SemEval-2013 Task 2: Sentiment Analysis in Twitter

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Task 2 - Overview

Sentiment Analysis
- Understanding how opinions and sentiments are expressed in language
- Extracting opinions and sentiments from human language data

Social Media
- Short messages
- Informal language
- Creative spelling, punctuation, words, and word use
- Genre-specific terminology (#hashtags) and discourse (RT)

Task Goal: Promote sentiment analysis research in Social Media

SemEval Tweet Corpus
- Publically available (within Twitter TOS)
- Phrase and message-level sentiment
- Tweets and SMS\(^1\) for evaluating generalizability

\(^1\) From NUS SMS Corpus (Chen and Kan, 2012)
Task Description

Two subtasks:
A. Phrase-level sentiment
B. Message-level sentiment

Classify as positive, negative, neutral/objective:
– Words and phrases identified as subjective [Subtask A]
– Messages (tweets/SMS) [Subtask B]
Data Collection

Extract NEs (Ritter et al., 2011)

Identify Popular Topics (Ritter et al., 2012)
- NEs frequently associated with specific dates

Extract Messages Mentioning Topics

Filter Messages for Sentiment
- Keep if ≥ pos/neg term from SentiWordNet (>0.3)

Data for Annotation
Annotation Task

Mechanical Turk HIT (3-5 workers per tweet)

Instructions: Subjective words are ones which convey an opinion. Given a sentence, identify whether it is objective, positive, negative, or neutral. Then, identify each subjective word or phrase in the context of the sentence and mark the position of its start and end in the text boxes below. The number above each word indicates its position. The word/phrase will be generated in the adjacent textbox so that you can confirm that you chose the correct range. Choose the polarity of the word or phrase by selecting one of the radio buttons: positive, negative, or neutral. If a sentence is not subjective please select the checkbox indicating that "There are no subjective words/phrases". Please read the examples and invalid responses before beginning if this is your first time answering this hit.

Sentence: friday¹ evening² plans³ were⁴ great,⁵ but⁶ saturday’s⁷ plans⁸ didn’t⁹ go¹⁰ as¹¹ expected¹² --¹³ i¹⁴ went¹⁵ dancing¹⁶ &¹⁷ it¹⁸ was¹⁹ an²⁰ ok²¹ club,²² but²³ "terribly"²⁴ crowded²⁵ :-(²⁶

Overall, the sentence is  Objective  Positive  Negative  Neutral

☐ There are no subjective words/phrases.

Subjective Phrase 1:  5 to  5  great,  Positive  Negative  Neutral
Subjective Phrase 2:  9 to  12  didn’t go as expected  Positive  Negative  Neutral
Subjective Phrase 3:  to  
Subjective Phrase 4:  to  
add more phrases >>
## Data Annotations

<table>
<thead>
<tr>
<th>Worker 1</th>
<th>I would love to watch Vampire Diaries tonight :) and some Heroes! Great combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worker 2</td>
<td>I would love to watch Vampire Diaries tonight :) and some Heroes! Great combination</td>
</tr>
<tr>
<td>Worker 3</td>
<td>I would love to watch Vampire Diaries tonight :) and some Heroes! Great combination</td>
</tr>
<tr>
<td>Worker 4</td>
<td>I would love to watch Vampire Diaries tonight :) and some Heroes! Great combination</td>
</tr>
<tr>
<td>Worker 5</td>
<td>I would love to watch Vampire Diaries tonight :) and some Heroes! Great combination</td>
</tr>
<tr>
<td><strong>Intersection</strong></td>
<td>I would <strong>love</strong> to watch Vampire Diaries tonight :) and some Heroes! <strong>Great</strong> combination</td>
</tr>
</tbody>
</table>
## Distribution of Classes

### Subtask A

<table>
<thead>
<tr>
<th></th>
<th>Train</th>
<th>Dev</th>
<th>Test-TWEET</th>
<th>Test-SMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>5,895</td>
<td>648</td>
<td>2,734 (60%)</td>
<td>1,071 (46%)</td>
</tr>
<tr>
<td>Negative</td>
<td>3,131</td>
<td>430</td>
<td>1,541 (33%)</td>
<td>1,104 (47%)</td>
</tr>
<tr>
<td>Neutral</td>
<td>471</td>
<td>57</td>
<td>160 (3%)</td>
<td>159 (7%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>4,635</td>
<td>2,334</td>
</tr>
</tbody>
</table>

### Subtask B

<table>
<thead>
<tr>
<th></th>
<th>Train</th>
<th>Dev</th>
<th>Test-TWEET</th>
<th>Test-SMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>3,662</td>
<td>575</td>
<td>1,573 (41%)</td>
<td>492 (23%)</td>
</tr>
<tr>
<td>Negative</td>
<td>1,466</td>
<td>340</td>
<td>601 (16%)</td>
<td>394 (19%)</td>
</tr>
<tr>
<td>Neutral/O</td>
<td>4,600</td>
<td>739</td>
<td>1,640 (43%)</td>
<td>1,208 (58%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>3,814</td>
<td>2,094</td>
</tr>
</tbody>
</table>
Options for Participation

1. **Subtask A** and/or **Subtask B**

2. **Constrained*** and/or **Unconstrained**
   - Refers to data used for training

3. **Tweets** and/or **SMS**

* Used for ranking
Participation

Teams (44)

SubTask A (23)
- Constrained (21)
- Unconstrained (7)

SubTask B (38)
- Constrained (36)
- Unconstrained (15)

Submissions (148)
Scoring

• Recall, Precision, F-measure calculated for pos/neg classes for each run submitted

Score = Ave(Pos F, Neg F)
Subtask A (words/phrases) Results

Tweets

<table>
<thead>
<tr>
<th>System</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRC-Canada</td>
<td></td>
</tr>
<tr>
<td>AVAYA</td>
<td></td>
</tr>
<tr>
<td>Bounce</td>
<td></td>
</tr>
</tbody>
</table>

SMS

<table>
<thead>
<tr>
<th>System</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>GU-MLT-LT</td>
<td></td>
</tr>
<tr>
<td>NRC-Canada</td>
<td></td>
</tr>
<tr>
<td>AVAYA</td>
<td></td>
</tr>
</tbody>
</table>
Subtask B (messages) Results

Tweets

SMS

Top Systems
1. NRC-Canada
2. GU-MLT-LT
3. teragram

Top Systems
1. NRC-Canada
2. GU-MLT-LT
3. KLUE
Observations

Majority of systems were supervised and constrained
  • 5 semi-supervised, 1 fully unsupervised

Systems that made best use of unconstrained option:
  • **Subtask A**: senti.ue-en
  • **Subtask B Tweet**: AVAYA, bwbaugh, ECNUCS, OPTIMA, sinai
  • **Subtask B SMS**: bwbaugh, nlp.cs.aueb.gr, OPTIMA, SZTE-NLP

Most popular classifiers
  • SVM, MaxEnt, linear classifier, Naive Bayes
Thank You!

Special thanks to co-organizers:
Preslav Nakov, Sara Rosenthal, Alan Ritter
Zonitsa Kozareva, Veselin Stoyanov

SemEval Tweet Corpus

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  • JHU Human Language Technology Center of Excellence
  • ODNI IARPA