EMOTION RECOGNITION FROM TEXT

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ABSTRACT

Emotions can be expressed in a variety of ways, including facial expressions, gestures, words, and written text. Emotion recognition in text documents is basically a classification problem based on the concept of NLP domains. This article describes emotion estimation based on textual data and emotion detection techniques.

KEYWORDS

Textual Emotion Detection; Emotion Word Ontology; Human-Computer Interaction

1. INTRODUCTION

Detection of emotional nation of someone with the aid of using analysing textual content messages in communique among to humans written with the aid of using him/her seem difficult however additionally crucial often because of the truth that maximum of the instances textual expressions aren't simplest direct the use of emotion phrases however additionally end result from the translation of the that means of principles and interplay of principles which can be defined withinside the textual content document.Acknowledging the emotion of the textual content performs a key function in man-system interplay. Emotions may be expressed with the aid of using someone`s word, facial features and written textual content. Enough paintings has been performed regarding speech and reputation of facial feelings, however emotion reputation structures primarily based totally on textual communique nevertheless want interest from researchers .In computational linguistics, the detection of human feelings withinside the textual content turns into increasingly more vital from an utility standpoint.

The emotion is expressed as happiness, sadness, anger, surprise, hatred, fear, and so on. Because there may be no hierarchy of fashionable feelings, cognizance your interest.. In 2001, W. Gerrod Parrot, wrote a ee-e book named “Emotions In Social Psychology”, wherein he defined the emotion gadget and officially categorised the human feelings via an emotion hierarchy . These are in six classes for instance. Love, Joy, Anger, Sorrow, Fear and Surprise. Some different phrases likewise fall into the secondary and tertiary levels.Guidance for boosting the competencies of cutting-edge textual content-primarily based totally emotional sensing techniques is supplied on this document.

2. RELATED WORK

The role of emotion in computational human interaction was suggested by Picard's concept of emotional calculus. Following this trend, research in the field of detecting emotions from textual data emerged, determining human emotions from different perspectives. The problem of emotion recognition in text can be formulated as follows: Let F be the whole of all emotions, A be the whole of all writers, and U be the whole of all possible expressions of emotional text. If s is a function that reflects the emotion e of the author a from the text t, that is, r: A x U F, then the function s is the solution to the problem.

The main problem with emotion recognition systems is the fact that the definitions of F and U are simple, but even a subset of both sets of F and U are very confusing in the definition of individual elements. On the

one hand, new elements can be added to Set U as the language continues to emerge. On the other hand, due to the complexity of the human mind, there is currently no standard classification of "all human emotions", and all emotion classifications are as "labels" annotated after the fact for various purposes. Can only be displayed. The methods used for text-based emotion recognition systems are:

2.1. Keyword Detecting Method

The problem of keyword pattern matching can be described as the problem of finding keywords in a particular set as substrings of a particular string. This problem has been studied in the past and algorithms have been proposed to solve it. In the context of emotion recognition, this method is based on certain predefined keywords. These words fall into categories such as tiredness, sadness, happiness, anger, scary, and surprise. Figure 1 shows the keyword detection method process. The emotion detection keyword detection technique consists of five steps, shown in Figure 1, where the text document is taken as input and the output is generated as an Animation class. The first step is to convert the text data into tokens from which emotional words are identified and recognized. First, this technique takes the text as input and the next step is to perform tokenization on the input text. Emotion-related words are identified in the next step, after which an analysis of emotional word intensity is performed. The sentence is checked for negatives and finally the emotion class is detected as the required output.

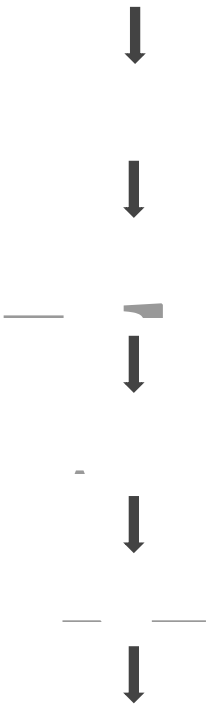


Figure 1. Keyword Detecting Method

2.2. Lexical Affinity Method

Identifying emotions based on related keywords is an easy and easy way to use. The lexical affinity approach is an extension of the keyword detection technique. In addition to picking up emotional keywords, assign random words a probabilistic "affinity" for a particular emotion. These probabilities are often part of the language corpus, but they have their drawbacks. First, the assigned probabilities are directed to the corpus-specific text genre, and second, emotional content deeper than the word level at which this technique works is overlooked. For example, the word "accident", which is likely to indicate negative emotions, does not correctly contribute to the emotional evaluation of phrases such as "avoid accidents" or "accidentally met a girlfriend."

