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Abstract

A facial feature classification technique that independently captures both the geometric configuration and the image detail of a particular feature is described. Facial information is processed by our brain in such a way that we immediately make judgments about, for example, attractiveness or masculinity or interpret personality traits or moods of other people. This research addresses the problem of measuring the size of these effects for five facial features (nose , mouth , ear). Our proposal is a mixed feature-based and image-based approach that allows judgments to be made on complete real faces in the categorization tasks, more than on synthetic, noisy, or partial faces that can influence the assessment. The main objective of this work was to measure the effect size of each basic facial feature (e.g., two specifics eyes, a particular nose, a mouth, etc.). To examine the influence of the appearance of each facial feature on the facial traits, we need a set of faces assessed by several observers with respect to the facial traits to be analyzed.The detailed results of each analysis for the effect of facial features on facial traits can be consulted. The overall results are statistically significant for all facial trait.

Guide Name & Signature with Date

Reviewer Name & Signature with Date

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CHAPTER-1

Introduction

Facial landmark detection has been an active area of research due to a multitude of potential applications includ-ing face recognition and facial expression analysis. Numerous methods have been proposed, most of which follow alearning-based approach using appearance or geometric constraints. Face recognition is technology measures and matches the unique characteristics for the purpose of personal identification to apply in many applications such as face recognition system at airport, patient identification, access control and so forth. Sometimes in traditional methods, face recognition misses matching because there are invariance factor resulted from human pose, hairstyle, acne arising, fatter etc. Hence face recognition based on facial geometric landmarks was developed. These algorithms must provide at least a 95% successful recognition rate, out of which less than 3% of the detected features are false positives. Humans have highly developed their ability to perceive faces and to process the information extracted from them. The fusiform face area and the posterior superior temporal sulcus are a specialized neural network of our brains able to identify people; guess their gender, age, or race; or even, judge the emotions and intentions of the owners of the faces. Through this behavioral capacity to

perceive faces, we use the facial appearance to make attributions such as personality, intelligence, or trustworthiness .

Visual perception research has shown that the human brain processes faces in a different way to other kind of objects *Part-based* perceptual models suppose that objects are processed on the basis of their components or parts although it is commonly agreed that this is the way in which we process most objects, faces are thought to be processed in a different way. In *relational* models of perception, basic face features are processed in a part-based way, however, the perception relies heavily on the variations in the positioning of and the spacing between these basic features. *Holistic* perceptual models integrate facial features into a gestalt whole when the human brain processes facial information (holistic face processing The holistic models do not exclude part-bas ed processing from the global holistic face perception process, and some part of the perception relies on part-based processing of fact.

The main objective of this work was to measure the effect size of each basic facial feature (e.g., two specifics eyes, a particular nose, a mouth, etc.) on the opinion of the observers about some of the whole face traits. Hereinafter, we will consider a face trait as any judgment that an observer can make about the physical characteristics of the face (e.g., attractiveness, masculinity/femininity, etc.) or about the emotional state of the face owner (e.g., sadness, happiness, fear, etc.). It is important to remark that we are considering each facial feature as a whole. For example, in this study, we consider the global appearance of

the noses more than specific characteristics like dimensions

or shapes.

Our secondary objective was to obtain models that predict the facial traits of faces from the combination of facial features that conform them. There are interactions between the facial features during face recognition tasks. However, regarding the facial traits assessment, although interactions between the features also exist, a more direct relationship with specific facial features can be established. For example, larger eyes, higher eyebrows, and smaller noses are perceived as baby-faced, and faces with some of these features are also perceived as baby-faced.

Tools and Technology Used

Install Anaconda

- Package of multiple libraries and IDEs
- IDEs
    - Jupyter notebook
    - Spyder
    - VSCode

Install these libraries (we need to install after anaconda being installed)

- Opencv
    - Pip install opencv-python

CHAPTER-2
Literature Survey

Problem Definition

Face recognition has many challenges due to illumination variations, large dimensionality, uncontrolled environments, aging and pose variations. In the recent years, Face recognition get remarkable improvement and accuracy to overcome these challenges, but matching in the heterogamous environment such as near infrared and visible spectrum is very challenging task. Matching of face images capture in near infrared spectrum (NIR) to face images of the visible spectrum (VIS) is a very challenging task. In this paper we study earlier research work to find challenges in the cross spectral face recognition model.

Proposed Solution

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What the Future Holds?

The future of facial recognition technology is bright. Forecasters opine that this technology is expected to grow at a formidable rate and will generate huge revenuesin the coming years. Other areas that are now welcoming it with open arms are private industries, public buildings, and schools. It is estimated that it will also be adopted by retailers and banking systems in coming years to keep fraud in debit/credit card purchases and payment especially the ones that are online. This technology would fill in the loopholes of largely prevalent inadequate password system. In the long run, robots using facial recognition technology may also come toforay. They can be helpful in completing the tasks that are impractical or difficult forhuman beings to complete.

