Twitter Profile Building by Sentiment Analysis

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Objectives

- Micro-blogs are a challenging new source of information for data mining techniques.

- They are social tools and therefore, are a source of valuable real-time data.

- Twitter is a very popular microblogging service where users create status messages (called "tweets"), which reflect the personality of the user.

- Analyzing these tweets can help us build a personality profile of the user, which would help other users follow the people they want.

Other kinds of Tweets

- Retweets

- Tweets containing the target and published by the same person.

- Tweets replying to or replied by the tweet are to be classified, as well.

Procedure

- Data Collection

- Keyword Classification

- Sentiment Analysis

- Association of sentiments with keywords

- Building the profile of the user

- e.g. If a user tweets positively about Android and negatively about iPhone, output would be:

  <username> (Android +) (iPhone -)

Steps Involved

- Sentiment Analysis

- Binary SVM classifier

- OpenNLP POS tagger

- Word stemming

- Syntactic parsing

- Handling Target-independent Features

- Handling Extended Targets

- Handling Target dependent features

- Building a corpus by searching for keywords from a white list

- Evaluation and representation

Approach

- Subjectivity classification

- Polarity classification

- In each of the steps, a binary SVM classifier is built to perform the classification.

Preprocessing

- Tweet Normalization

- POS tagging

- Word Stemming

- Syntactic Parsing

Extended Targets

- People express their sentiments about a target by commenting not on the target itself but on some related things of the target.

- One may express a sentiment about a company by commenting on its products or technologies.

- Example:

  "I am passionate about Microsoft technologies especially Silverlight."

Target Dependent Classification

- Syntactic Parse Tree

  - Verb

  - Noun

  - Adjectives

  - Adverbs

  - Negation

- "iPhone works better with the Cell-Band", will generate the feature "arg1_v_well"

Classifying using SVM

- Special binary feature indicating whether or not the tweet contains at least one of the target-dependent features.

- If the feature is present, the entry will be 1; otherwise it will be 0.

- This will be done by using support vector machines.

Tweet Corpus

- No Target dependent Tweet Corpus available

- Build using Twitter search API

- Query using a list of keywords

- Manually classify each tweet as positive, negative or neutral towards the query

- Duplicate Tweets

Query Topics

- Sports
  - Cricket
  - Tennis
  - Football
- Celebrities
  - Sachin
  - Federer
  - Pele
- Sporting Events
  - World Cup
  - Grand Slams
  - Leagues

Accuracy

- Human accuracy – 80%

- Accuracy of Target Independent Classifying algorithms

- Accuracy of Target Dependent Classifying algorithms

- 10 fold cross validation

Results and Representation

- Accuracy of matching

  - Comparison tables
  - Confusion matrices

- Representation

  - <username>

    <keyword 1><sentiment 1>

    <keyword 2><sentiment 2>

    ...

Implementation

- Binary SVM classifier - *http://svmlight.joachims.org/*

- OpenNLP POS tagger - *http://opennlp.sourceforge.net/projects.html*

- Word stemming – word stem mapping table (or) snowball

- Syntactic parsing - MST dependency parser

- Target-independent Features – hashtags, emoticons and sentiment lexicon features (using General Inquirer)

- Extended Targets

- Target dependent features – adjectives, adverbs, noun, verb

- Building a corpus by searching for keywords

- Evaluation and representation

- Hosted at *https://github.com/anirudh24seven/B.Tech-project*

References

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Thank you