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A REVIEW ON THE USE OF FACIAL EXPRESSION FOR EMOTION RECOGNITION

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ABSTRACT
Facial expressions are the fastest means of communication while conveying any type of information. These are not only exposes the sensitivity or feelings of any person but can also be used to judge his/her mental views. This paper includes the introduction of the face recognition and facial expression recognition and an investigation on the recent previous researches for extracting the effective and efficient method for facial expression recognition.

KEYWORDS: *Emotion recognition, Facial expression, Image processing*

I. INTRODUCTION

Facial Expression plays an important role in human-to-human interaction, allowing people to express themselves beyond the verbal world and understand each other from various modes the facial part does the major contribution in human communication.
From the review of papers on facial expression, it is clear that most of the facial expression recognition systems (FERS) were based on the Facial Action Coding System (FACS). Facial expression recognition is a method to recognize expressions on one's face. A wide range of techniques have been proposed to detect expressions like happy, sad, fear, disgust, angry, neutral, surprise but others are difficult to be implemented. Facial expression recognition is composed of three major steps: (1) Face detection and pre-processing of image, (2) Feature extraction and (3) Expression classification.

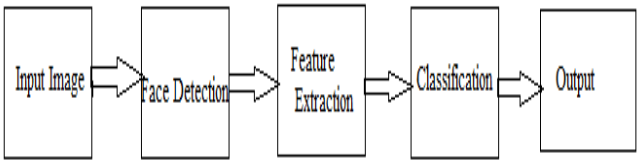

Fig.1. Emotion recognition mechanism[6]

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II. LITERATURE SURVEY

Krupali Joshi, Pradeep Narwade [1], In Their paper they had presented emotion recognition model using the system identification principle. A comprehensive data driven model using an extended self-organizing map (SOM) had been developed whose input is a 26 dimensional facial geometric feature vector comprising eye, lip and eyebrow feature points. Their paper thus includes an automated generation scheme of this geometric facial feature vector. MMI facial expression database is used to

develop non-heuristic model. The emotion recognition accuracy of the proposed scheme has been compared with radial basis function network, and support vector machine based recognition schemes. The experimental result shows that the proposed model was very efficient in recognizing six basic emotions. It also shows that the average recognition rate of the proposed method is better than multi-class support vector machine.

Mohammad Shahidul Islam, Surapong Auwatanamongkol [2], this paper presents a new technique to extract the light invariant local feature for facial expression recognition. It is not only robust to monotonic gray-scale changes caused by light variations but also very simple to perform which makes it possible for analyzing images in challenging real-time settings. The local feature for a pixel is computed by finding the direction of the neighboring of the pixel with the particular rank in term of its gray scale value among all the neighboring pixels. When eight neighboring pixels are considered, the direction of the neighboring pixel with the second minima of the gray scale intensity can yield the best performance for the facial expression recognition in our experiment. The facial expression classification in the experiment was performed using a support vector machine on CK+ dataset The average recognition rate achieved is 90.1 ± 3.8%, which is better than other previous local feature based methods for facial expression analysis. The experimental results do show that the proposed feature extraction technique is fast, accurate and efficient for facial expression recognition.
Neha Gupta and Prof. Navneet Kaur [3], in this paper, they had proposed an accurate and high speed emotion detection system. The color and feature-based detections were adopted to find skin-color fast and selected candidate blocks carefully. They used lighting compensation to improve the performance of color-based scheme, and reduce the computation of feature-based scheme. The major contribution of their paper wass that their proposed method can detect edges of the images and from that edges distance between various features is calculated by using Euclidean distance Formulae. This distance is different for every image posing different emotions. On the basis of this distance emotions are classified. In future work, the proposed approach can be applied to hardware implementation. Due to the proposed method has simple structure, it is suitable to be implemented in hardware to achieve very high performance and low power system.
Vidya Manian and Arun Ross [4], A combination of statistical and multi-resolution texture features has been used to design an automatic face detection algorithm. The algorithm is observed to perform well under different lighting and background conditions. By appropriate tuning of the thresholds, the number of false positives can be effectively reduced. The algorithm is computationally less expensive compared to other methods in the literature and is feasible for implementation in real time face detection systems.

