Agree or Disagree: Predicting Judgments on Nuanced Assertions

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One of the most basic reactions when reading a sentence is to agree or disagree with it.*

*You are probably thinking about whether you agree with that assertion right now.
Assertions

• explicit expressions of opinions, beliefs, claims, arguments, and points of view about a controversial issue; e.g.:
  • A vegetarian diet is healthy and beneficial over a meat based diet.
  • It is possible to kill animals in a manner that is humane.

• mean to describe one’s position on an controversial issue (e.g. gun rights, veganism)
Prediction of Judgments of Individuals

- **given**: judgments on a set of assertions of a **person**
  - e.g. Donald Trumps likes/dislikes on posts

- **predict**: judgment of that **person** on a new assertion
  - e.g. Would he agree to “Mueller is a fraud”?
Prediction of Judgments of Groups

- **given**: judgments on a set of assertions of a **group**
  - e.g. thumbs up/thumbs down of Volkswagen customers on YouTube comments

- **predict**: judgment of that group on a new assertion
  - e.g. What percentage would agree to “VW should be compensating its customers”?
Dataset of **Nuanced Assertions on Controversial Issues (NAoCI)**

- 16 issues
- >2000 assertions
- >100,000 judgments
- >200 persons

Our Approach

1. Automatically predict the degree to which assertions are judged similarly (Judgment Similarity) based on Text

2. Predict judgment on new assertions based on most similar seen assertion
Our Approach – Example

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A vegetarian diet is healthy and beneficial over a meat based diet.

Living a vegan lifestyle makes you look good.

It is possible to kill animals in a manner that is humane.

Vegetarians have a reduced risk of suffering from serious illnesses.
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Judgment Similarity vs. Text Similarity

A vegetarian diet is healthy and beneficial over a meat based diet.  
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• several reasons why assertions are judged similarly
  • text similarity
  • paraphrases
  • entailment
  • underlying socio-cultural, political, or personal factors

• new judgment similarity measures needed
Judgment Similarity

- degree to which two assertions are similarly judged by a large number of people
- cosine between judgment vectors (gold)
- needs to be estimated from the text (>11,000 pairs per issue)
Predicting Judgment Similarity – SVM

Feature Extraction
- ngrams
- word polarity
- negations

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tokenization

Text of Assertion 1

Text of Assertion 2
Predicting Judgment Similarity – Siamese Neural Network

- Text of Assertion 1
- Text of Assertion 2

- tokenization

- dense(50)
- dense(100)
- max pooling
- convolution
- embedding

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- cosine
Predicting Judgment Similarity – Results

- Longest Common Substring
- Greedy String Tiling
- Jaccard
- Embedding Distance (fasttext)
- SVM
- SNN

Correlation

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0

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Error Analysis

(a) SVM
(b) SNN
Prediction of Judgments of Individuals – Results

<table>
<thead>
<tr>
<th>Baselines</th>
<th>Judgment Similarity</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>random</td>
<td>SVM</td>
<td>mean other</td>
</tr>
<tr>
<td>all agree</td>
<td>SNN</td>
<td>most similar assertion</td>
</tr>
<tr>
<td>tendency</td>
<td></td>
<td>most similar person</td>
</tr>
</tbody>
</table>
Prediction of Judgments of Groups – Results

- SVM: Direct Prediction
- CNN: Judgment Similarity SVM
- n=1, n=18
- n=1, n=34
- n=1, n=7
- Judgment Similarity SNN
- Judgment Similarity Gold

Correlation

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Conclusion

- new task: predicting agreement
  - for individuals
  - for groups
- our approach: make prediction based on most similar seen assertion (judgment similarity)
- for individuals: hard task with strong baselines
- for groups: promising results for SNN
- data: https://sites.google.com/view/you-on-issues/
- code: https://github.com/muchafel/judgmentPrediction