CHAT EMOTION MAPPER

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Abstract

Internet has changed this world into the Global village. Communication is the only way to survive. There are several ways and channels to communicate each other. Nowadays, we are communicating with each other through different mediums like text messages, voice and video calls etc. Chatting is one of them. Understanding the moods each other can be a strong tool for better relationships. We often start chatting without knowing mood of our opponent and may get unpredictable responses. To avoid this we can start a topic according to the mood. To overcome this issue, a simple technique is proposed in this study. This study is undertaken to create an effective environment by chatting; where chatting is done through voice, the voice will be converted into text then applying simple techniques of data mining with Naïve Bayes, the emotions of the opponent will be sensed.

Keywords
Chat Chat mapper; Emotion extraction; Bayesian Network; Text; Speech; Voice.

1. INTRODUCTION

Chatting through text is common today; we may not be able to judge other person's current mood and we might start such a topic which does not suits other person's mood. This paper presents an approach to emotion estimation that assesses the content from textual messages. In this paper, the emotion estimation module is applied to text messages produced by a chat system and text messages coming from the voice-recognition system.

Our objective is to adapt a multimedia presentation by detecting emotions contained in the textual information through thematic analysis; we can determine how to communicate with fellow. The estimation of emotions or identification of personalities in chat rooms has several advantages mainly guarding the chatters from conflicting personalities and matching people of similar interests.

2. Material and Method

2.1 Related Work

Lot of work has been done for identification of emotions from text. Approaches that exist can be categorized (Holzman, L. E., & Pottenger, 2003) into non-verbal, semantic and symbolic.

Textual chat messages are automatically converted into speech and then instance vectors are generated from frequency counts of speech phonemes present in each message. In combination with other statistically derived attributes, the instance vectors are used in various machine-learning frameworks to build classifiers for emotional content (Holzman, L. E., & Pottenger, 2003). In (Anjewierden, A., Kolloffel, B., & Hulshof, C., 2007) two models for classifying chat messages using data mining techniques and also tested these on an actual data set, were used. The reliability of the classification of chat messages is proven by comparing the models performance to that of humans.

2.2 Java Speech API

Java Speech API (Enden, Jarkko, 2001) contains speech synthesis and speech recognition. Speech Recognition technology works by converting audio input containing speech into text. It has several phases through which speech is converted into text with some accuracy. Also some third party API is also available on the basis of Java Speech API.

2.3 Bayesian Network

Classification is a basic task in data analysis and pattern recognition that requires the construction of a classifier, that is, a function that assigns a class label to instances described by a set of attributes. The induction of classifiers from data sets of preclassified instances is a central problem in machine learning.

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Numerous approaches to this problem are based on various functional representations such as decision trees, decision lists, neural networks, decision graphs, and rules (Friedman, N., Geiger, D., and Goldszmidt, 1997).

3. Chat Emotion Mapper: CHATEM

3.1 Approach

The current approach will first convert voice into text. Speech recognition systems in early days were used to apply a set of grammatical and syntactical rules to speech, when spoken words fit into a certain set of rules, the program could determine what the words were. However, human language has several exceptions to its own rules, even when it's spoken constantly.

In (Bassili, J.N., 1996) facial expressions are used to communicate emotions. Nowadays speech recognition systems use powerful and complex statistical modeling systems. These systems use probability and statistical functions to determine the most expected outcome. The two models that rule the field today are the Hidden Markov Model and neural networks. These methods contain complex mathematical functions, but essentially, they take the information known to the system to figure out the information hidden from it. The Hidden Markov Model is the most common. In this process, the program starts by assigning a probability score to each phoneme, based on its built-in dictionary and user training. There is some art into how one selects, compiles and prepares this training data for "digestion" by the system and how the system models are "tuned" to a particular application.

Table1. Emotion icons

S No.	Emotion Name	Emotion Shape
1	Happy	
2	Sad	
3	Angry	
4	Fear	

Then we analyze text and apply following four processes. These processes are:

