

Emotion Classification of Microblogs Based on Appraisal Theory

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Services and social networks that allow their users to communicate on web are nowadays wide-spread among people in all age categories. One of these new forms of web communication is a microblog. It is a service that allows users to express their feelings, opinions and ideas and makes them public to everyone, who is interested in what other users write. Moreover, one of the most significant differences in comparison to other social networks is the limitation of the length of a microblog to 140 characters.

Opinions and ideas that users write in their microblogs are very valuable. For example, companies all around the world are paying large amounts of money for surveys whose aim is to retrieve opinions of customers on products of a company, to find out what they consider as positive or negative about their products or services. There is also a non-commercial usage of opinion mining, e.g., when we want to find common interests between groups of people, or just want to find a new friend who is interested in the same topics as you.

In our work we did a research in the field of emotion and opinion mining. We focus on utilization of Appraisal theory for emotion classification in microblogs. This theory says that emotions are consequences of how an author appraised some situation. The theory is used in emotion analysis to discover what an author feels and what the situation that caused this feeling is. Our aim is to explore suitability and applicability of the theory in relation to the specifics of user-generated microblog content.

When using appraisal theory, it is necessary to have a good dictionary of terms and phrases that are tagged with keywords from this theory. We built an own dictionary using known appraisal terms and extended them with synonyms using WordNet.

Our method has four steps that allow us to improve emotion analysis in microblogs: (i) Microblog pre-processing, (ii) main target identification, (iii) emotion extraction, (iv) emotion graph composition.

In our method to resolve which word is a target of a sentence we used syntax patterns specific to microblogs. We created them manually according to a syntax

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analysis of hundreds of microblogs. After we know what the targets of sentence are, we assign identified words from the appraisal dictionary to them. Every word, which we tag as relevant, is being searched in appraisal dictionary. According to its appraisal category, we assign a numerical value to it, which represents its attitude. Coefficients for each appraisal type were derived experimentally. These values are used in final step of our method where user target-emotional graph is created. There are two kinds of nodes – users and targets in this graph. The edges between these nodes are vectors with values:

- count of microblogs,
- dominant appraisal – appraisal type which occurred most often,
- intensity – normalized sum of classified orientation values of microblogs.

Using this graph it is easy for each user to find out the most favourite topic (determined by targets) or the most hated topic. We can also specify how much and in what way he likes / does not like the target.

To evaluate the accuracy of our method we conducted two initial experiments. Firstly we classify 5000 microblogs according to their polarity and compared results to manually annotated polarities. In this experiment we achieved 85 % accuracy.

In our second evaluation experiment we manually annotated the main target of microblogs and their appraisal type. We executed all three steps of our method – including target graph creation. We achieved 70% accuracy of assigning appraisal expressions to targets.

The results we obtained are comparable to other works [1, 2, 3]. In comparison to other works, our method is independent of topic of microblogs. We proved by the evaluation that despite microblog's weaknesses (in terms of quantity of content to analyse) our method can effectively classify emotions of random microblogs with different topics.

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References

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