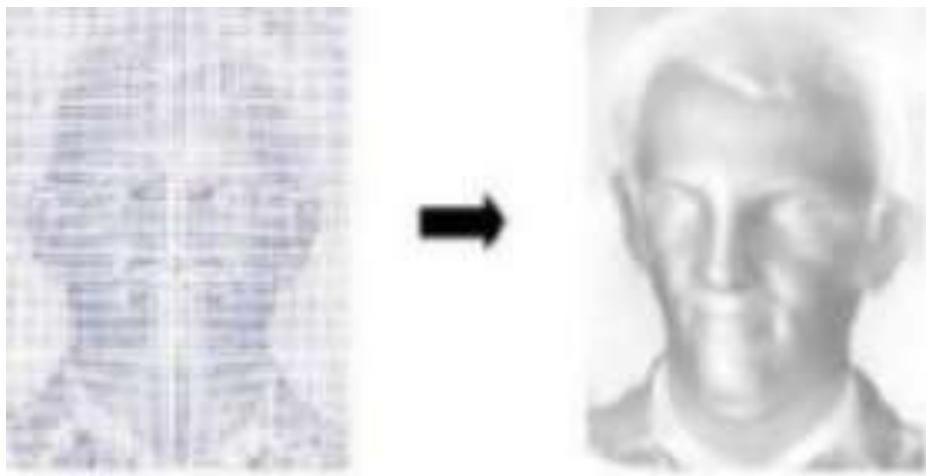


Fig. photometric stereo

2.2 Face Detection

Face detection is somewhat difficult because there are certain factors that are taken into consideration which are skin color, age of an individual, gender etc. The face detection system is divided into three steps which are as follows:

- Pre-Processing: The images are processed before they are feed into the network then to avoid variability, all better-looking images are cropped and then the cropped images are processed using different algorithms.
- Classification: The purpose of this is to classify the faces and non faces of a human being, indicating whether the individual's face is properly detected or not.
- Localization: It will search an image. Various Feature of Face on which the work has done:- Position Scale Orientation Illumination.

2.3 Emotion Recognition

In this work, emotions that will be detected on human face are happy, sad, anger, surprised, fear, disgust. Expressing emotions are very common nature in human beings. These can be done verbally or non-verbally on the face of a humans. People vary widely in their accuracy at recognizing the emotions of others. A key point is when learning about automated emotion recognition there are several sources of "ground truth," or truth about what the real emotion is.



Suppose we are trying to recognize the emotions of Alex. One source is "what would most people say that Alex is feeling?" In this case, the 'truth' may not correspond to what Alex feels, but may correspond to what most people would say it looks like Alex feels. For example, Alex may actually feel sad, but he puts on a big smile and then most people say he looks happy.

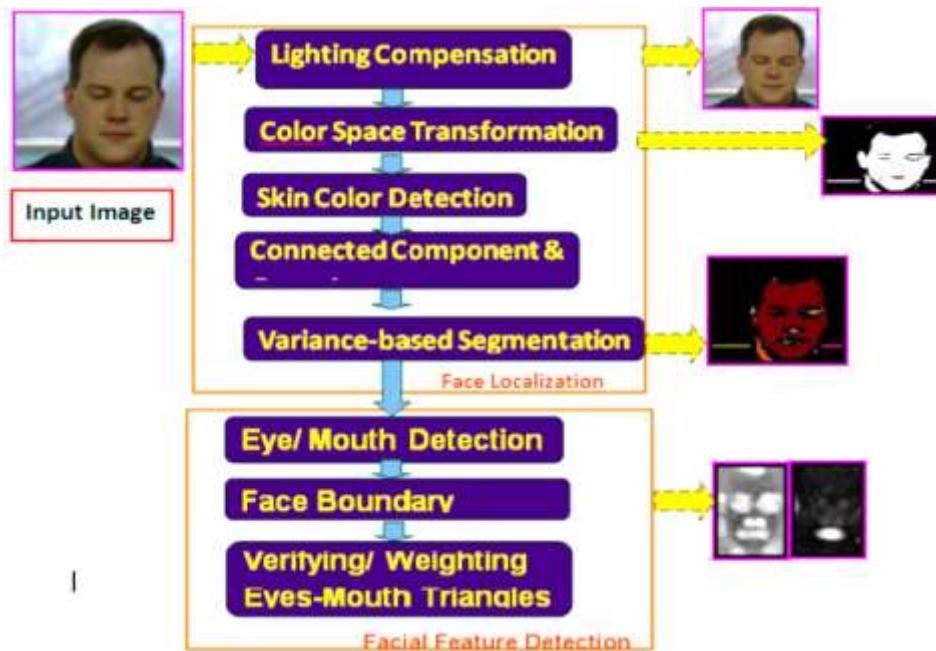


Fig. face detection algorithm

3. CONCLUSION

This paper gives a brief idea of how human face is recognized and detected even with expressions of various kinds. The proposed work gives a good idea for recognizing and detecting of a human face. Face detection is a bit difficult task but using this algorithm mentioned in this paper it becomes a bit easy work. The deep features can represent the face features better than the handcrafted features. In future we can extend this and apply the deep neural network-based classification to further improve the performance of this project.

4. REFERENCES

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