2.3. Learning-based Methods

The learning-based method has a different problem formulation. Originally the problem was to determine emotions from the input text, but now the problem is to classify the input text into different emotions. In contrast to keyword-based detection methods, learning-based methods apply different machine learning theories such as support vector machines [8] and conditional random fields [9] to determine which emotion category. Attempts to detect emotions based on previously trained classifiers that determine. You should hear the input text.

2.4. Hybrid Methods

Because the thesaurus-based keyword-based and naive learning-based methods did not produce satisfactory results, some systems used a hybrid approach that combined both keyword detection techniques and learning-based methods. The accuracy is improved. The most important hybrid system to date is the study of Wu, Chuang, Lin [11], which uses a rule-based approach to extract semantics related to specific emotions and uses the Chinese vocabulary ontology. Extract the attributes. These semantics and attributes are associated with emotions in the form of emotional correlation rules. As a result, these emotion mapping rules replace the original emotion keywords and act as a training feature for the separable mixed model-based learning module. This method is better than the previous approach, but the emotional category is still limited.

2.5. Limitations

From above discussion there are few limitations [7]:

2.5.1. Ambiguity in Keyword Definitions

Emotion keywords make it easy to find related emotions. Most words can change their meaning depending on their usage and context, so the meaning of a keyword can be varied and ambiguous. Moreover, even with a minimal set of emotion labels (without all synonyms), in extreme cases, B. ironic and cynical sentences have different emotions.

2.5.2. Unable to recognize sentences without keywords

Keyword-primarily based totally method is absolutely primarily based totally at the set of emotion keywords. Therefore, sentences with none key-word could mean that they do now no longer incorporate any emotion at all, that's glaringly wrong. For example, “I exceeded my qualify examination today” and “Hooray! I exceeded my qualify examination today” ought to mean the identical emotion (joy), however the former without “hooray” may want to continue to be undetected if “hooray” is the most effective key-word to stumble on this emotion.

2.5.3. Lack of Linguistic Information

The syntactic structure and semantics also influence the emotions expressed. For example, "I laughed at him" and "He laughed at me" suggest different emotions from a first-person perspective. Therefore, ignoring linguistic information is also a matter of keyword-based methods.

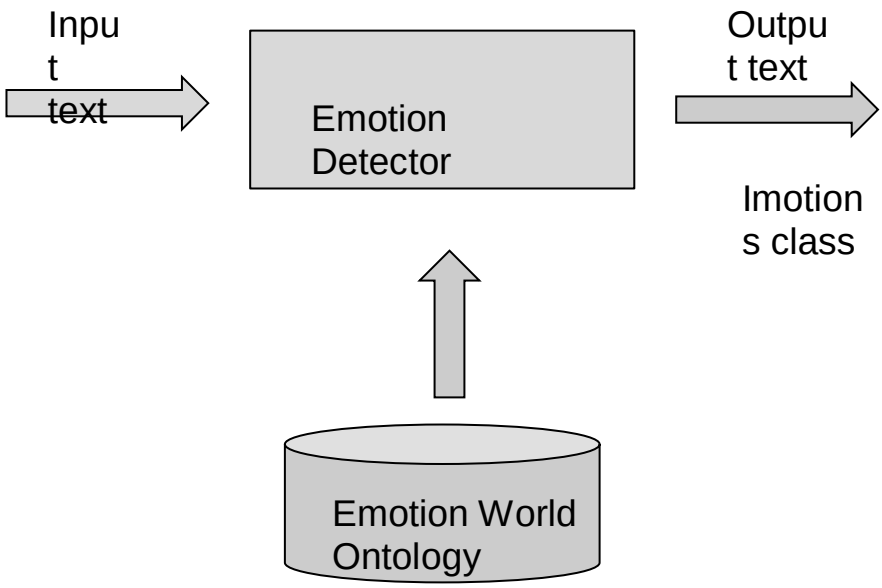
2.5.4. Difficulties in Determining Emotion Indicators

The learning-based method can automatically determine the probability between traits and emotions, but the method requires keywords, but it is a form of trait. The most intuitive feature can be emoji, which can be seen as an emotional annotation of the author of the lyrics. The problem of cascading is the same as for the keyword-based method.