1. Parsing Phase
2. Emotion Extraction Phase
3. Negation Detection
4. Sentence Tagging

In section 3.2 all these four processes will be discussed

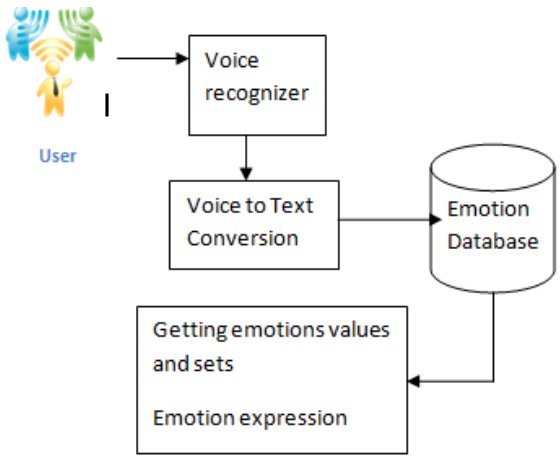

Fig. 3 System Architecture diagram

3.2 Processes

3.2.1 Parsing Phase

The first stage after receiving an input sentence is to create a parse tree using the Stanford Parser. The parser works on the grammatical structure of sentences, for example: which groups of words from sentence go together as "phrases" and which word is the subject or the object of a verb. We also analyze it in order to find if there is a negation.

3.2.2 Emotion extraction phase

At this phase we assign every word with an object that will hold the following information: array of emotions (happiness, sadness, anger, fear, surprise and disgust), negation information, the dominant emotion of the word and the word itself. Once we've established the POS type for each word in the sentence, we proceed by extracting the possible senses hidden behind each word using (Fellbaum, C. WordNet, 1998) Jwordnet (Jwordnet is a large lexical database of English) In this database, nouns, verbs, adjectives and adverbs are clustered into group of

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cognitive synonyms known as "synsets", each of them are describing a different concept. Synsets are related to each other by means of conceptual-semantic and lexical relations, causing the formation of a network of meaningfully related words and concepts to construct a mapping between synsets offsets from WordNet, and one of the possible emotion types. In order to do that, we needed to choose base words that will represent each of the emotion types. At the end of this stage we now know which of the synsets has an emotional value as described above, allowing us to update the emotion array of the object holding the word being analyzed, and eventually assign a word with its most probable emotional sense out of the possible emotional senses available.

3.2.3 Negation detection

The intuitive way to deal with negation is to emphasis the counter emotion of the emotion found as most dominant in the word. For example "Happy" and "Sad", the negation will turn a word marked with emotional value "Happy", to be marked with emotional value "Sad" and vice versa.

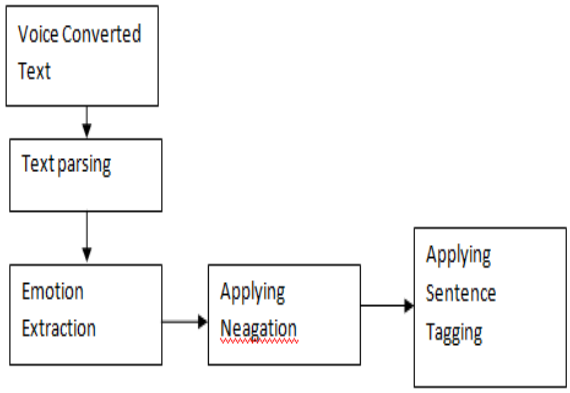

Fig. 2 Thematic analysis emotion extraction

3.2.4 Sentence tagging

The method we use to deal with multi-emotional sentence is: When we reach a word with an emotional value, we open an appropriate tag and close this tag either when we reach a word with a different emotional value, or at the end of the sentence. In case we reached a word with a different emotional value, we open a new emotion tag and in case that the emotional value is similar to the previous one, we continue on to the rest of the sentence.

4. Discussion and Conclusion

Above mentioned technique was repeatedly applied to different group of users, we come to know that, Java Speech API was not accurate 100% and there was limitation and initially results were not appealing, but it performed well on chatting done using text messages.

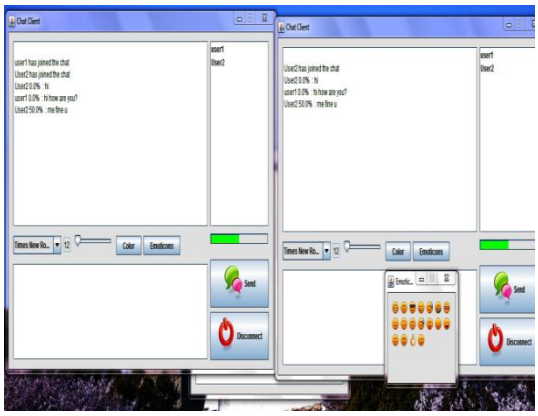

Fig. 3 chat using chatem

5. Future Research Work

In our future work, we plan to improve the Emotion Estimation module, e.g. by integrating the recorded user (client) information into the analysis of emotions. According to (Ma, Chunling, Helmut Prendinger, and Mitsuru Ishizuka, 2005), past emotional states could be important parameters for deciding the affective meaning of the user's current message. Some analysis of voice features like pitch, frequency and tone can help us to identify emotions and mode of user.

6. References

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