CHAPTER-3

Methodology / Implementation

To examine the influence of the appearance of each facial feature on the facial traits,we need a set of faces assessed by several observers with respect to the facial traitsto be analyzed. On the other hand, the features of the faces must be classified by the similitude of their appearances. Our faces express emotions by changing the shapeof their features. Observers can judge if the observed person's current emotionalstate is happy, angry, or sad based on these changes. For example, the owner of asmiling face looks happy but bored or tired if the face is yawning. Regardless of the expression, people make social trait inferences based on the facial appearance offaces in a neutral state. These inferences are not related to an instantaneous emotional state, although they are driven in part by their structural resemblance toemotional expressions .In this way, a neutral face can elicit in the observer sensations such as happiness, sadness, or dominance. The face's owners can seem tobe happy people although they are not smiling or laughing. In this work, we areinterested in these facial traits that are not related to the instantaneous emotionalstate of the faces. For this reason, we used only neutral faces in our study, without expressions or deformations of the facial features. Our faces express emotions by changing the shape of their features. Observers can judge if

the observed person’scurrent emotional state is happy, angry, or sad based on these changes. For example,

the owner of a smiling face looks happy but bored or tired if the face is yawning.

Regardless of the expression, people make social trait inferences based on the facial appearance of faces in a neutral state. These inferences are not related to an instantaneous emotional state, although they are driven in part by their structural resemblance to emotional expressions .In this way, a neutral face can elicit in the observer sensations such as happiness, sadness, or dominance. The face's owners can seem to be happy people although they are not smiling or laughing. In this work, we are interested in these facial traits that are not related to the instantaneous emotional state of the faces. For this reason, we used only neutral faces in our study, without expressions or deformations of the facial features

The eye-detection algorithms focus on the detection of the frontal human eye. The Python OpenCV library functions are mainly aimed at real-time computer vision. It is mainly used to do all the operations for image processing as well as detect objects. OpenCV already contains many pre-trained classifiers for faces, eyes, smiles, etc**.**

RESULT AND OUTPUT:

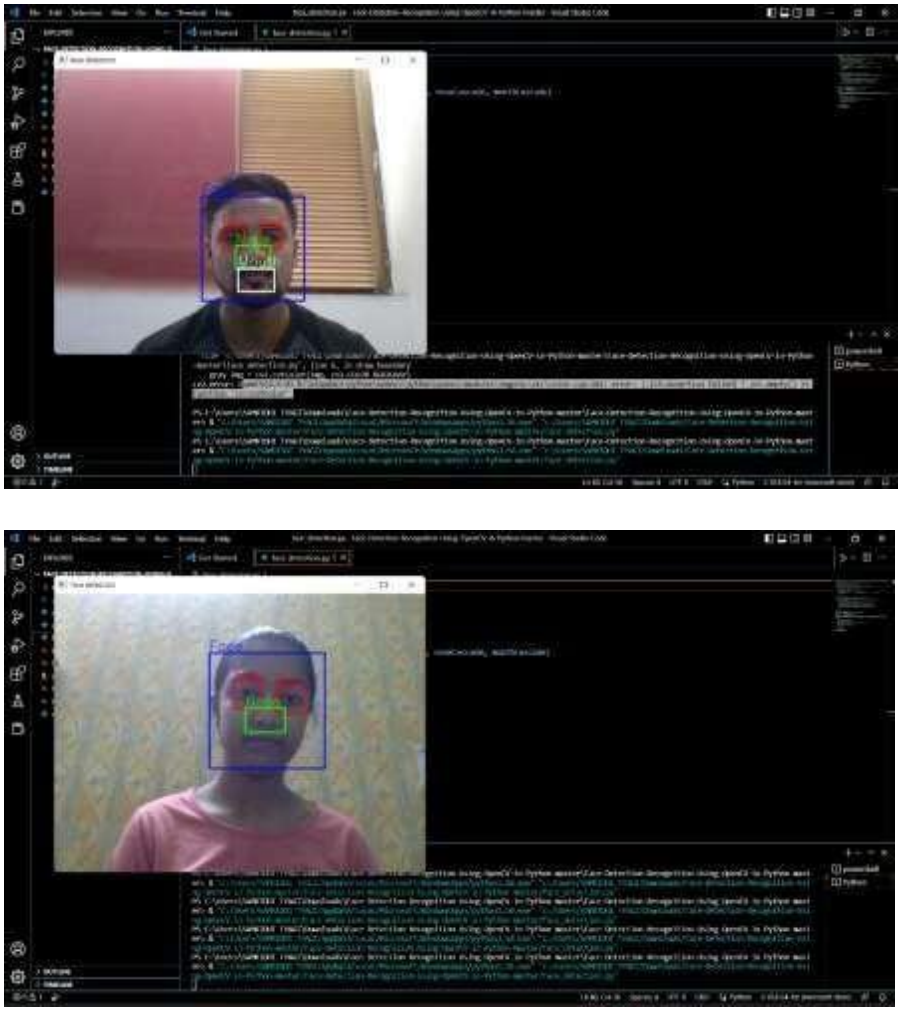

Fig. 2.1

CONCLUSION

To improve the recognition performance, there are MANY things that can be improved here, some of them being fairly easy to implement. For example, you could add color processing, edge detection, etc. The main objective of this work was to measure how much the appearance of the facial features affects the opinion of the observers about some facial traits.

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CANDIDATE'S DECLARATION

I/We hereby certify that the work which is being presented in the thesis/project/dissertation, entitled **"FACE DETECTION MODEL"** in partial fulfillment of the requirements for the award of the B.TECH submitted in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an original work carried out during the period of September, 2022 to December, 2022, under the supervision of Mr. A. Boobalan Assistant Professor, Department of Computer Science and Engineering/Computer Application and Information and Science, of School of Computing Science and Engineering , GALGOTIAS COLLEGE OF ENGINEERING AND TECHNOLOGY, GreaterNoida

The matter presented in the thesis/project/dissertation has not been submitted by me/us for the award of anyother degree of this or any other places.

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This is to certify that the above statement made by the candidates is correct to thebest of my knowledge.

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