Automatic Detection of Point of View Differences in Wikipedia

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Outline

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Point of view

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Discussion

Future work

Point of view

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- ▶ Objective statements could be positive or negative.
  - ▶ Barack Obama was named the 2009 Nobel Peace Prize laureate. Positive
  - ▶ Edward Theodore confessed to killing two women. Negative
- ▶ Some *objective* articles give the reader a positive/negative impression about their subject matter.

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- ▶ The background could impact the written document in two ways:
    - ▶ there are always many different non-equivalent ways of conveying a given piece of information, some more positive, some more negative.
    - ▶ the selection of what information to present (positive vs negative).

Example for POV difference: Fritz Haber

Fritz Haber: Different objective descriptions of same fact

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- English Wikipedia: "has been described as the father of chemical warfare. "
- French Wikipedia: "considered the father of chemical arms. "
- Spanish Wikipedia: "has been described as the father of chemical warfare. "
- German Wikipedia: "made him the father of chemical arms. "
- Russian Wikipedia: "Haber is called the father of chemical arms. "

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- ▶ German Wikipedia: "made him the father of chemical arms. "
- ▶ Russian Wikipedia: "Haber is called the father of chemical arms. "
- ▶ Italian Wikipedia: " convinced the German [military leadership] to use poison gas . . . "

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Fritz Haber: Different selections of facts

- ▶ English Wikipedia: "The food base of half of the current world population is based on the Haber-Bosch process."
- ▶ French Wikipedia: no quantitative assessment of impact of Haber-Bosch on worldwide food production.

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▶ Our work tries to answer empirically some social science research questions such as:
Are all relevant POVs equally represented?
How favorably are the objects perceived?
Do different groups of people view a certain object differently in a systematic fashion?

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- ▶ We cast the problem of assessing POVs as a relative problem.
- ▶ We call the difference between two objectively written documents, where one is describing the subject matter in a more positive/negative way than the other, a point of view difference.
- ▶ Our work aims to detect POV differences automatically.

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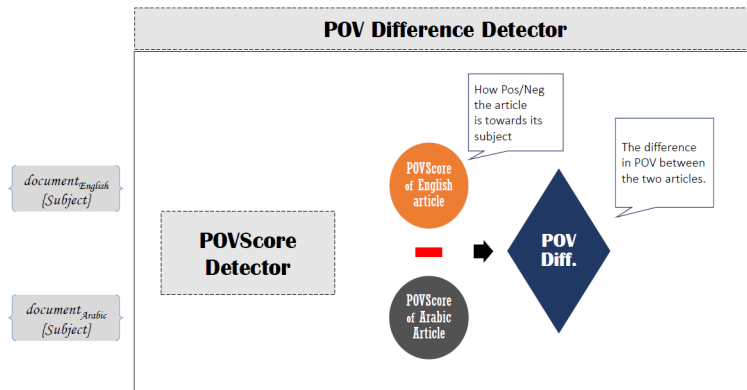
Approach

Overview

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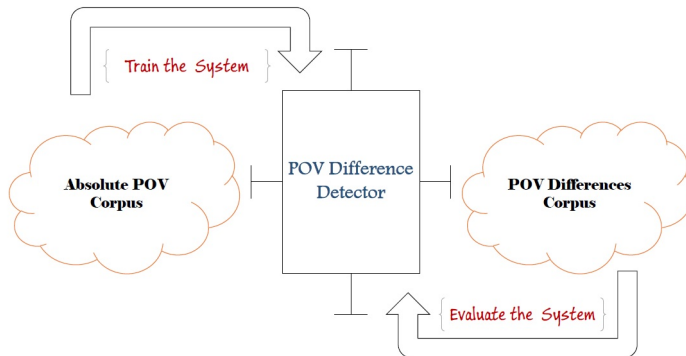
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- ▶ We use Amazon Mechanical Turk (AMT) to annotate the corpus.

Absolute POV corpus
The interface of AMT experiment

The Task

The Target: Ariel Sharon

The Paragraph

After retiring from the army, Sharon had joined the Likud party, and served in a number of ministerial posts in Likud-led governments in 1977-92 and 1996-99. He became the leader of the Likud in 2000, and served as Israels Prime Minister from 2001 to 2006. In 1983 the commission established by the Israeli Government found that as Minister of Defense during the 1982 Lebanon War Sharon bore "personal responsibility" for the massacre by Lebanese militias of Palestinian civilians in the refugee camps of Sabra and Shatila, for his having disregarded the prospect of acts of bloodshed by the Phalangists against the population of the refugee camps, and not having prevented their entry. The Kahan Commission recommended Sharon's removal as Defense Minister, and Sharon did resign after his initial refusal to do so. In the 1970s, 1980s, and 1990s, Sharon championed construction of Israeli settlements in the West Bank and Gaza Strip.

