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A Survey on Face Detection Methods

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ABSTRACT

Face detection is a process of extracting different features in the images. Face recognition is implemented in different applications in real-time environment like Biometric Systems, Gender Identification, CrimeDepartment, Human Computer Interaction Systems, Digital Cosmetics Surveillance Systems, Video Tracking and Others. They are different algorithms are used in Face Detection. The different variations appearance in the images leads to problems in computer vision. The main goal of the paper to propose different methodology in Face detection.Face detection is the first steps in face recognition .Face detection is to identify whether any faces present in the given image and to retrieve location, details of each image

Keywords: Face detection, Principal Component Analysis (PCA), LBP, SIFT, SIF.

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INTRODUCTION

In recent years the advances of computing technology, sensing devices has increased to development in real time applications which interact with humans. One of the main technique used to implement Human – computer interaction is face recognition. Face detection is the used to identify the different measures in facial analysing like Gender identification, Age recognition, Face recognition, Face authentication, Expression Tracking, Image quality and etc. Face recognition used to development the security system to the Terrorism.

Now a days Face detection method dealing with single images and also tracking the images. In Vedio stream. Face detection process in Different variation sinpose, Facial expression, Location, Angle, Light Conditions, Illumination, camerapixels, Orientation problem, etc. Face detection contains mainly three components, Ada Boost, Internal image, Cascade structure. Inter al image is the first algorithm which is implemented in Computer graphics used to effectively calculate the sum in rectangle grid subset and also used in implementation in Haar like features. Ada boosting is the first processing all boosting algorithm to find the high accurate hypothesis, Attentional cascade structure used to degenerate the decision tree known as cascade. Face detection including variant representations like Haar wavelets, scale based, parts based, Haar-like features etc. the recent method Haar-like features hasefficienttodetect faces under occlusion. Ada boost has Effectively detect the real time application under partial occlusion.



Fig:Face Detection

DIFFERENT METHODOLOGY

They are different algorithms are used for face detection in Face recognising process. They are Template mataching, Haar-like features, Appereancebased, Feature invariant based, Pca based etc.

Pca Based Face Recognising System:

Hyeonjoon, jonathanphillips(2001) proposed paper based on Pca based face recognising used in numerous research in computer vision and psychophysics and it is a basic for all face recognising algorithms. pca method is used to analyse and handling data for reducing the dimensionality of data set.



Fig2.1: PCA Recognition Image

Process will reduce the storage space and transmission time in network systems. The second step to trace the image by scaling, rotating the centre of eye. In third step to recognise hair, clothes, accessories. In pca algorithm it first normalize the original image to convert in to standard format. In pca algorithm it first normalize the original image to convert in to standard format. In next process it feature extraction used to convert in to eigenvectors and eigen faces. Every Eigen face is calculated with weighted sum which is stored in 1-d Array

Feature-Based Matching

Uma Shankar Kurmi, R. K. Baghel, Dheeraj Agrawal (2014) proposed paper based on Feature based matching method used to effectively detect. The organs in the image like ear, nose, eyes, checks, etc

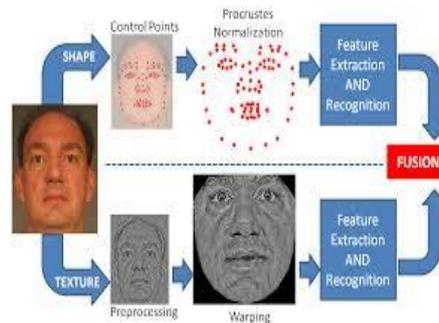


Fig2.2: Feature-Based Matching

In this recognising face is based on labelled graph. Graph which contains nodes and vertices. In this algorithm every image is represented in the form of label graph where nodes consists set of 40 Gabor wavelets which are complex used to encode the Gray values and edges are used to encode objects. In final process by combining of face graph will form Face bunch graph.

Local Binary Pattern (LBP)

Ms.Varsha Gupta, Mr. Dipesh Sharma(2014) proposed paper on Local Binary Pattern to describe effectively Texture Images. This algorithm mostly effectively applied in video streaming application where to detecting moving objects. Every pixel image is assigned to Texture value. Square matrix is used to store Texture values. When compared to remaining algorithm it is simple approach to implement and less computationally and high performance than Haar-like feature.

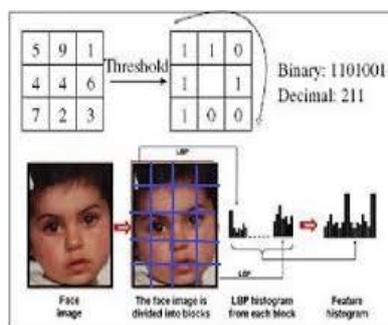


Fig2.3: Local Binary Pattern Image

Scale Invariant Feature Transformation (SIFT)

Aruni Singh, Sanjay Kumar Singh, Shrikant Tiwari(2012) proposed paper on SIFT used to extract the features between variant images for matching different pose of the same image. To extract above process some steps to be performed.

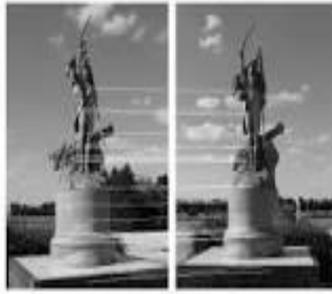


Fig2.4: SIFT Image

Step-1:ScaleSpaceExtrema Detection:

In this process to select the highest and lowest of Difference of Gaussian (DOG) for every image and is represented by scale factor.

Step-2:Removing Unlike Points

In this step at each candidate point removing the low contrast by calculating the DOG to increase the performance.

Step-3: Keypoint Evaluation

In final process calculating local feature value with every key point which is based on the local image gradient depends on invariant orientation

SIF:

Nikolay Degtyarev and Oleg Seredin proposed this algorithm which is mainly used in Data analysis and Testing. The main process in this is red spots obtained in eye in face image.



Fig2.5: SIF Image

This first process to detect minimum brightness of the image and discarded the images which having minimum threshold value and remaining images are stored. Then the single points are normalised, transformed and stored in lattice with fixed size and then transfer to SVM classifier.

CONCLUSION

Face detection is the first process in Face recognition which play a key role in so many fields such as Digital environment, Bio metrics, Gender Identification, crime etc. Still Face detection facing challenges in Illumination, Orientation problem, pose, Illumination Location, Angle, Light Conditions, camera pixels. The above described algorithms not sufficient to solve these challenges. Feature work can be done to get the better results in Location angle, pose, occlusion, Orientation problems.

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