

Image Processing Facial Expression Recognition

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Abstract- These Human facial expressions convey a lot of information visually rather than articulately. Facial expression recognition plays a crucial role in the area of human-machine interaction. Automatic facial expression recognition system has many applications including, but not limited to, human behavior understanding, detection of mental disorders, and synthetic human expressions.

Recognition of facial expression by computer with high recognition rate is still a challenging task. Two popular methods utilized mostly in the literature for the automatic FER systems are based on geometry and appearance. Facial Expression Recognition usually performed in four-stages consisting of pre-processing, face detection, feature extraction, and expression classification.

In this project we applied various deep learning methods (convolutional neural networks) to identify the key seven human emotions: anger, disgust, fear, happiness, sadness, surprise and neutrality.

Keywords- IMAGE PROCESSING, Face Registration, Facial Feature Extraction

I. INTRODUCTION

Python is platform used to configure the data and it has various inbuilt libraries to perform the task which needs a single call using the object. CNN library provides the network mapping of data which feed forward the data. recognition algorithm is used to classify the given images and train and test the data as well.

The first step is to acquire the system using camera. In the second step face is detected from the acquire images. As a third step face recognition detected face is recognize and features are extracted from the libraries.

II. LITERATURE REVIEW

A. Preprocessing : Preprocessing is a common name for operations with images at the lowest level of abstraction both input and output are intensity images. Most preprocessing steps that are implemented are –

- a. Reduce the noise
- b. Convert The Image To Binary/Grayscale.
- c. Pixel Brightness Transformation.
- d. Geometric Transformation.

- B. Face Registration : Face Registration is a computer technology being used in a variety of applications that identifies human faces in digital images. In this face registration step, faces are first located in the image using some set of landmark points called “face localization” or “face detection”. These detected faces are then geometrically normalized to match some template image in a process called “face registration”.
- C. Facial Feature Extraction : Facial Features extraction is an important step in face recognition and is defined as the process of locating specific regions, points, landmarks, or curves/contours in a given 2-D image or a 3D range image. In this feature extraction step, a numerical feature vector is generated from the resulting registered image. Common features that can be extracted are- a. Lips b. Eyes c. Eyebrows d. Nose tip

III. STUDY FINDINGS

- A. The current system of this able to detect a single face at a time it can not detect multiple face. Even if we have similar kind of the data or person it conflict between two person. The system may fail if we have train data of person with beard and if that person comes without beard that system may fail. If we want to train data in the live system that needs lots of efforts and time.
- B. help out many features collaborative with in one type of the system included. So it can be helped out in new trends that many functions usable to in one web application in these new system. Different kind of a modules and phases are usable in that known as a particular of the fields.
- C. System should be able to one time login. It provide user-admin communication. It provide highest access of data. It provide secure accessibility.it also provide flexibility of services. It also provide reliable images and give better performance.
- D. Every user should be comfortable for the working of the known as a basic computer and net browser. They must have basic knowledge of English Language. User have

to login one time. User can select the desired person by selecting categories. User must have some knowledge of how to use any websites. They have been some create account of basic needs.

- E. Admin is an entity that will manage entire system. Admin have must authorized. Admin have all rights to performing any type of given rights to the given user because they will have highest level of access the rights. Admin have under observation of some areas like database, security, integration and management.
- F. The minimum hardware requirement is Memory of 4 GB RAM or more, Monitor resolution of 1024*768 or highest access, Intel Pentium 4 or AMD Athlon 2 GHz (or more faster), 1 GB (or more) available hard disk space.

IV. FUTURE ENHANCEMENT

We would also like to train more databases into the system to make the model more and more accurate but again resources becomes a hindrance in the path and we also need to improve in several areas in future to resolve the errors and improve the accuracy.

Having examined techniques to cope with expression variation, in future it may be investigated in more depth about the face classification problem and optimal fusion of color and depth information. Further study can be laid down in the direction of allele of gene matching to the geometric factors of the facial expressions. The genetic property evolution framework for facial expressional system can be studied to suit the requirement of different security models such as criminal detection, governmental confidential security breaches etc.

V. CONCLUSION

In this case, when the model predicts incorrectly, the correct label is often the second most likely emotion. The facial expression recognition system presented in this research work contributes a resilient face recognition model based on the mapping of behavioral characteristics with the physiological biometric characteristics. The physiological characteristics of the human face with relevance to various expressions such as happiness, sadness, fear, anger, surprise and disgust are associated with geometrical structures which restored as base matching template for the recognition system. The behavioral aspect of this system relates the attitude behind different expressions as property base. The property bases are alienated as exposed and hidden category in genetic algorithmic genes. The gene training set evaluates the expressional uniqueness of individual faces and provide a

resilient expressional recognition model in the field of biometric security. The design of a novel asymmetric cryptosystem based on biometrics having features like hierarchical group security eliminates the use of passwords and smart cards as opposed to earlier cryptosystems. It requires a special hardware support like all other biometrics system. This research work promises a new direction of research in the field of asymmetric biometric cryptosystems which is highly desirable in order to get rid of passwords and smart cards completely. Experimental analysis and study show that the hierarchical security structures are effective in geometric shape identification for physiological traits.

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REFERENCES

- [1] Convolutional Neural Networks (CNN) With TensorFlow by Sourav from Edureka[https://www.youtube.com/watch?v=umGJ30-15_A]
- [2] Recognizing Facial Expressions Using Deep Learning by Alexandru Savoiu Stanford University and James Wong Stanford University [http://cs231n.stanford.edu/reports/2017/pdfs/224.pdf]
- [3] Deep Learning Simplified by Sourav from Edureka [https://www.youtube.com/watch?v=dafuAz_CV7Q&list=PL9ooVrP1hQOEX8BKDplfG86ky8s7Oxbzg]
- [4] Predicting facial expressions with machine learning algorithms by Alex Young , Andreas Eliasson , Ara Hayrabedian , Lukas Weiss , Utku Ozbulak[<https://github.com/utkuozbulak/facial-expression-recognition>]
- [5] “Robust Real-Time Face Detection”, International Journal of Computer Vision 57(2), 137–154, 2004 □ “Facial expressions of emotions: an old controversy and new finding discussion”, by P. Ekman, E. T. Rolls, D. I. Perrett, H. D. Ellis, Pill Trans. Royal Soc. London Ser. B, Biol. Sci., 1992, vol. 335, no. 1273, pp. 63-69.
- [6] Going Deeper in Facial Expression Recognition using Deep Neural Networks, by Ali Mollahosseini1, David Chan2, and Mohammad H. Mahoor1 Department of Electrical and Computer Engineering, Department of Computer Science, University of Denver, Denver, CO.