Estimation of facial Expression and Head Pose: Survey

Prof.Mr.C.D.Badgujar, Miss. Karuna Wani

1. Asstt. Professor in Dept Of Computer Sciences And Engineering G.H.Rasoni Institute of Engineering And Management Jalgaon
2. Student of G.H.Rasoni Institute of Engineering And Management Jalgaon

Abstract: Now days, involuntary identification of people is a challenging problem which has received much attention during the recent days it has many applications in different fields. Face recognition is a very challenging problem and up to date, there is no technique that provides a robust solution to all situations and different applications that face recognition. Our main objectives in work introduce the system for expression detection and pose detection both. Our proposed work captains basic steps face detection, preprocessing, feature extraction. For detection of the expression from face we use the JAFEE dataset along with combination of the emotion detection using 2DPCA method due to drawback of PCA method or to overcome on PCA we use 2DPCA for both pose as well as expression recognition system done in images captured by cameras. However accurate and robust pose estimation is often problematic. The foundation studies of face expression was started in 17th century. A detailed study on the various expressions and movement of head muscles was given in 1649 by John Bulwer in his book “Pathomyotomia” On to the 19th century, one of the important works related to the facial expression recognition was done by Charles Darwin. In 1872, Darwin wrote the general principles of expression and the means of expressions in both humans and animals.

Keywords: 2DPCA, PCA, head pose, face expression.

1. INTRODUCTION

With the increasing interest of computers in day to day life, the gap between computers and human being is less. But one thing in human being that separate the human and computer from each other is emotion of human. Now scientists try to extract emotion from face so that they bridge the gap. Scientists study signal for their understanding of the relation between facial expressions and the associated mental states. They propose a method called as the Facial Expression Recognition (FER) method that semi-automatically extracts and classifies facial expressions from face images to support behavioral scientists in their study of social signals. Facial expression identification has been more vital area in image processing research field. Expression has central point of human being. So it not only challenges for researcher but also for the physician. Facial expression is a way of non-verbal communication. A person shows their feeling by using facial expression. There are so many researches on this issue and most of the researchers have investigated various algorithms to handle expression variation.

Usually, face is made from bones, facial muscles and skin tissues. Human Expression basically classified into six basic expressions sad, happy, fear and so on. But apart from the six basic emotions, the human Head pose estimation plays an essential role for bridging the information gap between humans and computers. Conventional head pose estimation methods are mostly

2. LITERATURE SURVEY

Face expression is one of the most significant applications of image processing. It is great challenge to build automatic system which equal as human ability to recognize face. Arguably the first script on face expression recognition was published in 1974. In 1978, there were the first to attempt automatic face recognition using image sequence. After that developed research was done by the efforts of Mase and Pentland. The first survey paper on expression recognition was published in 1992 by Samal and Iyengar (2, 3, 1). Expression recognition start from the recognition of face. FER is considered as special case for pattern recognition problem and that many techniques are available. There are many build algorithms available for this system. So a major part of this work is to determine the optimal combination of algorithms. To do this, we first divide the system into 3 modules, i.e. Pre-processing, Feature Extraction and Classification. Many attempts have been made to improve the reliability of these recognition systems. One highly successful approach is eigen faces, which is proposed by the Matthew Turk and Alex Pentland in 1991 based on principal component analysis (PCA). PCA is a useful statistical technique that has found application in fields such as face recognition and image compression, and is a common technique for finding patterns in data of high dimension. To solve drawback of PCA’s computational problems, Jian Yang and his colleagues proposed 2DPCA (2DPCA), which also generally surpasses PCA for recognition problems (4).

A straightforward image projection technique, called two-dimensional principal component analysis (2DPCA), is developed for image feature extraction. As opposed to
conventional PCA, 2DPCA is based on 2D matrices rather than 1D vectors. That is, the image matrix does not need to be previously transformed into a vector. However, 2DPCA’s drawback is that it requires more coefficients for image representation than PCA. (1) Other researchers proposed (2D) 2PCA to reduce coefficients by simultaneously considering the original image’s row and column directions. 2DPCA has proven to be a good feature extractor for face recognition, it still generates numerous coefficients.

3. METHODOLOGY
Face expression recognition system recognize an individual by the input image to find the best match of all user in database. In last few year face recognition system by various method gain the momentous consideration. The input of the system is fixed i.e. either image or vide stream. There some basic step which is always followed by researcher to implement the system. 1. Image Reprocessing, 2. Feature Extraction 3. Classification.

Almost all modules are based on statistical methods and they will be trained using a labelled training set.

Face detection is defined as the process of extracting faces from scenes.

The first step in the system is face detection. It contains much variation. Some approach defines a face recognition system as a three step process. From this point of view, the Face Detection and Feature Extraction phases could run simultaneously (7).

3.2 Feature Extraction
Feature extraction involves several steps - dimensionality reduction, feature extraction and feature selection.

3.3 Feature selection methods
Feature extraction algorithm’s aim is to select a subset of the extracted features that cause the smallest classification error. (5)

4. CONCLUSION AND FUTURE SCOPE
Face recognition systems have improved a lot over the past decade. Today also it is impossible to have a robust system for face recognition which is able to analyze faces across pose, expression, illumination as well as lighting variations etc. The main objective of the system is to introduce the system for analysis faces across poses as well as expressions using 2DPCA. This techniques gives high rate of accuracy as compared to PCA and other methods with minimum time. The next decade will be interesting since I think that there is possible to find out the combination of human expression like happy with surprise. It also lead to build the robot system which help to identify the human expression as robot can take decision in day to day work with human. This is going to have an impact on our day to day life by enhancing the way we interact with computers or in general, our surrounding living and work spaces.

REFERENCES


[13] Anil K. Jain, Brendan Klare, and Unsang Park, “Face Matching and Retrieval in Forensics Applications”, 1070-986X/12/ 2012 IEEE Published by the IEEE Computer Society
