

A Survey Paper on Automatic Emotion Detection using Facial Expressions

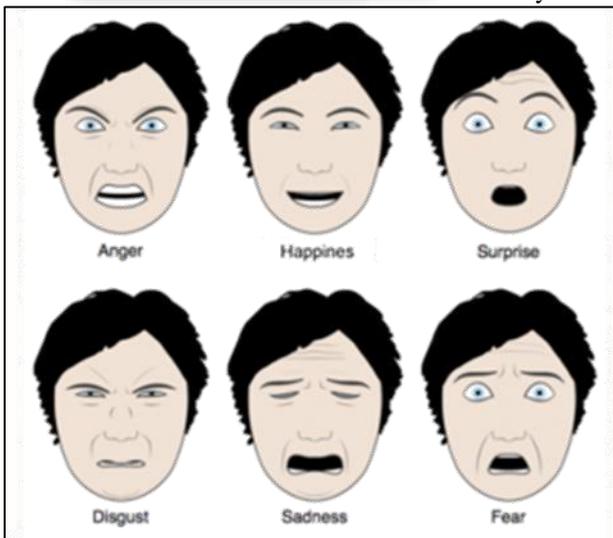
Prof. B. S. Satpute¹ Harshada Dherange² Mahesh Amte³ Yogesh Lamture⁴ Amal Subash⁵
^{1,2,3,4,5}Dr.D.Y.Patil Institute of Technology, Pimpri, Pune-18, India

Abstract— In this Paper we discuss about the emotion detection techniques that is used to identify the person’s mood / emotion using facial expressions. Many methods of emotion recognition such as emotion detection from human face have been discovered. The interaction between human and computers will be more natural if computers are able to receive and respond to human non-verbal communication such as emotions. After the face is detected, image processing based feature point extraction method is used to extract a set of selected feature points. Finally, a set of values obtained after processing those extracted feature points are given as input to the neural network to detect the emotion contained.

Key words: Facial Expression, Emotion Detection, Feature Extraction, Machine Learning

I. INTRODUCTION

An emotion is a mental and psychological state which is subjective and private it involves a lot of behaviour, actions, thoughts and feelings. Emotion Detection is the task of recognizing a person’s emotional state- for example anger, confusion across both voice and non-voice channels. Psychologist Mehrabian’s research shows that only 7% of the total information is passed by language, and 38% is transported by language auxiliary, such as the rhythm of speech, tone, etc. But the ratio of information which passed by facial expression reached 55% of the total. Therefore the lot of valuable information can get by facial expression recognition that gives an effective way to perceive person’s consciousness and mental activity [1].



A. Basic Facial Expression

1) Fear

Eye brows are raised and pulled together, with the inner eye brows being bent upward. The eyes are tense and alert. [5]

2) Disgust

Eye brows and eyelids are relaxed. Also, there is raised and curled upper lip, frequently asymmetrically [5].

3) Happiness

Eye brows are relaxed, with the mouth being open and its corners pulled back toward the ears [5].

4) Surprise

Eye brows are raised. The upper eyelids are wide open, the lower one is relaxed. Also, the jaw is opened [5].

5) Sadness

Inner eye brows are bent upward. Also, the eyes are slightly closed & the mouth is relaxed [5].

6) Anger

Inner eye brows are pulled together downwards, with the eyes wide open. Also, the lips are pressed against each other or opened to expose the teeth [5].

7) Neutral

Relaxed face muscles. Eye lids are tangent to the iris. The mouth is closed and lips are in contact [5].

B. Basic Structure

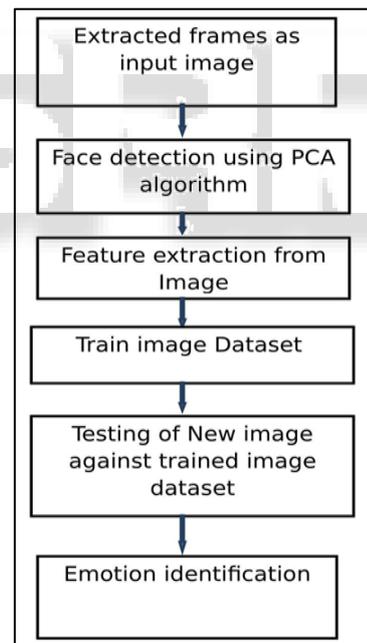


Fig. 2: Model for Face Detection

C. Face Recognition

Face recognition is a technique in which face is recognized by using various recognition algorithms. Face recognition is used for biometric purposes and it also increases the security. In this technique it extracts the features from different images captured by camera.

D. Feature Extraction

Feature extraction is a transformation of input data into a set of features. The process to represent a raw image in a reduced form to facilitate decision making such as pattern detection.

E. Neural Network

A neural network is an interconnected assembly of simple processing elements, units or nodes, whose functionality loosely based on animal neuron. The processing ability of network is stored in the inter unit connection strength, or weight, obtained by a process of adaptation to, or learning from, a set of training patterns.

F. Literature Survey

- Title: Automatic Emotion Detection Model From Facial Expression
Author: Debishree Dagar , Abir Hudait, H. K. Tripathy, M. N. Das
Year: 2016
Classification: KNN.
- Title: Automatic Emotion Recognition Using Facial Expression
Author: Monika Dubey, Prof. Lokesh Singh.
Year: 2016
Classification: HCI.
- Title: Facial Expression Recognition using Wavelet and K-Nearest Neighbor
Author: V. Kumar, A. Sikkander ali baba.
Year: 2014
Classification: KNN.
- Title: Human-Computer Interaction using emotion recognition from Facial Expression.
Author: F. ABDAT, C. MAAOUI and A. PRUSKI.
Year: 2011
Classification: SVM.

II. CONCLUSION

Extensive efforts have been made over the past two decades in academia, industry, and government to discover more robust methods of assessing truthfulness, deception, and credibility during human interactions. Efforts have been made to catch human expressions of anyone. Emotions are due to any activity in brain and it is known through face, as face has maximum sense organs. Hence human facial activity is considered. The objective of this survey paper is to give brief introduction towards techniques and application of automatic emotion recognition system.

REFERENCES

- [1] www.wikipedia.com
- [2] Ting Wu, Siyao Fu, and Guosheng Yang, China “Survey of the Facial Expression Recognition Research” 2012.
- [3] Monika Dubey, Prof. Lokesh Singh, “Automatic Emotion Recognition Using Facial Expression: A Review” [IRJET 2016].
- [4] <https://facedetection.com/>
- [5] Mehang B. Patel, Dipak L. Agrawal, “Facial Expression Recognition System” [JETIR 2016].
- [6] https://en.wikipedia.org/wiki/Feature_extraction.
- [7] https://www.doc.ic.ac.uk/~nd/surprise_96/journal/vol4/cs11/report.html#What is a Neural Network.