

Analyzing Appraisal Automatically

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Abstract

We present a method for classifying texts automatically, based on their subjective content. We apply a standard method for calculating semantic orientation (Turney 2002), and expand it by giving more prominence to certain parts of the text, where we believe most subjective content is concentrated. We also apply a linguistic classification of Appraisal and find that it could be helpful in distinguishing different types of subjective texts (e.g., movie reviews from consumer product reviews).

Classifying Sentiment

The task of classifying texts based on their subjective content, or sentiment, is considered to be difficult to implement computationally. There is, however, a growing body of research both in computational and theoretical linguistics that attempts to classify and quantify subjective content. In this paper, we describe our current attempts at designing a system to perform an automatic analysis of sentiment.

We started out by using an existing method for calculating the semantic orientation of adjectives in a text (Turney 2002), but instead of simply averaging the semantic orientation of certain words in the text (in our case, adjectives), we took into account text structure. We also improved on the method by applying Appraisal, a linguistic classification of subjectivity (Martin 2000).

Our system was developed using a corpus of 400 opinion texts, reviews retrieved from the website Epinions.com, divided into 200 classified as “recommended” by the authors (positive), and 200 as “not recommended” +.8458420.5052 70d (the)Tjgat4.7438 0 Td (v)Tj 4.91113 0 Td (ersity) -71.68a

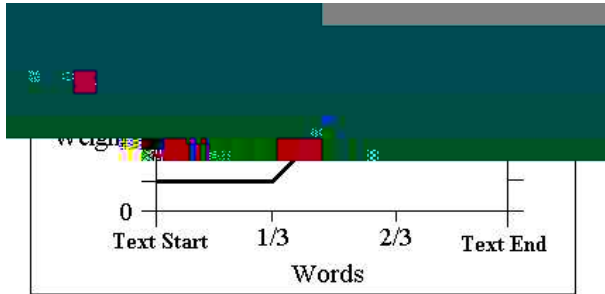


Figure 1: Prominence schema.

ions expressed in a text will tend to be found in specific parts. Intuitively, those parts should be the middle and the end. Especially in reviews, authors tend to end with a summary statement of their opinion. In order to implement this theory, when analyzing a text, we weight every adjective's SO based on where it occurs in the text.

We experimented with a number of sets of peaks and troughs, defined by four points in the text, and we weighted every word according to this scheme (see Figure 1), so that $ord_w = (ord_{SO})(weight)$. These weighted SO values were then averaged to determine a text's overall SO. The result was compared to the author's

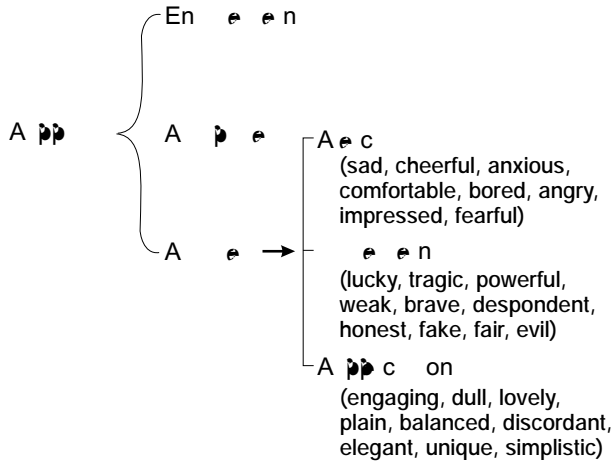


Figure 2: Appraisal systems.

mostly contain Affect, while a review of a restaurant’s service would consist of Judgment, and a literary review, of Appreciation. A combination could be used too: a concert reviewer might consider the quality of the music (Appreciation) but also comment on the showmanship of the musicians (Judgment).

We consider the potential of one such method for Appraisal-based review classification. Like Turney’s method for measuring a review’s semantic orientation, this method is based on adjective frequency. Except that here, it is assumed that a review’s degree of Affect, Judgment and Appreciation can be determined by counting adjectives used to express each type. If every adjective was used only to express one of these three basic types of evaluation, then we would simply need to compile three lists of adjectives: if a document was found to contain four Affect adjectives, five Judgment adjectives and one Appreciation adjective, it would be deemed to be 40% Affect, 50% Judgment and 10% Appreciation (an evaluation, perhaps, of a preacher or of a politician). Of course, this is not the case: adjectives have the potential to express Affect, Judgment and Appreciation depending on the context in which they are used. We must therefore find some way to determine an adjective’s overall *evaluative potential*—the probability that an adjective will be used in evaluative discourse to express Affect, Judgment or Appreciation.

Adjective	Affect	Judgment	Appreciation
Afraid	0.66	0.34	0.00
Aware	0.44	0.54	0.02
Cute	0.12	0.44	0.44
Great	0.01	0.11	0.88
Happy	0.67	0.32	0.01
Intelligent	0.16	0.77	0.07
Little	0.71	0.18	0.11
Quick	0.15	0.72	0.13
Red	0.14	0.25	0.61
Weak	0.39	0.51	0.10

Table 3: Appraisal values from corpus.

Subject	Affect	Judgment	Appreciation
Books	23	27	50
Computers	20	24	56
Hotels			