

Sentiment Analysis in News Articles Using Sentic Computing

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Background

- ▶ Sentiment analysis for news articles
 - Wide range of applications in business and public policy
 - Especially relevant given the popularity of online media
- ▶ Previous work
 - Machine learning based on n-grams and linguistic features (Wilson et al., 2009)

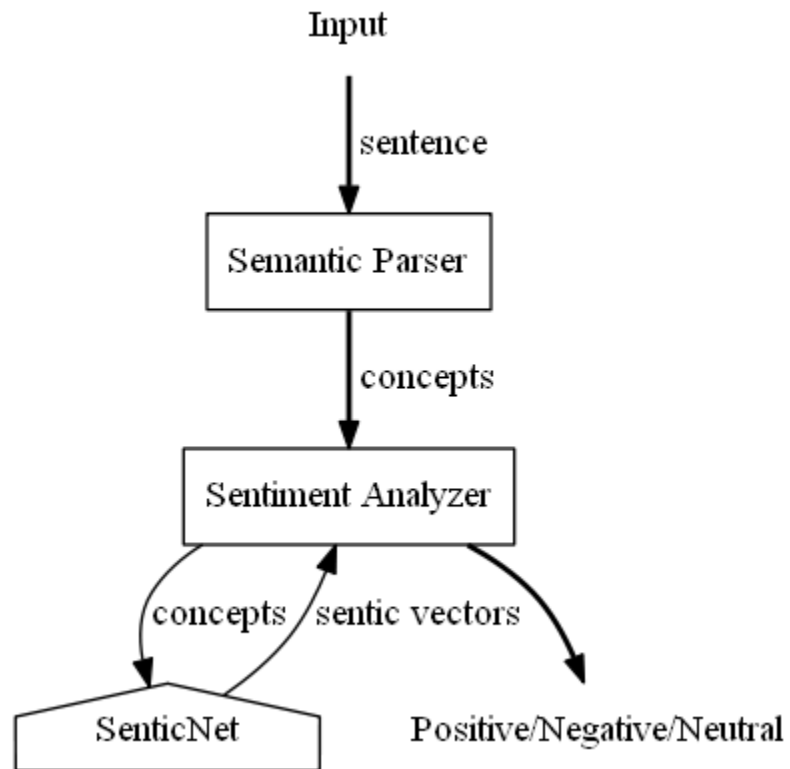
Background

- ▶ News articles are unusually challenging for sentiment analysis
 - They attempt to remain neutral
 - They require knowledge beyond superficial linguistic features
- ▶ We need commonsense knowledge + affective information
 - ➔ Sentic computing (Cambria & Hussain 2012)

A Sentic Approach

- ▶ Associate “sentic vectors” with commonsense concepts from ConceptNet
- ▶ Sentic vector
 - a vector describing a human emotion according to a mathematical model of emotion
- ▶ We designed an opinion mining engine to leverage sentic vectors for sentiment analysis in news articles

Our Engine



Our Engine

▶ Semantic Parser

- Extracts commonsense concepts from sentence
- Uses algorithm inspired by Rajagopal et al. 2013

▶ SenticNet

- Publicly available database of emotions associated with commonsense concepts (Cambria et al. 2012)
- Sentic vector for each concept
- Uses Hourglass of Emotions model:
 - Pleasantness, Attention, Sensitivity, Aptitude

Our Engine

▶ Sentiment Analyzer

- Obtains sentic vector for each extracted concept
- Calculates polarity score for each concept
- Combines polarity scores to give polarity of entire sentences
- Handles negation

Test Data

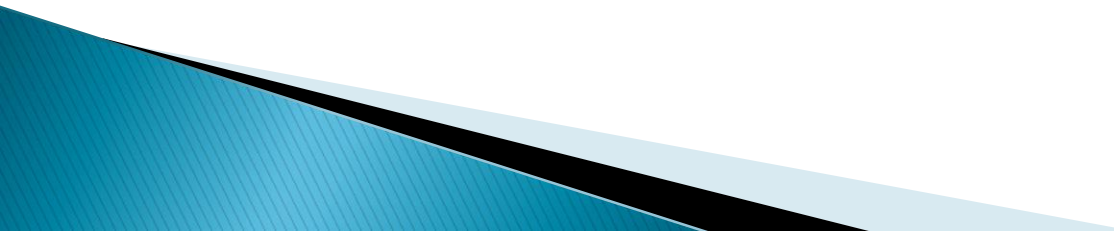
- ▶ 3,181 sentences from the MPQA corpus (Wilson 2008)
 - Taken from large collection of world news articles
- ▶ Grouped into positive, negative and neutral classes using annotations from the corpus

Results

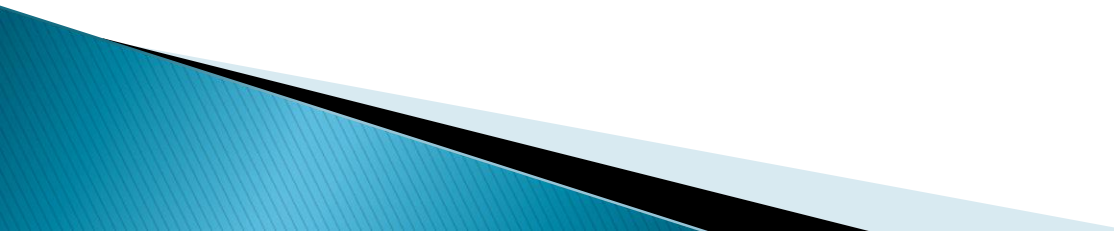
- Accuracy: 71.2%

Class	Precision	Recall	F-measure
Positive	46.3%	79.3%	58.5%
Negative	61.6%	70.5%	65.8%
Neutral	90.9%	69.8%	79.0%

Conclusions

- ▶ Reasonably high accuracy, given the difficulty of the problem
 - ▶ Accurate identification of neutral sentences
 - ▶ Able to catch most positive or negative sentences
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Future Work

- ▶ Improve semantic parser
 - Use transformational grammar
 - ▶ Identify target of emotion
 - Starting point: sentiment pattern method (Yi et al. 2003)
 - ▶ Anaphora resolution
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