

# Novel Approach in Image Processing to Recognize Facial Expressions

Samta Jain Goyal , Arvind Kumar Upadhyaya, Rakesh Singh Jadon

**Abstract:** Human facial expressions recognition has become a main field of interest. Automatic recognition of human’s facial emotions is a thrust area of any Computer Vision (CV) or any Human Computer Interaction (HCI) system. Here, the first detect human face and then recognize human emotions based on feature extraction with high significance. In this work, the improved Fuzzy Reasoning system is designed to classify human emotions based on specified rules.

**Index Terms:** Facial Expression recognition, Template Matching, Human Computer Interaction, TLBO, SVM, Feature Extraction, Feature optimization, Feature Classification

## I. INTRODUCTION

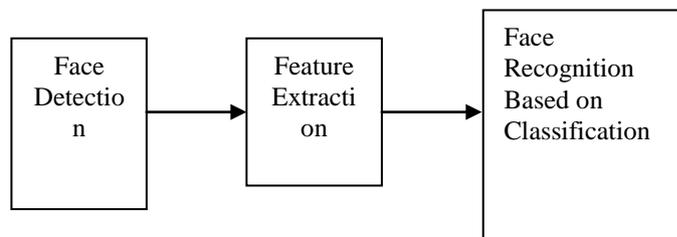
Facial expression recognition has recently viewed as significant attention during the recent years. Basically, this work deals with two steps where first I detect faces and then through its features, recognized expressions. the primary step is to segment the image into number of regions which contains human faces or its parts. Facial Expression Recognition is a well-known of the practically significant applications of image analysis. It’s a true contest to construct an automated course of action which equals human ability to retrospect faces. Although humans are fairly useful for identifying known faces and its expressions[1-3].

## P METHODOLOGY

### II. METHODOLOGY

The proposed work for facial expressions recognition is based on feature selection and feature optimization process. Initially, load dataset for images. Then apply feature extractions approaches to extract features from the image. Based on that features, generate feature matrix based on TLBO. Through SVM, classify features and put them in specific category of classes of emotions. Emotions are generally coming in two categories, first is Basic emotions. These are actually seven including Happy, sad, surprise, anger, disgust, neutral, and fear. Other category is mixer of these basic emotions [4-6].

### A. Generic Facial Expression Recognition System



**Fig 1.1: A generic Facial Expression Recognition system**

Any Facial expressions recognition system is bounded as the function of extracting faces from scenes. The later step is “feature extraction” from the detected face These features perhaps indisputable face regions, variations, angles or measures. Extracted Features are classified through some standard approaches to put them into specified category of emotions.

### B. Facial expressions recognition

Facial expressions recognitions basically to deal mutually with the several free hand known challenges. They are usually reveal in images captured in compulsory environments, a well-known as audit video systems. These challenges can be such as Pose variations, Feature occlusions, Features expressions etc.

### C. Template Matching

The data set collected various group images from Google search engine and other sources. The collected group images used for the facial expressions recognition method based on feature extraction process. Here we also apply the feature extraction method with feature optimization. After that we get the result image and detect the face a particular person in a group and show that our proposed method gives a better result comparison with other Experimental method.

### D. TLBO for Feature Optimization

In this paper, Teaching Learning Based Optimization (TLBO) based any recognition system, feature extraction phase is optimized through this. Experimental results as in the form of table is represented in Table-1 which shows that proposed work performance have better recognition rate then the existing.

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| Group Image name | Method   | Total no of images | Recognition rate through existing approach % |
|------------------|----------|--------------------|----------------------------------------------|
| Group Image      | Existing | 469                | 92.78                                        |
|                  | Proposed | 469                | 95.83                                        |

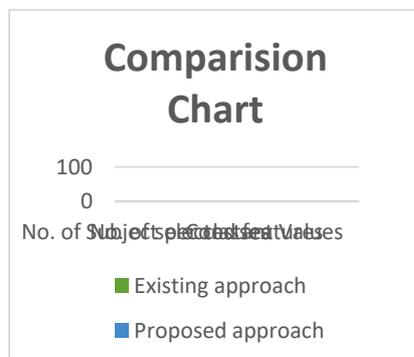
**Table-1:** Shows that the comparative study for group image 1 with using Existing Approach and proposed method.

### E.SVM for image classification

In this paper, main aim is to evaluate the accuracy of a performant classifier Support Vector Machine on facial expression recognition and emotions classification. The general framework to measure the accuracy of a SVM on a given dataset of images is composed with number of stages where in the first stage we preprocess the image through the dataset. Then Separate the dataset for training and testing sets. After this Training Set, Test and evaluation of the performance of SVM [7-11].

### III.RESULT AND DISCUSSION

Comparative result analysis in the form of graph for various group images using for facial expressions recognition on Existing approaches and proposed method. The result shows the recognition rate for number of images in existing approach was 92.78 % whereas in proposed it was quiet better 95.83% as shown in table 1. The following figure showing the graphical representation of compared study of proposed and existing approach-



**Figure-1** The graphical representation of Proposed and Existing approach

### III. CONCLUSION

This paper conclude though the experiment results.Also for futureaspect is to get more accurate and more close to reach 100 % output as a recognition result.

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