An Overview of Opinionated Tasks and Corpus Preparation

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What is an opinion?

- Opinion is a subjective information
- Opinion usually contains an opinion holder, an attitude, and a target, but not obligatory
- A sentential clause or a meaningful unit (in Chinese) is the smallest unit of an opinion.

Why opinion processing is important?

- There is explosive information on the Internet, and it's hard to extract opinions by humans.
- Opinions of the public is an important index of companies and the government.
- Opinions change over time, so to keep track of opinions automatically is an important issue.

Opinionated Applications

- Sentiment word mining
- Opinionated sentence extraction
- Opinionated document extraction
- Opinion summarization
- Opinion tracking
- Opinionated question answering
- Multi-lingual/Cross-lingual opinionated issues

Fact-based vs. Opinion-based

Examples:

- Circular vs. Happy
- He is an engineer. vs. He thinks that his boss is a kind person.
- Why the sky is blue? vs. Do people support the government?

Previous Work (1)

- English:
  - Sentiment words
    (Wiebe et al., Kim and Hovy, Takamura et al.)
  - Opinion sentence extraction
    (Riloff and Wiebe, Kim and Hovy)
  - Opinion document extraction
    (Wiebe et al., Pang et al.)
  - Opinion summarization: reviews and products
    (Hu and Liu, Dave et al.)

Previous Work (2)

- Japanese
  - Opinion extraction
    (Kobayasi et al.: reviews, at word/sentence level)
  - Opinion summarization
    (Morinaga et al.: product reputations,
     Seki, Eguchi, and Kando)
- Chinese
  - Opinion extraction (Ku, Wu, Li and Chen)
  - Opinion summarization (Ku, Li, Wu and Chen)
  - News and Blog Corpora (Ku, Liang and Chen)
- Korean?

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Corpus Preparation (1)

- Quantity
  - How much materials should we collect?
    - Words/Sentences/Documents
- Source
  - What source should we pick? Mining opinions from general documents or the obvious opinionated documents? (ex. Discussion group)
  - News, Reviews, Blogs, …

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Corpus Preparation (2)

- Different granularity
  - Word level
  - Sentence level
  - Clause level
  - Document level
  - Multi-documents (summarization)
- Different sources
- Different languages

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Previous Work
(Corpus Preparation 1)

- Example: NRRC Summer Workshop on Multiple-Perspective QA
  - People involved: 1 researcher, 3 graduate students, 6 professors
  - Collect 270,000 documents, over 11-month periods, retrieve documents relevant to 8 topics, more than 200 documents of each topic

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Previous Work
(Corpus Preparation 2)

- Source: news documents
  (World News Connection - WNC)

8 Topics	
The presidential election in Zimbabwe	Passage of the Kyoto Protocol
The U.S. annual human rights report	The political upheaval in Venezuela
Relation between Taiwan and China	Israeli settlements in the West Bank
The U.S. holding of al Quaida and Taliban detainees at Guantanamo Bay	Reactions to the U.S. characterization of certain countries as an "axis of evil."

- In another work on word level: 2,615 words

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Previous Work
(Corpus Preparation 3)

- Example: Using NTCIR Corpus (Chinese)
  - Reusable
  - NTCIR2, news documents
  - Retrieve documents relevant to 6 topics
  - On average, 34 documents for each topic
  - At Word level: 838 words
  - Experiments using NTCIR3 are ongoing

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Previous Work
(Corpus Preparation 4)

6 topics		
Topic ID	Topic Title	Doc #
ZH021	Civil ID Card	37
ZH024	The Abolishment of Joint College Entrance Examination	55
ZH026	The Chinese-English Phonetic Transcription System	37
ZH027	Anti-Meinung Dam Construction	15
ZH028	Hewing Down of Chinese Junipers in Chilan	23
ZH036	Surrogate Mother	37

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Previous Work
(Corpus Preparation 5)

- Example: Using reviews from Web (Japanese)
  - Specific domains: cars and games
  - 15,000 reviews (230,000 sentences) for cars, 9,700 reviews (90,000 sentences) for games
  - Using topic words (ex. Companies of cars and games)
  - Semi-automatic methods for collecting opinion terms (with patterns)

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Corpus Annotation

- Annotation types (1)
  - Support/Non-support
  - Sentiment/Non-sentiment
  - Positive/Neutral/Negative
  - Strong/Medium/Weak
- Annotation types (2)
  - Opinion holder/Attitude/Target
  - Nested opinions

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Previous Work
(Corpus Annotation 1)

- Example: NRRC Summer Workshop on Multiple-Perspective QA (English)
  - Total 114 documents annotated
  - 57 with deep annotations, 57 with shallow annotations
  - 7 annotators

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Previous Work
(Corpus Annotation 2)

- Tags
  - Opinion: on=implicit/formally declared/…
  - Fact: onlyfactive=yes/no
  - Subjectivity: strength=high/medium/low
  - Attitude: neg-attitude/pos-attitude
  - Writer: opinion holder information

Previous Work
(Corpus Annotation 3)

- Example: Using NTCIR Corpus (Chinese)
  - Total 204 documents are annotated
  - 3 annotators
  - Using XML-style tags
  - Define types, but no strength (considering the agreement issue)

Previous Work
(Corpus Annotation 4)

Tag			
Level	Attribute	Value	Description
<DOC_ATTITUDE></DOC_ATTITUDE>			
Document	TYPE	POS NEG NEU	Document Attitude: Define the opinion polarity of the whole document
<SEN_ATTITUDE></SEN_ATTITUDE>			
Sentence	TYPE	SUP NSP NEU	Sentence Attitude: Define the opinion polarity of one sentence
<OPINION_SEG></OPINION_SEG>			
Sub-sentence	TYPE	PSV	Opinion Segment: Define the scope of one opinion
<OPINION_SRC></OPINION_SRC>			
Sub-sentence	TYPE	EXP IMP	Opinion Source: Define the opinion holder of a specific opinion
<SENTIMENT_KW></ SENTIMENT_KW >			
Word	TYPE	POS NEG NEU	Sentiment Keyword: Define the opinion polarity of a single word
<OPINION_OPR></OPINION_OPR>			
Word	TYPE	PSV	Opinion Operator: Define the keyword of expressing an opinion

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Corpus Evaluation (1)

- How to choose materials?
  - Filter out candidates whose annotations are too diverse among annotators? (Agreements?)
  - How many annotators are needed for one candidate? (More annotators, lower agreements)
  - How to build the gold standard?
    - Voting
    - Use instances with consistent annotations

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Corpus Evaluation (2)

- How to evaluate a corpus for a subjective task?
  - Agreement (Is it enough?)
  - Kappa value (To what agreement level ?)
    - Almost perfect agreement
    - Substantial agreement
    - Moderate agreement
    - Fair agreement
    - Slight agreement
    - Less than change agreement

Previous Work
Corpus Evaluation

- Different languages/annotations may have different agreements.
  - Kappa: 0.32-0.65 (onlyfactivity, English)
  - Kappa: 0.40-0.68 (word level, Chinese)
- Different annotators with different background may have different agreements.

What are needed for this work?

- What kind of documents? News? Others?
- All relevant documents?
- Provide only the type of documents, or fully annotated documents for training?
- Provide some sentiment words as clues?
- To what granularity? Word, clause, sentence, document, or multi-document?
- In which language? Mono-lingual, multi-lingual or cross-lingual?

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Any comments are welcome

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