International Journal of Engineering Research & Management Technology ISSN: 2348-4039
November-2016 Volume 3, Issue-6
Email: editor@ijermt.org www.ijermt.org

PURPOSE OF EMOTION RECOGNITION IN DIFFERENT FIELDS

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ABSTRACT:
Speech emotion recognition is one of the major challenges in speech processing. Besides facial expressions or gestures, speech has proven as one of the most promising modalities for the automatic emotion recognition. To identify the emotions from the speech signal, many systems have been developed. This project presents the results from the application of a Naive Bayer classifier over various types of features. Automatic detection of emotions has been evaluated using standard Mel-Frequency Cepstral Coefficients (MFCCs), and pitch related features extracted from a speech segment. These segments contain a set of recorded sentences by actors and actresses who express different emotions. The classification performance is based on extracted features. The best results have approximately 78% of accuracy using proper layers and weights in the classifier. Classifying emotions with Naive Bayes provides quick probabilistic results and performs better than more sophisticated classifiers.

Key Words: Recognition, Emotion, Interact.

1. INTRODUCTION

More than a decade has passed since research on automatic recognition of emotion from speech has become a new field of research in line with its 'big brothers' speech and speaker recognition. Speech is the primary mode of conveying the message in human-human communication. It also contains paralinguistic information like speaker, stress, acoustic environment, person's intention, language, accent and dialect. Psychological research on human emotions claimed that there are six basic expressions of emotions that are universally displayed and expressed: happiness, anger, sadness, surprise, disgust and fear. This implies that these basic emotions are probably displayed and recognized cross culturally and speaker-independently.

Affective computing is the study and development of Systems and devices that can recognize, interpret process and, simulate human affects. The machine should interpret the emotional state of humans and adapt its behavior to them. Affective computing and human-centered computing have attracted lots of attention during past years. The idea behind is simple: even if automatic systems exists but certain quality is missing, namely recognizing and dealing with not only the semantic of user message but his/her emotional state as well. Emotions play an essential role in decision making, as well as in perception and learning and emotions influence rational thinking and therefore should be part of rational agents as proposed by artificial intelligence research. Emotion detection is rapidly gaining interests among researchers and industrial developers since it has a broad range of applications.

2. EMOTION RECOGNITION IN DIFFERENT FIELDS

EMOTION-AWARE SURROUNDING:

Quite an old idea is a computer controlled environment that adapts automatically on the user's mood by e.g. playing 'just the right music' or adjusting automotive system reaction.

BELIEVABLE AGENT:

The naturalness of an artifi cial 'being' and the appearance of intelligence is highly altered by emotional expressions; especially gaming applications can benefi t.

EMOTIONAL CHAT:
The high success of the so-called 'Emoticons' shows how strong the human desire is to express emotion in mode-restricted computer mediated communication (CMC). Special channels can be provided to facilitate this and analysis can be used to automate emotional labelling.

3. EMOTION

Emotion is a mental state that arises spontaneously rather than through conscious efforts and is often accompanied by physiological changes a feeling. Emotion is a process in which the perception of certain set of stimuli follows cognitive assessment which enables people to label and identify particular emotional state. At this point there will be an emotional physiological, behavioral and expressive response. Psychological research on human emotions claimed that there are six basic expressions of emotions that are universally displayed and expressed: happiness, anger, sadness, surprise, disgust and fear. This implies that these basic emotions are probably displayed and recognized cross culturally (i.e. language-independently), and speaker-independently.

4. CLASSIFICATION OF EMOTIONS

POSITIVE
Positive emotions express an attempt or an intention to Include. Working on, learning more viewpoints, interacting more with others, enjoying making things better. Positive emotions are fueled by an underlying desire for enjoyment and unity. For example: interest, enthusiasm, boredom, laughter, empathy, action, curiosity.

