Review: Face Recognition System

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Abstract— *This review and work focuses the technical advancements in the field of "Face recognition system". The system requires identification of faces in still image or video. There are many ways of doing this is hybrid, local or global method. The bottle necks are intensity, pose, and expression illumination in the image.*

Keywords— Face recognition, Facial feature, image segmentation.

I. INTRODUCTION

Face recognition is an important biometric application. There are many methods of detecting the face like fisher face, Eigen face, LBP faces, etc. This field requires high accuracy.

The face detection technology has made advances and finds wide application in the field of commercial identification for example: banks, security system, image film processing, psychological application, computer interaction, smart card, forensic science and surveillance.

II. LITERATURE SURVEY

The authors have detected facial features like eyebrows, mouth, eyes. Then, active conform is applied to segment these features next step is to extract points of interest. In order to component the relative distance [4][3].

The performance is evaluated by studying Japanese female facial expression data set. The performance of the proposed approach was evaluated using confusion matrix in order to complete some evaluation: global error rates. Specific rules are and posteriori error seven type of expressions.

The author has introduced a new feature-based approach for facial expression recognition. This method ensures full automatic solution to human identification irrespective of different facial expressions. The author accepts that the work can be improved by integrating other more precise active color technique to external accurately facial feature shape.

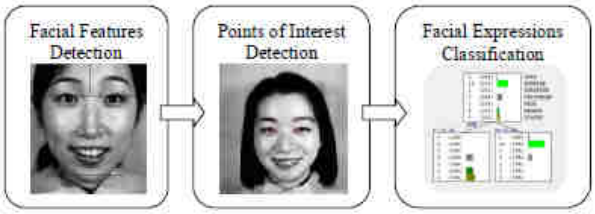
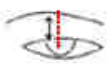
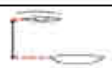


Fig. 1: The proposed approach for facial expression recognition.

TABLE I. FEATURE DISTANCE DEFINITIONS

D_0		Distance between the center of the eye and the horizontal axis of the detected eyebrows.
D_1		Distance between upper and lower eyelid.
D_2		Distance between the inner corner of the eye and the inner corner of the eyebrow.
D_3		Mouth width.
D_4		Mouth opening height.
D_5		Distance between the corner of the mouth and the corresponding outer corner of the eye.
D_6		Distance between the corner of the mouth and the corresponding eye center.

In [2] Automated attendance system has worked out a model following system architecture.

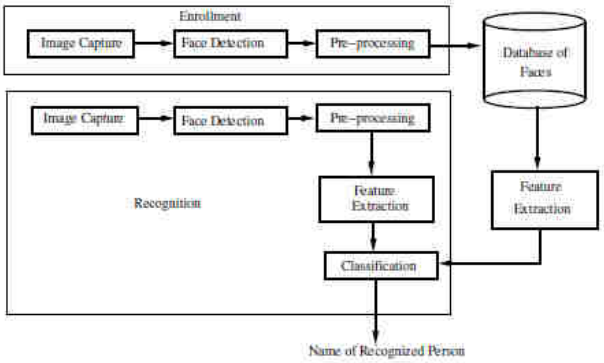


Fig. 2: System Architecture

The work can be summarized as under:

The camera is mounted at the entrance to take snapshots of the students. A viola-Jones detection algorithm is efficient for real time application. This is effective in different lighting conditions. The haar classifiers are employed for better detection up to 90 degree angle.

The detected face undergoes histogram equalization. This improves contrast of the images.The detection of enrolled students has to be performed in this work a data base of 80 students was stored.

In Principal Component Analysis (PCA) algorithm, the face images are represented using Eigen faces. This work of Automated Attendance System based on face recognition techniques one proved to be time saving. In real time LBDH proves to the best algorithm.

In [7] "Robust face detection work" author focuses on facial feature tracking. It is based on Haar-like features. This is fast and robust under any illumination condition. For feature point "Shi and Tomasi" method, Feature Tracker algorithm is used. Pyramidal Lucas Kanade algorithm [6] is the powerful optical flow algorithm used in tracking.