3. INTRODUCED ARCHITECTURE

The methods described in Section II have been modified and integrated to extend functionality and improve performance, and the simple and straightforward model shown in Figure 2 has been developed.

The framework is divided into two main components: Emotion Ontology and Emotion Detector.



3.1. Emotion Ontology

Ontologies are explicit specifications of conceptualization. Ontologies have high-level schema-like aspects and entity- and attribute-like aspects [16]. Interrelationships are between the vocabulary of an entity, a domain. Ontologies provide an understanding of a particular domain. Ontologies enable domain communication between people, institutions, and application systems. The emotional word hierarchy is transformed into an ontology. The hierarchy of this emotional word is W.G. Developed by Aum. The ontology development tool Protégé [13] is used to develop emotional ontology. The proposed ontology has a form of relationship between classes and subclasses. The primary level emotion class of the emotion hierarchy is at the top of the emotion ontology, and the tertiary level emotion class is at the bottom of the ontology. Higher-level emotion classes are assigned a high weight age, and lower-level emotion classes are assigned a younger age.

3.2. Emotion Detector Algorithm

With the help of this emotion recognition algorithm, you can recognize emotions in text data. The algorithm calculates the weight of a particular emotion by adding the weight assigned at each hierarchy level, calculates the same for the opposite emotion, compares the two ratings, and recognizes the larger rating. Consider it as a feeling that has been done.

3.2.1. Parameters Used

The algorithm is designed to be able to calculate and sort the weighted ages assigned to words of different emotions. This requires certain parameters. The first step is to calculate the parameters. This task is solved with the help of the Jena library, which allows you to explore and analyze ontology.

The various parameters are calculated as follows:

3.2.1.1. Parent-Child relationship

If the text document belongs to a child. It also indirectly refers to its parent. Therefore, if a particular value is added to the child's score, the parent's score must also change. This is achieved by first traversing the width of the ontology model using the Jena API. If any node is found, all its children will be retrieved. Then the same method applies to each child.

3.2.1.2. Depth in Ontology

This is necessary so that you can see how specific the term is in relation to the corresponding ontology structure. The more specific you are, the more weight you need to give. This value is calculated simultaneously while traversing the ontology tree.

3.2.1.3. Repetition in Text document

This is also an important parameter. The more frequently you use it, the more important this term becomes. This value is calculated by analyzing the text document and looking for the appearance of the word.

3.2.2. Algorithm

The following algorithm has been proposed to calculate the score for each emotional word using the parameters from the previous step. This score is directly proportional to the frequency of the term and inversely proportional to the depth of the ontology. Therefore, the formula developed for the mth term. The corresponding score is calculated for each base level emotion class. Finally, the emotion class with the highest score wins the race and is declared as the emotional state of the corresponding text document. The algorithm is:

for j 1 to No. of Nodes [Ontology]
do parent [j] parent of node j
child [j] child of node j
for m 1 to No. of Nodes [Ontology]
do freq [m] frequency of occurrence of mth
depth [m] depth of mth node in ontology

Calculate (x):

for m 1 to No. of Nodes [Ontology]
score (x) freq [root] / depth [root]
for m 1 to No. of parent nodes [Ontology]
score (parent) = score (parent) + score (child)
return score (parent)
for m 1 to No. of parent nodes [ontology]
emotion class High score [parent]
return emotion class

Nodes [Ontology] indicates the class of the ontology, Parent [j] indicates the parent class of the ontology, Child [j] indicates the child class of the ontology, and Freq [m] indicates the frequency of occurrence of the mth class in the text. Indicates. , Depth indicates the depth of the class to the ontology, and Score [Parent] indicates the score of the parent in the ontology.

Through the proposed algorithm, you can determine the scores for the major emotion classes. The emotion class with the highest score is determined as the last emotion class for the blog.

4. CONCLUSION

Emotion recognition can be seen as an important area of research in human-computer interaction. Researchers are doing enough work to detect emotions from facial and voice information, but detecting emotions from textual data is still a fresh and hot field of study.

This article reviews the methods currently used to detect emotions from text and their limitations, and proposes a new system architecture that works efficiently.

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