

## Walchand College of Engineering, Sangli.

#### (An Autonomous Institute)

**Department Of**

#### Computer Science and Engineering

TY CSE Mini Project-III

Report

On

**Speech Emotion Recognition**

Submitted by

**Omkar Sharad Patil (2019BTECS00104)**

**Pratik Babaso Chougule (2019BTECS00102)**

**Pravin Santosh Lokhande (2019BTECS00084)**

Under the Guidance of

##### Mrs. P. D. Lanjewar

Guide

Computer Science & Eng. Dept, WCE, Sangli.

**2021-2022**



Walchand College of Engineering, Sangli

(An Autonomous Institute)

**Department Of**

**Computer Science and Engineering**

### CERTIFICATE

This is to certify that the Project Report entitled, **“Speech Emotion Recognition”** submitted by Mr. Omkar Patil, Mr. Pratik Chougule, Mr. Pravin Lokhande to Walchand College of Engineering, Sangli, India, is a record of bonafide Project work of course *“Mini Project-3”* carried out by him under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Computer Science & Engineering of the Institute.

|  |  |
| --- | --- |
| **Mrs. P. D. Lanjewar** | **Dr. M. A. Shah** |
| Guide | Head Of Department |
| Computer Sci. & Eng. Dept, | Computer Sci.& Eng. Dept, |
| WCE, Sangli. | WCE, Sangli |

# Acknowledgement

We would like to express our special thanks of gratitude to our guide Mrs P. D. Lanjewar mam as well as our HOD Dr. M. A. Shah who gave us the golden opportunity to do this wonderful project on the topic “Speech Emotion Recognition”, which also helped us in doing a lot of research and we came to know about so many new things. We are thankful to them.

Secondly, we would also like to thank the teammates who worked together in finishing this project within limited time. Finally, thanks to all who supported the project.

# Declaration

I hereby declare that work presented in this project report titled “**SPEECH EMOTION RECOGNITION”** submitted by me in the partial fulfillment of the requirement of the award of the degree of **Bachelor of Technology (B. Tech)** Submitted in the **Department of Computer Science & Engineering, Walchand College of Engineering, Sangli**, is an authentic record of my project work carried out under the guidance of Mrs. P. D. Lanjewar mam.

Date:

01-06-2022

Place: Sangli

(Omkar Patil)

2019BTECS00104

(Pratik Chougule)

2019BTECS00102

(Pravin Lokhande)

2019BTECS00084

## Table of Contents

1. [Project title](#_bookmark0) 6
2. [Abstract](#_bookmark1) 7
3. [Introduction and](#_bookmark2) Related work 8
4. [Problem statement](#_bookmark3) 8
5. Objectives 9
6. [Methodology](#_bookmark4) 10
7. [Project Diagrams](#_bookmark6)  11
8. Testing 12
9. Results and Conclusion 17
10. [References](#_bookmark11) 18

#### Project title

Speech Emotion Recognition

#### Abstract

Emotion recognition from speech signals is an important but challenging component of Human-Computer Interaction (HCI). In the literature of speech emotion recognition (SER), many techniques have been utilized to extract emotions from signals, including many well-established speech analysis and classification techniques. The goal of the human interface is to recognize the user’s emotional state precisely. In the speech emotion recognition study, the most important issue is the effective parallel use of the extraction of proper speech features and an appropriate classification engine.

#### Introduction and Related work

As human beings’ speech is amongst the most natural way to express ourselves. We depend so much on it that we recognize its importance when resorting to other communication forms like emails and text messages where we often use emojis to express the emotions associated with the messages. As emotions play a vital role in communication, the detection and analysis of the same is of vital importance in today’s digital world of remote communication. Emotion detection is a challenging task, because emotions are subjective. There is no common consensus on how to measure or categorize them. We define a SER system as a collection of methodologies that process and classify speech signals to detect emotions embedded in them. Such a system can find use in a wide variety of application areas like interactive voice based-assistant or caller-agent conversation analysis. In this study we attempt to detect underlying emotions in recorded speech by analysing the acoustic features of the audio data of recordings.

#### Problem statement

To create a platform which helps to predict the emotion of the users from their speech.

#### Objectives

* **To study the concepts of Deep Learning, Librosa and Python.**
* **To collect the Dataset.**
* **To train and test the model using the dataset.**
* **To check and maintain the accuracy of the model.**

