Appraisal Navigator

Navendu Garg
Illinois Institute of Technology
10 W 31st State Street
Chicago, Illinois 60616
gargnav@iit.edu

Kenneth Bloom
Illinois Institute of Technology
10 W 31st State Street
Chicago, Illinois 60616
kbloom1@iit.edu

Shlomo Argamon
Illinois Institute of Technology
10 W 31st State Street
Chicago, Illinois 60616
argamon@iit.edu

ABSTRACT

Much interesting text on the web consists largely of opinionated or evaluative text, as opposed to directly informative text. The new field of 'sentiment analysis' seeks to characterize such aspects of natural language text, as opposed to just the bare facts. We suggest that 'appraisal expression extraction' should be viewed as a fundamental task for sentiment analysis. We define an 'appraisal expression' to be a piece of text expressing some evaluative stance towards a particular object. The task is to find these elements and characterize the type and orientation (positive or negative) of the evaluative stance, as well as its target and possibly its source. Potential applications of these methods include new approaches to the now-traditional tasks of sentiment classification and opinion mining, as well as possibly for adversarial textual analysis and intention detection for intelligence applications.

Categories and Subject Descriptors: H.3.3 Information Storage and Retrieval:Information Search and Retrieval, I.2.7 Artificial Intelligence:Natural Language Processing [Text analysis], H.3.1 Information Storage and Retrieval:Content Analysis and Indexing [Linguistic processing]

General Terms: Algorithms, Experimentation

Keywords: Appraisal Extraction, Opinion Mining, Sentiment Analysis, Shallow Parsing, Appraisal Theory

1. INTRODUCTION

The task of 'sentiment analysis' is to find and characterize aspects of opinionated natural language. We define an 'appraisal expression' to be a piece of text expressing some evaluative stance towards a particular target. By analogy to information extraction, we consider representing appraisal expressions as frames filled with several values for several slots. Thus, an appraisal expression comprises: Source, Attitude, and Target. We have developed a prototype system for navigating in a body of texts based on extracted appraisal expressions. Currently, the system extracts adjectival appraisal expressions only. To extract an appraisal expression, the system first finds adjectival appraisal groups[1](a *head adjective* with defined **attitude type** and an optional preceding list of *appraisal modifiers*). It then extracts the target groups by matching phrases in the lexicon to the phrases in the text and assigns the target type assigned in the lexicon.

SIGIR'06, August 6–11, 2006, Seattle, Washington, USA.
ACM 1-59593-369-7/06/0008.

Once the system extracts the attitude groups and the appraised things, it tries to associate each attitude group with a target using hand-selected list of acceptable paths through the deep dependency parse tree of a sentence.

$$\text{appraised} \xrightarrow{nsubj} x \xleftarrow{dobj} y \xleftarrow{amod} \text{appraisal}$$

This linkage selects the subject of a sentence like where the appraisal modifies a noun in the predicate (e.g. "The Matrix" in "The Matrix is a very good.").

Each extracted expression is analyzed to give a high-level generic representation of the meaning of the appraisal expression in terms of its evaluative function in the text. For example, in "I found the movie quite monotonous" the speaker (the Source) adopts a negative Attitude ('quite monotonous') towards the Target ('the movie'). Using data mining we extracted association rules to determine which aspects of a target people like or dislike, and in which ways.

2. APPRAISAL NAVIGATOR

Appraisal Navigator[1] is a web interface for the prototype system. Using the interface a user can submit three types of queries:

1. Query to find relevant appraisal expression rules.
2. Query to find relevant documents for a given appraisal expression and relevant keywords.
3. Query to find relevant sentences for a given appraisal expression and relevant keywords.

A typical query, comprising an appraisal expression like (attitude = affect, orientation = positive, appraised = digital cameras) and relevant keywords like 'excellent' or 'amazing', will return the matched rules. The user can hover on each rule and see the related documents or sentences. Further, the user can select one of the rules and re-submit it as a new query. This user-interface can function as useful tool for detailed analysis of public opinion about various targets.

3. REFERENCES

[1] Casey Whitelaw, Navendu Garg, and Shlomo Argamon. Using appraisal groups for sentiment classification. In *Proc. Conference on Information and Knowledge Management*, Bremen, Germany, 2005.

[1]http://lingcog.iit.edu/appraisalnavigator/