Positive [   ]
Negative [   ]
Neutral   [   ]

[Submit]

Absolute POV corpus: Agreement

▶ We assign a sentence to the class chosen by at least two of
  the three annotators.

	Arabic	English
agreement − all workers	.30	.48
agreement − majority of workers	.90	.95
Fleiss' κ	.215	.419

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- ▶ We selected 30 pairs of articles from 4 different categories.
- ▶ Annotators were asked to compare each pair of articles based on the articles' POV toward its subject.

POV differences corpus

Annotation setup and example of a completed annotation for POV differences.

Target: Michael Faraday

Q1. The attitude of the English article toward the target compared to the Arabic article is:
1. Much more positive
2. More positive
3. Equal
4. More negative **X**
5. Much more negative

Q2. Briefly justify your answer to question 1.
Both articles have a very positive attitude towards Faraday but I sensed it more in the Arabic one. For example in the marriage section of the Arabic article compared with the English one, the attitude was much more positive and it mentioned that he was a loved, devoted, humble person which isn't mentioned in the English article. Also the controversy with Davy was only mentioned in the English article not the Arabic one. The Arabic article didn't mention anything negative towards Faraday.

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- ▶ We map the five point rating scale to $[-2, -1, 0, 1, 2]$,
- ▶ The gold standard score Δ_{POV}^{g} for a pair of articles is the average of the three scores given by the annotators.

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Approach

Overview

POV Difference Detector

How Pos/Neg the article is towards its subject

POVScore of English article

The difference in POV between the two articles.

$document_{English}$ [Subject]

POVScore Detector

POV Diff.

$document_{Arabic}$ [Subject]

POVScore of Arabic Article
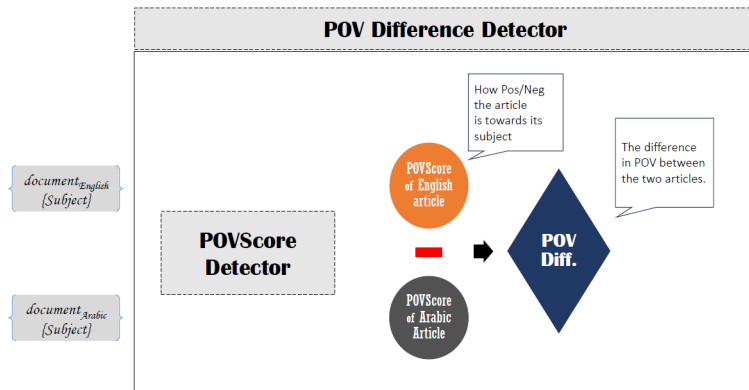
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Absolute POV score
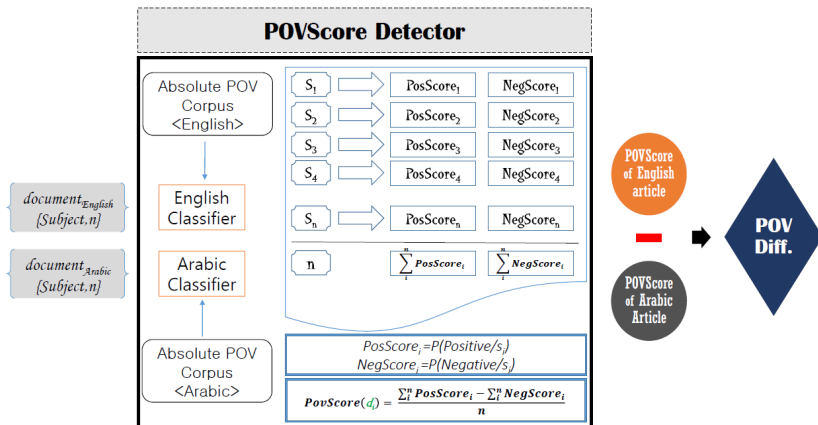
POVScore Detector

$document_{English}$ [Subject, n]

$document_{Arabic}$ [Subject, n]

