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Face Detection in Image and Video using Neural Network

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Abstract: *face detection is an important part in bio-metrics. It is a computer technology which helps to detect and identify human faces in digital images. In this paper face is detected from the given photo and the video using neural networks. Then the detected face can be given for face recognition. Neural networks are trained using face and non face images stored in database. Gabor filters are used for feature extraction from local images. Feed forward neural network is created using back propagation method. From a given input image or video, the face is detected using neural network to enhance the accuracy and performance. The face is detected with the help of trained neural networks.*

Keywords: *Artificial neural network (ANN), Gabor filters, Back propagation.*

I. INTRODUCTION

Digital photos and video are becoming more and more momentous in the multimedia information. The face plays an important part in an image or video. Detecting the position of human faces and subsequently extracting the facial features in an image is a significant facility with a wide range of applications, such as human face recognition, person-computer interfacing, video-conferencing, etc. The face detection techniques are used to perceive the useful information that are relevant to the face expression and analyses it. In the past years, many approaches have been proposed for improving the performance of face detection. In computer vision according to the various complication process in the face detection technique is the first part of facial expression recognition that will be performed before recognition system. Benefits of face detection systems in comparison to other detection systems are its appropriate detection power, reliability, social acceptability, safety and privacy. Face detection is the first and most important step in any automatic face recognition system. Its reliability to a great extent affects the performance and usability of the entire system. Face detection in an image and video using neural network helps to solve these problems. Given a particular image or a video frame, an ideal face detector must have the capability to find all the present faces contained by that image, regardless of their position, facial gestures, variations in scale and direction. Face-detection algorithms principally focus on exposure of human faces. It is equivalent to image detection in which the image of a person is harmonized bit by bit.

II. RELATED WORK

There are several methods that detects face in images. In Principal component analysis (PCA) method[1] it uses with linear protrusion to recognized faces in a real-time video stream. It not only reduce the dimensionality of the image, but in addition some of the variations in image. After performing the PCA, the hidden layer neurons of the radial basis function neural networks have been modeled by considering intra-class discriminating characteristics of the training images, this help the RBF neural networks to acquire wide variation in the lower input space and improve its generalization capabilities. Next method is Self Organization Map (SOM), the self organizing map[12] is identified as a KohenMap in artificial neural network. For the duration of facial expression recognition the SOM techniques are used to measure image similarity. A Self-Organizing map consists of ready for accomplishment layer which can organize a data set of vectors with any number of dimensions into the many classes. Viola and Jones designed a fast, robust face detection system where AdaBoost learning is used to build nonlinear classifiers. Linear regression [9] classification algorithms are used to identify the facial expression in pattern recognition. Linear regression using a concept of single object class lie on linear subspace. Linear model take the images as linear combination of class specific galleries, which used a standard database for handle the images

III. PROPOSED SYSTEM

Face detection in an image and video is detected using neural networks. It is a computer technology which helps to detect and identify human faces in a digital images as well as in video. face is detected from the given photo and the video using neural networks. Then the detected face can be given for face recognition. Neural networks is trained using face and non face images

stored in database. Gabor filters are used for feature extraction from local images. First and foremost the features are extracted using gabor filters and then given to the trained neural network. This neural network is helped to detect the face.

The operation of the face detection system can be broken down into three main areas:

Initialisation (design and creation of a neural net work)

Training (choice of training data, parameters, and training)

Classification (scanning images to locate faces)

A database is used which contains sample images of faces and non-faces which is used to train the network.

The face/not-face classier consists in a multilayer- perceptron neural network with 2 hidden layers.

The training/validation sets consist in a database faces and non faces of different people.

Every revealing system needs a classifier that looks at your vector and decides if it is compact or not. In case of face detection, the classifier checks for faces. Face Detection System in MATLAB uses Neural Network as its classifier. Then an image and video is scanned at all probable locations by a patch. Each patch is feed to the feature extraction function and the output vector goes to the classifier.

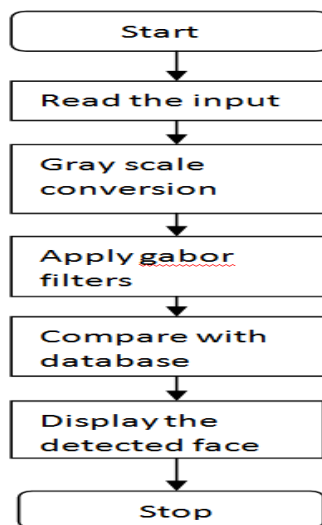


Fig: flow chart of proposed system

he major steps in face detection system is given below:

Step 1: The input is read, it may be an image or video

Step 2: Apply gray scale conversion

Step 3: Features are selected using Gabor filters

Step 4: compare the features

Step 5: Display the portion of the detected face

Given a particular image or a video frame, an ideal face detector must have the ability to locate all the present faces contained by that image, regardless of their position, facial gestures, variations in scale and direction. This proposed system detects the face from the given image or video stream using gabor filter for feature extraction and neural network as classifier. This method provides very quick and effective result.

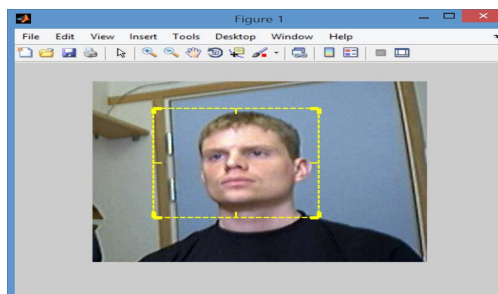


Fig: detected face from the input image

IV. CONCLUSION

Face detection using neural networks from an image and video can be detected using this system. The face detection techniques are used to detect the face in an image or video which are helpful to the many applications such as expression analysis. Over the past decade, several approaches have been proposed for improving the performance of face detection. This method has the acceptance ratio is more than 90 % and execution time of only few seconds and gives accurate results.

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