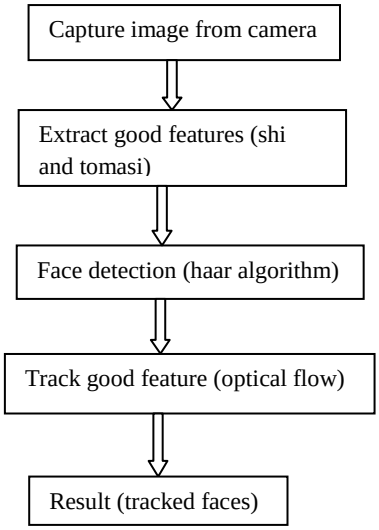


Fig. 3: The algorithm used to track the face.

For face detection author has used Viola- Jones face detected based on the Haar like feature.

The purpose of using feature rather than the pixels is that features can act to encode adhoc domain knowledge. This system works faster as compared to pixel based system.

Internal image: Rectangular features can be computed with speed for integral image. Using the integral image any rectangular sum can be computed in four array references.

Cascade of Classification: The overall form of the detection process that of generated decision tree. This is cascade.

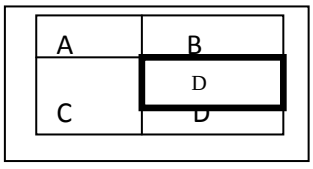


Fig. 4: Sum of pixel values within "D".

A series categorized are applied to every method.

Facial Feature Extraction: Shi & Tomasi method [5]. This is based on the general theory that the luminance intensity does not change for image acquisition.

Motion Detection & Tracking: Motion detection and its behavior are important. Block matching analysis and optical flow estimation methods are used for this purpose.

Optical Flow: It is the visual motion of standing objects as we move around. The world moves in opposite direction. There is also a relationship between the magnitude of their motion and the angle between the direction of our movement and their relative position.

Optical Flow Tracking: Optical flow is the apparent motion of image brightness. This does not correspond to the motion field. This is the aperture problem.

Optical Flow Methods: In order to estimate the optical the optical flow problem a constrained is superimposed to estimate the same. The popular methods are

1. Block based method.
2. Discrete optimization method and
3. Differential method.

Lucas Kanade method is the differential method. The Lucas Kanade algorithm [1] can be applied in a sparse text because it relies only on local information that is derived from same window surrounding each of the points of interest.

Pyramidal Lucas Kanade Feature Tracker: It is the powerful optical flow algorithm used feature tracking is to find the location.

III. CONCLUSION

In research work the face tracking algorithm is tested. To detect the face in the image face detection based on the Haar-like feature. This detection is efficient and robust to any illumination levels. To track facial feature points, Pyramidal Lucas Kanade feature tracker, KLT algorithms is used.

ACKNOWLEDGEMENTS

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REFERENCES

[1] B.D Lucas & T. Kanade, An Iterative Image Registration Technique with an Application to stereo visioin," Processing of the DARPA imaging understanding workshope, pp, 121-130, 1981.

[2] Chintalapati S & Raghunadh M.V, "Automated Attendance Management System Based On Face Recognition Algorithms",IEEE, 2013.

[3] Mliki H , Fourati N, Smaoui S & Hammami M, "Automated Facial Expression Recognition System", IEEE, 2013

[4] Meethongjan K & Mohamad D, "A Summary of Literature Review: Face Recognition", Annual Research 2007.
[5] J. Shi & C. Tomasi, "Good Feature to Tracker," IEEE Conference on Computer Vision and Pattern Recognition, pp. 593-600, 1994.
[6] J.Y. Bouguet, "Pyramidal Implementation of the Lucas Kanade Feature Tracker Description of the algorithm," Intel corporation, Microprocessor Research Labs, pp. 1-9, 2000.
[7] Sethi N & Aggarwal A, "Robust Face Detection and Tracking Using Pyramidal Lucas Kanade Tracker Algorithm",IJCTA, 2011.