Absolute POV Corpus <English>

English Classifier

Arabic Classifier

Absolute POV Corpus <Arabic>

S_1	$PosScore_1$	$NegScore_1$
S_2	$PosScore_2$	$NegScore_2$
S_3	$PosScore_3$	$NegScore_3$
S_4	$PosScore_4$	$NegScore_4$
S_n	$PosScore_n$	$NegScore_n$
n	$\sum_i^n PosScore_i$	$\sum_i^n NegScore_i$

$$PosScore_i = P(Positive/s_i)$$
$$NegScore_i = P(Negative/s_i)$$

$$PovScore(d_i) = \frac{\sum_i^n PosScore_i - \sum_i^n NegScore_i}{n}$$

POVScore of English article

POVScore of Arabic Article

POV Diff.

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Absolute POV classification

		Arabic		English	
		acc	F_1	acc	F_1
	baseline	.437	.206	.478	.214
BOW	tokens	.569†	.447†	.587†	.506†
	roots	.555†	.464†		
	stems	.561†	.460†		
n-grams	tokens	.574†	.453†	**.608†**	**.533†**
	roots	.580†	.470†		
	stems	**.584†**	**.474†**		

Table: Accuracy (acc) and F_1 of absolute POV classification. BOW = bag of words. †: significantly better than the baseline ($p < .01$).

Actual vs. predicted POV differences
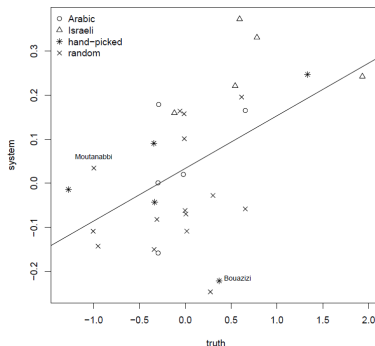
Figure: Estimated POV difference Δ_{POV} as a function of true POV difference Δ_{POV}^g. The different symbols are used to show the category of each gold standard pair.

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Examples of POV differences

▶ We extracted some patterns of persons that are evaluated
differently in English and Arabic Wikipedias.

	POVScore		
personality	English	Arabic	Δ_{POV}
Baruch Goldstein	.244	-.199	.443
Tzipi Livni	.549	.009	.540
Ariel Sharon	.259	-.113	.372
Wael Ghonim	.398	.528	-.130
Gamal Abdel Nasser	.296	.389	-.093
Saladin	.201	.320	-.119
Michael Jackson	.475	.617	-.142
Maria Sharapova	.579	.683	-.104
Steven Spielberg	.570	.744	-.174

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- ▶ Some sentences have POV reversers.
  - ▶ e.g. John started a war on violence against women.

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- ▶ We present an automatic method for detecting POV differences.

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Concept-based POV detection

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  - For s2: The classifier? I dont now!! I will try to guess! Maybe it is Neutral!!!

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    - The Classifier: The two sentences are equally Negative!!!

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  - ▶ Relation degree: Strong,...
    - ▶ Frequency of concept, position ...

Hitler Concepts-network
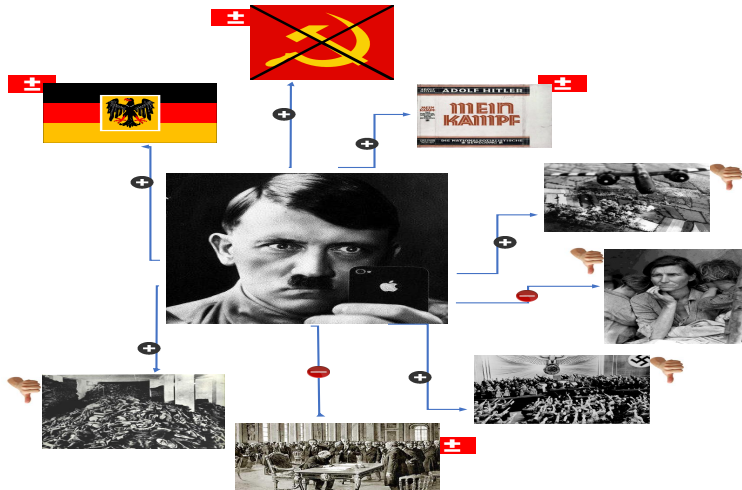
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- ▶ The correlation between the Arabic-opinion poll list and the list that are ranked by A-POVscore is -0.03!!

Thank You