Partial Project Report

On

**REAL TIME EMOTION RECOGNITION USING FACIAL EXPRESSIONS**

Submitted to the

Savitribai Phule Pune University, Pune

In partial fulfilment for the award of the Degree of

Bachelor of Engineering in Information Technology

By

407016 Rugved Chaudhary

407007 Mahesh Auti

407026 Deval Sonkusare

407038 Ankul Gupta

Under the guidance of

Prof. R.S. Sonar



Department of Information Technology

Sinhgad College of Engineering

S. No.44/1, Off. Sinhgad Road, Vadgaon (Bk.), Pune-411041, Maharashtra, India

(2017 - 2018)



Sinhgad College of Engineering, Pune-411041

Department of Information Technology

**CERTIFICATE**

This is to certify that

**Rugved Chaudhary (Roll No. 407020)**

**Mahesh Auti (Roll No. 407007)**

**Deval Sonkusare (Roll No. 407026)**

**Ankul Gupta (Roll No. 407038)**

have successfully completed Partial Project Report on

**Real Time Emotion Recognition Using Facial Expressions**

Towards the partial fulfillment of Bachelor’s

Degree In Information Technology of Savitribai Phule Pune University, Pune in the academic year 2017-2018.

**Prof. R. S. Sonar**

Project Guide

|  |  |
| --- | --- |
| Prof. G. R. Pathak | Dr. S. D. Lokhande |
| HOD-IT | Principal |

# Acknowledgement

We are highly indebted to our guide Prof R. S. Sonar for her guidance and constant supervision as well as for providing necessary information regarding the report and also for the support in completing the report. We would like to express our special gratitude and thanks to Prof. B. P. Vasgi and other Staff Members for giving us such attention and time.

This acknowledgement would be incomplete without expressing our special thanks to Prof. G. R. Pathak, Head of the Department (Information Technology) for his support during the work.

We would like to extend our heartfelt gratitude to our Principal, Dr. S. D. Lokhande who provided a lot of valuable support, mostly being behind the veils of college bureaucracy.

We would also like to express our gratitude towards our parents and friends for their kind co-operation and encouragement which help us in completion of this report. Our thanks and appreciations also go to our colleague in developing the report and people who have willingly helped us out with their alignments.

Rugved Chaudhary (Roll No. 407020)

Mahesh Auti (Roll No. 407007)

Deval Sonkusare (Roll No. 407026)

Ankul Gupta (Roll No. 407038)

# Abstract

Increasing and maintaining human productivity of different tasks in stressful environment is a challenge. Music is a vital mood controller and helps in improving the mood and state of the person which in turn will act as a catalyst to increase productivity. Continuous music play requires creating and managing personalized song playlist which is a time consuming task. It would be very helpful if the music player itself selects a song according to the current mood of the user. The mood of the user can be detected by a facial expression of the person. A facial expression detection system should address three major problems: detection of face from an image, facial feature extraction and facial expression classification. The first stage is of face detection from an image for which various techniques used are model based face tracking which includes real-time face detection using edge orientation matching , Robust face detection using Hausdorff distance, weak classifier cascade which includes Viola and Jones algorithm, and Histograms of Oriented Gradients (HOG) descriptors. The next stage is to extract features from detected face. The proposed system will use classic Histograms of Oriented Gradients (HOG) along with facial landmark detection technique; these detected features then passed through SVM classifier to predict the mood of the user. This predicted mood will stimulate the creation of playlist.

**Contents**

**1 EMOTION RECOGNITION USING FACIAL EXPRESSIONS 1**

* 1. Introduction . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1
  2. Motivation . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2
  3. Objectives of Work . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2

1. **LITERATURE SURVEY 3**
2. **PROBLEM STATEMENT 4**
   1. Recognization of Need . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
   2. Major Problems . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .4
      1. Inefficient Human Machine interaction. . . . . . . . . 4
      2. Time consumption in search of a suitable song.5
3. **SYSTEM ANALYSIS 6**
   1. Software Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 6
      1. Django . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 6
      2. Bootstrap . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7
      3. Python . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7
      4. CSS . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .7
   2. Data Collection . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .7
   3. Information Gathering Tools. . . . . . . . . . . . . . . . . . . . . . . . . . . 8
      1. Internet . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 8
      2. Our Own Knowledge . . . . . . . . . . . . . . . . . . . . . . . . . . . 8
   4. Algorithm . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 8
   5. UML Diagrams . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 11
      1. Class diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 11
      2. State diagram. . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . 11
      3. Use Case diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12
      4. Sequence diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . 13
      5. Activity diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 14
      6. Component diagram. . . . . . . . . . . . . . . . . . . . . . . . . . 15
      7. Deployment diagram . . . . . . . . . . . . . . . . . . . . . . . . . . 16
4. **CONCLUSION 17**

**6 REFERENCES**

**List of Figures**

4.4.1 Histogram of oriented Gradient (HOG). . . . . . . . . . . . . .9

4.4.2 Support Vector Machine. . . . . . . . . . . . . . . . . . . . . . . . . . . .10

4.5.1 Class Diagram. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .11

4.5.2 State Diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 11

4.5.3 Use Case Diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12

4.5.4 Sequence Diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 13

4.5.5 Activity Diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .14

4.5.6 Component Diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15

4.5.7 Deployment Diagram . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 16