

# A Survey on Emotion Speech Recognition Using Support Vector Machine

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**Abstract:** Recognizing basic emotion through speech is the process of recognizing the intellectual state. Emotion identification through speech is an area which increasingly attracts attention within the engineers in the field of pattern recognition. Emotions play an extremely important role in human life. It is an important medium of expressing a human's viewpoint or feelings and his or her mental state to others. Humans have the natural ability to recognize emotions through speech information. Emotional computing has gained enormous research interest in the development of Human Computer Interaction over the past ten years. With the increasing power of emotion recognition, a logical computer system can provide a more friendly and effective way to communicate with users in areas such as video surveillance, interactive entertainment, intelligent automobile system and medical diagnosis. In this project, our approach is to classify emotions using Support Vector Machine classifiers. Recognition accuracy for these features is considered as it mimics the human ear perception. So emotion recognition using these features are illustrated.

**Keywords:** Emotion speech recognition, SVM Classification.

## 1. Introduction

### A. Introduction

Emotion speech recognition, which is defined as extracting the emotional state of a speaker from his or her speech. Recognizing basic emotion through speech is the process of recognizing the intellectual state. It is believed that speech emotion recognition can be used to extract useful semantics from speech, and hence, improves the performance. The word emotion describes a short-term, consciously perceived, valance state, either positive or negative. The main objective of employing (SER) Speech Emotion Recognition is to adapt the system response upon detecting frustration or annoyance in the speakers. The main objective of employing (SER) Speech Emotion Recognition is to adapt the system response upon detecting frustration or annoyance in the speakers. The input to the system will be a sequence of words spoken by the speaker. By using the algorithm Support Vector Machine classifiers form the given input we are going to identify the emotions like: Happy, Fear and Sad. Algorithm used is Support Vector

Machine(SVM) which is used as a classifier to classify different emotional states such as anger, sadness, fear, happiness, boredom. SVM is a simple and efficient algorithm which has a very good classification performance compared to other classifiers. SVM is the popular learning method for classification, regression and other learning tasks.

### B. Existing System

Since the late fifties, there has been tremendous research on speech recognition, which refers to the process of converting human speech into a sequence of words. However, despite the great progress made in speech recognition. This has introduced a relatively recent research field, namely speech emotion recognition, which is defined as extracting the emotional state of a speaker from his or her speech. A paper that has introduced the idea of shared nearest neighbors, using the shared Neighborhood Information. a KNN patent classification system based on shared nearest neighbors. Although we obtained the best score in the English patent classification task, the results are still not ideal. Aiming at the deficiency of the traditional k nearest neighbor algorithm cannot highlight the emotional characteristics of different parameters that have different effects and are based on the fuzzy set theory. Another system that used neural network technologies having aim to enable a very natural interaction among humans and machines. This dissertation proposes an approach to recognize the user's emotional state by analyzing signals of human speech. The performance highly depends on the emotional speech samples. So, it is necessary to take proper and correct speech samples. but it takes time at the time of execution.

## 2. Necessity of Work

The main objectives are:

- Speech Emotion Recognition is to adapt the system response upon detecting frustration or annoyance in the speaker's voice.
- The purpose of an emotion recognition system is to improve machine and human communication using knowledge related emotion in such a way that

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human machine interface becomes more efficient.

- SVM is a simple and efficient algorithm which has a very good classification performance compared to other classifiers.

### 3. Proposed System

The purpose of an emotion recognition system is to improve machine and human communication using knowledge related emotion in such a way that the human machine interface becomes more efficient. Such systems could be used to detect anger or frustration. In such cases, users could be restrained like driving a car. In emotion detection tasks, speech or face emotion detections are the most popular ones. Easy access to face or speech data made them very popular. Speech carries a rich set of data. In human to human communication, via speech information is conveyed. Acoustic part of speech carries important info about emotions.

#### A. System Architecture

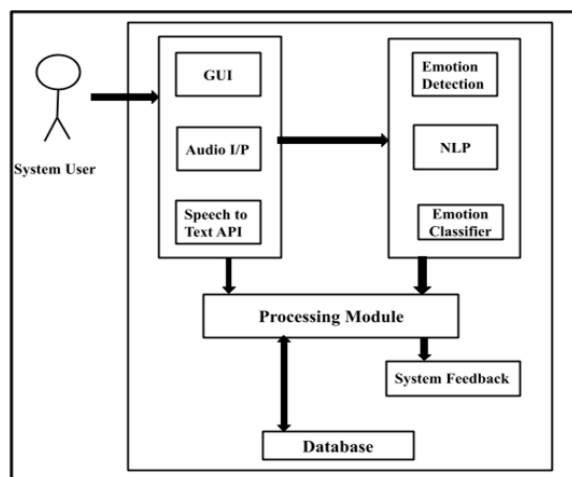


Fig. 1. Sentiment analysis architecture

The user gives speech input to the system. In the next part, the speech (voice) is now converted into text with the help of python libraries and can be further used for other purposes like sentiment analysis, etc.

### 4. Implementation

#### A. Tools

##### 1) Anaconda Navigator

Anaconda Navigator is a desktop graphical user interface (GUI) included in Anaconda distribution that allows you to launch applications and easily manage conda packages, environments, and channels without using command-line commands. Navigator can search for packages on Anaconda.org or in a local Anaconda Repository. It is available for Windows, macOS, and Linux. Navigator is an easy, point-and-click way to work with packages and environments without needing to type conda commands in a terminal window. You can use it to find the packages you want, install them in an environment, run the packages, and update them – all inside Navigator.

##### 2) Python

Python is a general-purpose coding language—which means that, unlike HTML, CSS, and JavaScript, it can be used for other types of programming and software development besides web development. That includes back end development, software development, data science and writing system scripts among other things.

##### 3) Pickle

As a developer, you may sometimes need to send complex object hierarchies over a network or save the internal state of your objects to a disk or database for later use. To accomplish this, you can use a process called serialization, which is fully supported by the standard library thanks to the Python pickle module. The serialization process is a way to convert a data structure into a linear form that can be stored or transmitted over a network.

### 5. Modules

#### A. Speech as input

The user give the speech input to the system.

#### B. Speech into text

In this part, the speech (voice) is now converted into text with the help of python libraries and can be further used for other purposes like sentiment analysis, etc. For this we are using a python library: speech\_recognition as sr. Copy.

#### C. Sentiment analysis

In machine learning, semantic analysis of a corpus (a large and structured set of texts) is the task of building structures that approximate concepts from a large set of documents. Sentiment analysis is the process of identifying and categorizing opinions using NLP to determine whether the speaker's attitude towards a particular topic/product is positive, negative or neutral. Sentiment analysis is a common NLP task, you will use the Natural Language Toolkit (NLTK), a commonly used NLP library in Python, to analyze textual data.

### 6. Conclusion

As technology evolves, interest in human like machines increases. Technological devices are spreading and user satisfaction increases importance. A natural interface which responds according to user needs has become possible with affective computing. The key issue of affective computing is emotions. Any research which is related with detection, recognition or generating an emotion is affective computing. User satisfaction or un-satisfaction could be detected with any emotion recognition system. Besides detection of user satisfaction, such systems could be used to detect anger or frustration. In such cases, user could be restrained like driving a car. In emotion detection tasks, speech or face emotion detections are the most popular ones. Easy access to face or speech data made them very popular. Speech carries a rich set of data. In human to human communication, via speech information is conveyed. Acoustic part of speech carries important info about emotions.

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