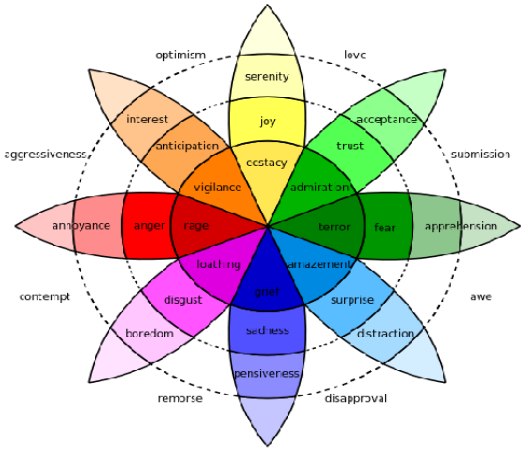

Figure 1.1: Human Emotions

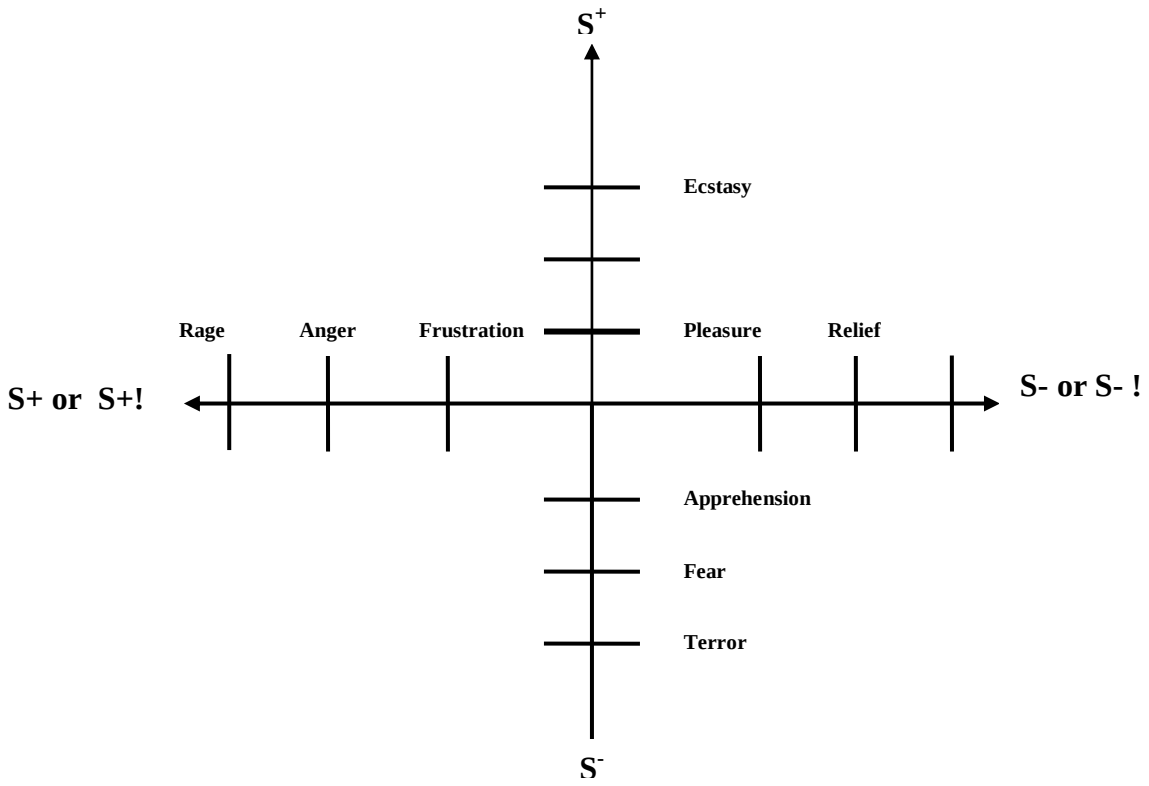

Figure 1.2: Positive and Negative Emotion

NEGATIVE

Negative emotions express an attempt or intention to Exclude Strengthening one's own position at the expense of others. Keeping bad stuff away, destroying when it is perceived as a threat. Negative emotions are fueled by an underlying fear of the unknown, a fear of the actions of others, and a need to control them or stop them to avoid being harmed for example: apathy, grief, fear, hatred, shame, blame, regret, resentment, anger, hostility. Nonverbal information appearing in human facial expressions, gestures, and voice plays an important role in human communication. Anger is expressed through facial expressions, gestures, and voice plays. Anger is classified as Hot Anger and Cold Anger.

NEGATIVE EMOTIONS AND THEIR IMPACT ON DECISION MAKING

- Firstly, negative emotions generally perceive uncertainty more pessimistically and offer lower estimates of probability of gains than controls.
- Secondly, negative emotions may influence decisions by altering the underlying motives.
- Thirdly, negative emotions may alter the style of information processing during decision making

5. EMOTION DETECTION THROUGH SPEECH IN COMPUTING

In the growing range of interactive interfaces, the research of emotional voice is still at an early stage, not to mention a paucity of literatures on real applications. To make the mainstream use of speech emotion recognition a reality, the industry must deliver robust and high-recognition accuracy close to human-like. Although progress has been impressive, there are still several hurdles that automatic emotion recognition from speech. Here we are going to put eye on technical challenges in automatic emotion recognition through speech.