#### Methodology

#### Collect the audio files from the dataset. Then we extract the features from the dataset

#### We use data of the audio files for the data pre-processing and visualization.

#### After that, we implement the program for the model.

#### Then, training of the model is done.

#### Testing the trained model.

#### Prediction of the emotion from the speech of the user.

#### We have Implemented three algorithms:

#### MLP Classifier

#### CNN

#### LSTM

#### MLP Classifier: Accuracy: 72.70%

#### Features: Chroma, MFCC, and mel

#### Dataset: Ravdess

#### CNN: Accuracy: 62.75%

#### Features: Chroma, MFCC, mel, zero crossing rate, root mean square

#### Dataset: Ravdess

#### LSTM: Accuracy: 98.79%

#### Features: MFCC

#### Dataset: TESS

#### Project diagrams

Data Augmentation

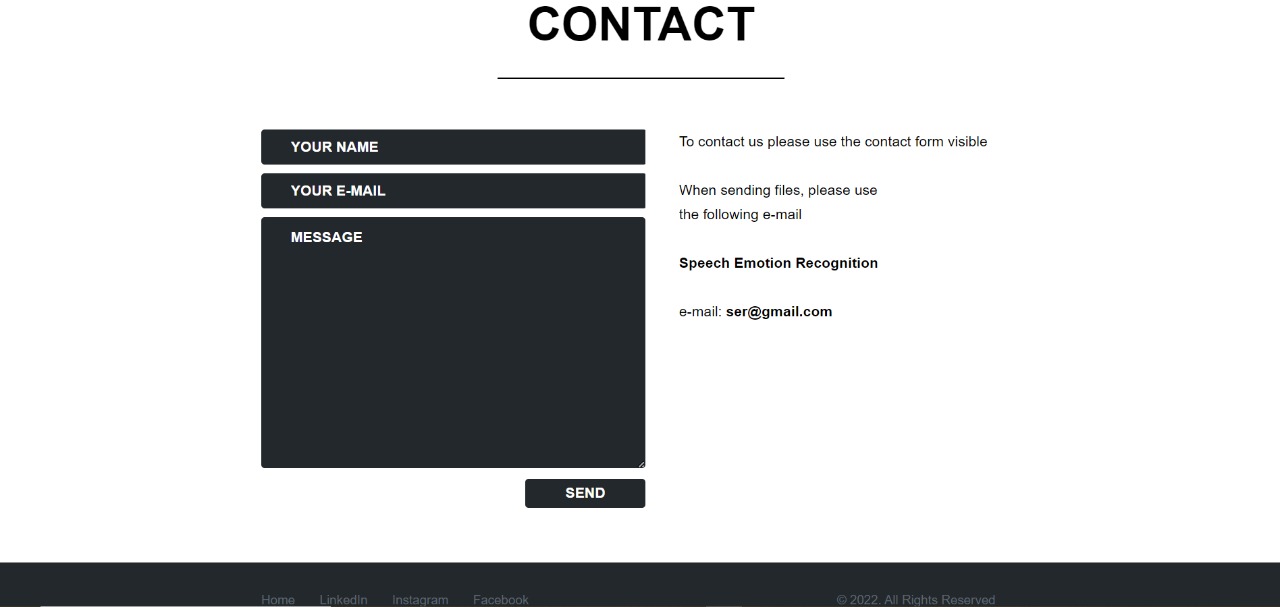
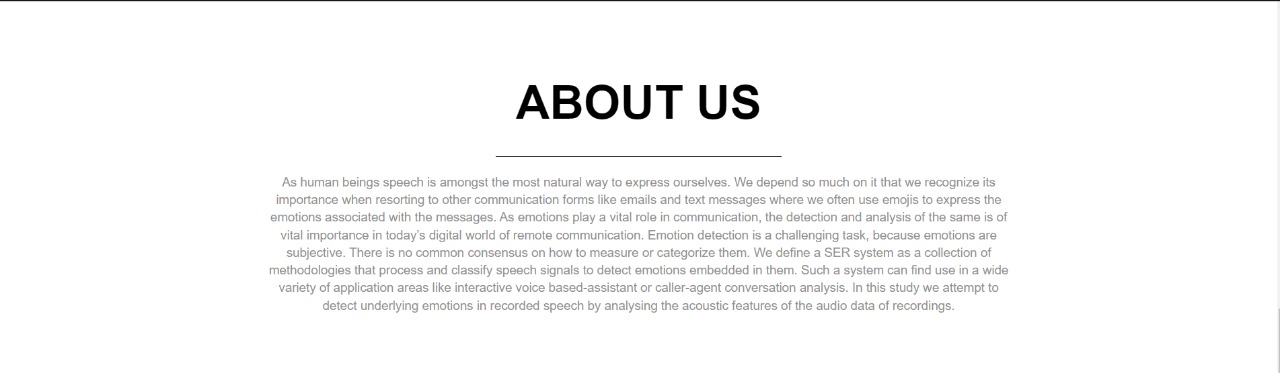
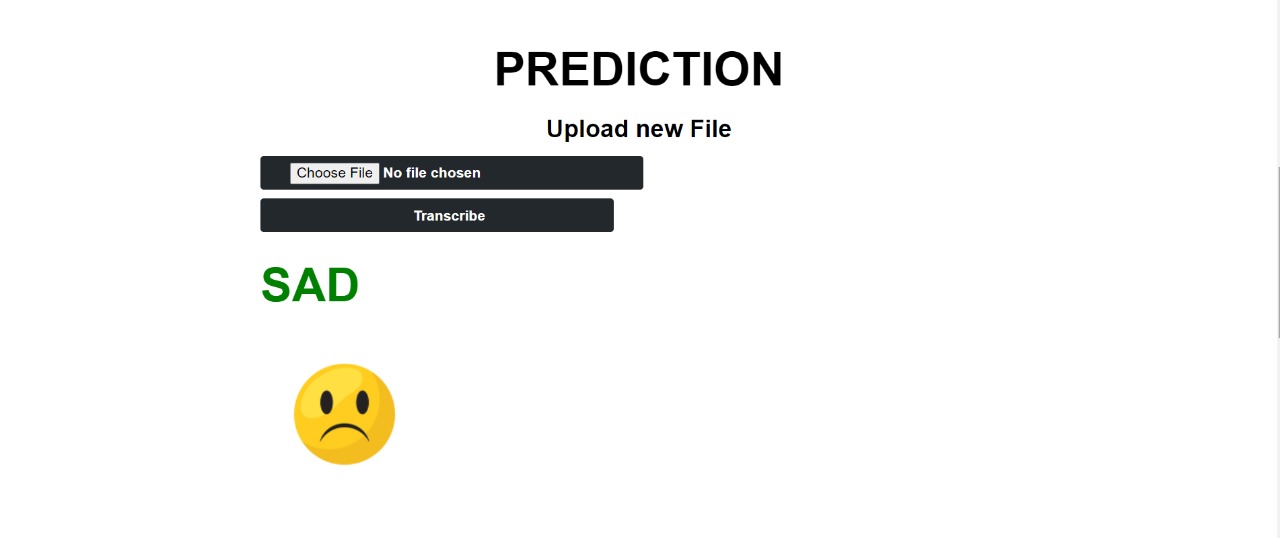
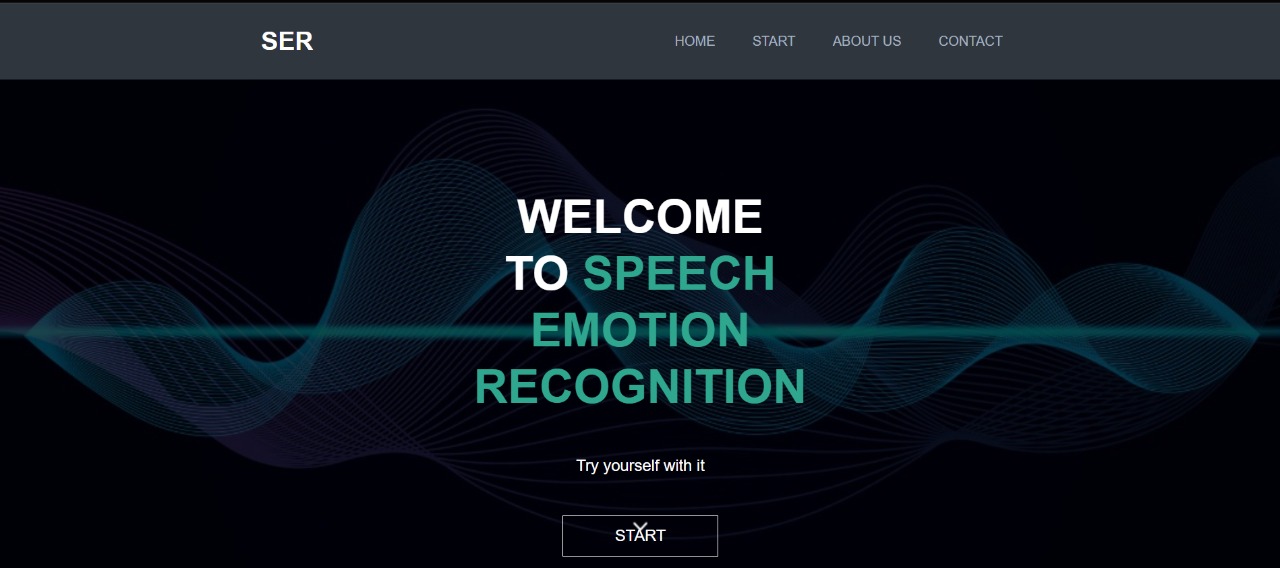
Feature Extraction

Training and Testing

Emotion Recognition

Load the Dataset

#### Testing



#### Results and Conclusion

* **Deep learning can be used effectively to predict the emotions of the users.**
* **This model will be beneficiary in certain sectors and will be user-friendly.**
* **Using the proposed model, we can classify number of emotions.**

#### References

* <https://www.ijrte.org/wp-content/uploads/papers/v7i4s/E1917017519.pdf>
* <https://en.wikipedia.org/wiki/Deep_learning>
* <https://ieeexplore.ieee.org/abstract/document/8805181>
* <https://smartlaboratory.org/ravdess/>