REPORT

ON

## DETECTION AND IDENTIFICATION OF HUMAN GESTURES

**NMAM INSTITUTE OF TECHNOLOGY, NITTE**

#### *Submitted to*

**NMAM INSTITUTE OF TECHNOLOGY, NITTE**

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CERTIFICATE

Certified that the project work entitled **……….** is a bonafide work carried out by …studentname1…(USN)……, …studentname2(USN)……, …studentname3(USN)……, …studentname4(USN)…… in partial fulfillment for the award of Degree of Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belagavi during the year 2018-19.It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

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**ABSTRACT**

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Computer vision techniques are used in many fields such as traffic control, event monitoring, marketing, healthcare field, quality control, military technology, etc. One of the sub-areas of computer vision is facial expression recognition. Facial expressions which can be classified fear, happiness, joy, sadness, aggressiveness are recognizable with computer vision techniques. . Emotional expressions at face are related to the movements or positions of the muscles under the skin and are a form of nonverbal agreement.In this study, we developed a system which can perceive four facial expressions are confused, happy, sad and normal. At the first step of the system, human faces are detected and located in an image. In the second step, eyes and mouth are detected in facial areas.

Keywords: Computer Vision, Face Detection, Facial Emotion Recognition,OpenCV

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**CHAPTER 1**

**INTRODUCTION**

Facial emotion recognition is one of the specific issues of computer vision. Emotions which can be classified like fear, happiness, joy, sadness, aggressiveness are recognizable facial expressions using computer vision. Emotional expressions at face are related to the movements or positions of the muscles under the skin and are a form of nonverbal agreement. According to a study; words are important 7 percent, voice tone 38 percent and the effect of body language is 55 percent in a communication.

Analysis of emotions for humans can be used in many areas such as suspect tracking, patient monitoring, human-machine interaction and marketing. The facial emotion detection is a difficult process for machines even facial expressions sometimes can’t be understood by people. One of the reasons of this complexity is two different facial expressions can be seen at a face at the same time and another reason is facial expressions differ from person to person. Face detection, face direction recognition, emotion recognition, face recognition, etc. are important for computer vision based system. For instance, security officers monitor videos from security cameras. Security officers are loose attention 45 percent after 12 minutes and after 22 minutes, this rate would be 95 percent. In this respect, development of the above mentioned fields is very important for automatic computer monitoring. Also, computers can help effectively to the users and robots can behave like humans.

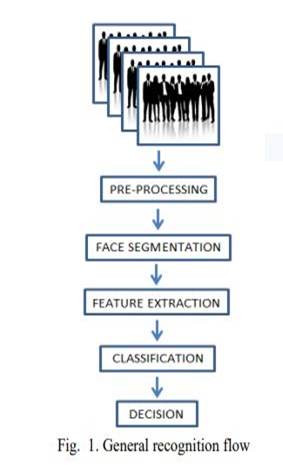
Significant advances have been made in the field over the past decade with increasing interest in non-posed facial behavior in naturalistic contexts and posed data recorded from multiple views and 3D imaging [.In most cases, several limitations are common. These include: 1. Inconsistent or absent reporting of inter-observer reliability and validity of expression metadata. Emotion labels, for instance, have referred to what expressions were requested rather than what was actually performed. Unless the validity of labels can be quantified, it is not possible to calibrate algorithm performance against manual (human) standards 2. Common performance metrics with which to evaluate new algorithms for both AU and emotion detection. Published results for established algorithms would provide an essential benchmark with which to compare performance of new algorithms. 3. Standard protocols for common databases to make possible quantitative meta-analyses. The cumulative effect of these factors has made benchmarking various systems very difficult or impossible. This is highlighted in the use of the Cohn-Kanade (CK) database, which is among the most widely used datasets for developing and evaluating algorithms for facial expression analysis.

**CHAPTER 2**

**LITERATURE SURVEY**

Computer vision applications have been studied for years. Facial emotion recognition is one of the sub branch of computer vision. In this area, there are several applications and approaches. In view of these approaches, a Support Vector Machine (SVM) becomes prominent for classification. Generally, the studies have a flow. According to the flow, first step is face segmentation and then the frames have a preprocessing process.

. The next step is feature extraction and then moves on to the classification process. The general flow is given Fig



Kurt et al., use Artificial Neural Network (ANN) and skin analysis for face detection. Local Binary Pattern (LBP) was used for feature extraction and nearest neighbor approach was used for classification in their study [8]. Smiling, natural and sadness are recognized by their system and their accuracy is 77%.

OpenCV face detector was used in order to detect face location in each frame. Histograms of oriented was used in order to extraction feature vectors and SVM with Radial Basis Function kernels were used for classification process. Their accuracy is 70 percentages. Anger, fear, joy, relief and sadness are recognized by the system.

Dhall et al. used Pyramid of Histogram of Gradients and Local Phase Quantization (LPQ) for feature extraction. Constraint Local Model was used for face detection and for classification, they used SVM and Largest Margin Nearest Neighbours. In the study , Anger, fear, joy, relief and sadness could be recognized by their system with high performance.

Cruz et al. used Boosted Cascade of Haar-like Features in order to detected face location in their study. LPQ was used for feature extraction. SVM and Hidden Markov Model were used for decision step. De et al. recognized 5 emotions which are surprise, sorrow, fear, anger, happiness in their study . Face detection process was actualized with HSV color space and for feature extraction, Principal Component Analysis are used. Euclidean Distance was used to decision. The study’s performance is approximately 85%.

There are different examples in literature for emotion recognition. For instance, some studies include voice recognition with computer vision to detect the emotions. These studies’ name is audio-visual emotion recognition.

Hence we have understood that till the date an appropriate method has not been developed or implemented for the identification of human emotion inn an effective way

**CHAPTER 3**

**PROBLEM DEFINITION**

**CHAPTER 4**

**SYSTEM REQUIREMENTS SPECIFICATION**

**CHAPTER 5**

**SYSTEM DESIGN**

**CHAPTER 6**

**IMPLEMENTATION**

**CHAPTER 7**

**RESULTS AND DISCUSSION**

**CHAPTER 8**

**CONCLUSIONS**

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