LACK OF AGREEMENT ON DEFINITION OF EMOTION

One of the main difficulties results from the fact that it is difficult to define what emotion means in a precise way there are Blended emotions. The lack of agreement on definition of emotion also reflects on collection of databases. In everyday human computer interaction, however, the occurring emotions are very spontaneous. There, these variations are considerably higher as these are not any more prototypical emotions but may be shaded, mixed, or weak and hardly distinguishable. This makes the task much harder, so that further acoustic features need to be investigated.

SIGNAL ACQUISITION AND RECORDING SPEECH

The technical challenge is how to handle the often co-occurring additive noise including interfering speakers (arising from background) and convolute distortion (arising from a less expensive microphone or other data acquisition devices). The noise robustness problem is especially serious in changing acoustic environments. Amount of noise recorded on tape can jeopardize the reliability of acoustic analysis. Procedure of recording, of genuine spontaneous emotional speech, elicited emotional speech and enacted emotion has to be different. Recording of genuine emotion raises an ethics issue, as well as difficulties with emotional labeling and control of recording situation. A widely accepted recording protocol lacks also for the recording of elicited emotion.

UNIT OF ANALYSES

The goal of the audio segmentation is to segment a speech signal into units that are representative for emotions. Often, they span over more than one smaller unit; thus, they might be too long and the marking of specific and shorter emotional episodes might be smeared, resulting in sub-optimal classification performance. Most of the emotion recognition researches are based on short sentences. However, human beings speak continuously. People will change emotions when they are triggered by some incidents in the course of speaking. The short-sentence emotion recognition system may not be able to detect the emotional state correctly because there may have several emotions in a long conversation.

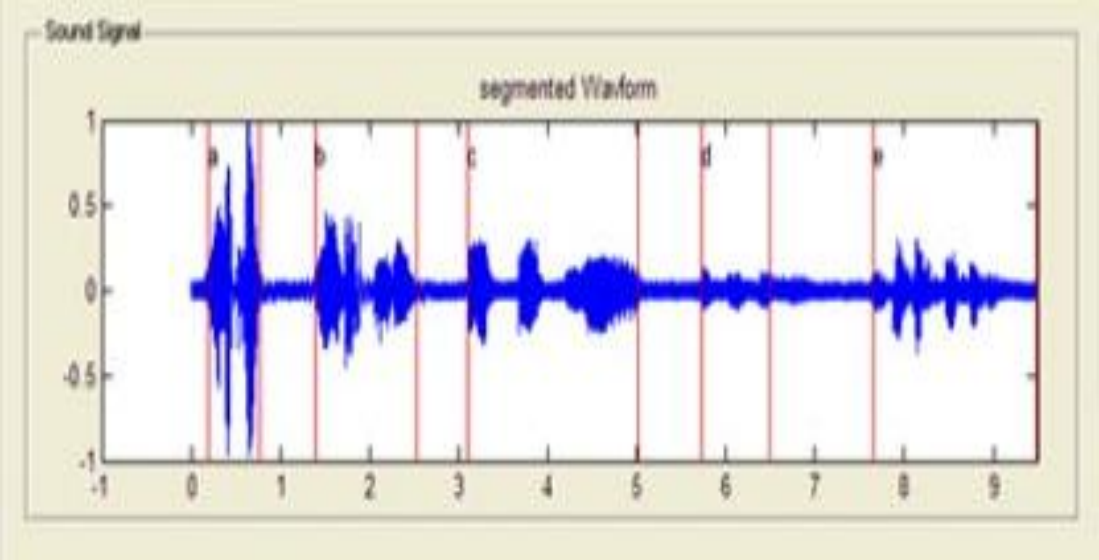

Figure 1.3: Speech Segmentation

6. CONCLUSIONS

In this paper, a system for anger recognition and classification is proposed. Evaluations that concentrate in identifying the effect of anger on vocal system are carried out. It is found that the characteristics of speech utterances are altered when producing stress or emotion. From this knowledge, the best acoustic features that are important for stress and emotion (Anger) detection are selected from several traditional features. The features such as pitch, amplitude, spectral distribution and speaking rate parameters function as basic acoustic parameters to characterize emotion.

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