M. Kalaiselvi Geetha, A. Punitha [5], their work concentrated on classifying facial expressions into four emotions: Happy, Disgust, Neutral and Surprise using texture features extracted from Gray Level Co-occurance Matrix. The results are proving that GLCM features based SVM is giving higher classification rate of 90 %. The system can be extended to extract higher-order statistical texture feature from images and taking into account some of the strange facial expressions.

Urvashi Agrawal, Shubhangi Giripunje, Preeti Bajaj [6], In Their work the FBS system for different Facial Gestures and Emotions was discussed. Fuzzy systems are good at explaining their decisions since it depends totally on the rules defined. Their Experiment was carried out on 500 different image. Each image frame has size 640 x 480. The system gives 91.66% Accuracy for Facial Gesture Tracking and 90% Accuracy for Emotions recognition while using Simultaneous Facial Gesture Tracking and Emotion recognition it provided 94.58% accuracy. Their research work presented a comprehensive and simultaneous detection of Gesture implementation and Emotion. The Fuzzy logic systems, good at explaining their decisions since they can process imprecise information and they cannot automatically acquire the rules they use to make those decisions. The proposed system is found a novel approach to assist the driver and safeguard the vehicle by switching into auto mode driving need. It shows the increasing percentage of Accuracy when Both Facial Gesture and Emotion recognition is done simultaneously.
Ira Cohen, Ashutosh Garg, Thomas S. Huang [7], In their work a new method for emotion recognition from video sequences of facial expression was explored. Emotion-specific HMM, relied on segmentation of a continuous video into sequences of emotions (or neutral state). However, multilevel

HMM, performed automatic segmentation and recognition from a continuous signal. The experiments on a database of five people showed that the recognition rates for a person-dependent test are very high using both methods. The recognition rates drop dramatically for a person-independent test. This implied that a larger database is needed for the training, and possibly the subjects should be classified according to some categories, such as ethnic background and gender. This implies the use of a different set of classes to get more robust classification. The classes can be positive, negative, surprise and neutral. This scale clusters the emotions into four categories, and can improve the recognition rate dramatically. This work relied on a database collected by Chen, but it is difficult to compare the results to other works using different databases with computers. Recognizing the emotion from just the facial expressions is probably not accurate enough. The emotional state of a person. Their work is just another step on the way toward achieving the goal of building more effective computers that can serve us better.

Carlos Busso, Zhigang Deng , Serdar Yildirim, Murtaza Bulut, Chul Min Lee, Abe Kazemzadeh, Sungbok Lee, Ulrich Neumann , Shrikanth Narayanan [8], This research analyzed the strengths and weaknesses of facial expression classifiers and acoustic emotion classifiers. In these unimodal systems, some pairs of emotions are usually misclassified. However, the results presented in this paper show that most of these confusions could be resolved by the use of another modality. Therefore, the performance of the bimodal emotion classifier was higher than each of the unimodal systems. Two fusion approaches were compared: feature-level and decision-level fusion. The overall performance of both approaches was similar. However, the recognition rate for specific emotions presented significant discrepancies. In the feature-level bimodal classifier, anger and neutral state were accurately recognized compared to the facial expression classifier, which was the best unimodal system. In the decision-level bimodal classifier, happiness and sadness were classified with high accuracy. Therefore, the best fusion technique will depend on the application. The results presented in this research show that it is feasible to recognize human affective states with high accuracy by the use of audio and visual modalities. Therefore, the next generation of human-computer interfaces might be able to perceive humans feedback, and respond appropriately and opportunely to changes of users affective states, improving the performance and engagement of the current interfaces.

III. CONCLUSION

In this paper, the review on emotion recognition using facial expression has been highlighted. This paper presents literature surveys on the various techniques used in the past for emotion recognition. These ways area unit measured on the idea of recognition rate. We have examined every similar project sincerely and ultimately before starting our project. We wanted to create an advance version of the project that is extremely completely different from all the opposite comes created before. This project has hardware implementation which none of the project made before had. A liquid crystal display is used to indicate the feeling of an individual on screen. Bluetooth device is used in order to send message of persons feelings.

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