



# Building an Argument Search Engine for the Web

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# Einleitung

An argument search framework

An argument search index

A prototype argument search engine

# Framework

- generic framework for the main tasks of the search engine (indexing, retrieval)

## **in particular:**

Indexing: acquisition of document candidates, mining, assessing the arguments, indexing

Retrieval: formulation of the search query, retrieving and ranking the arguments, presenting the results

# Arguments

- argument model: Argument (consisting of Conclusion + Premise + Stance) and argument context
- current model at the time had trouble if arguments supported or conflicted with each other

# Acquisition

crawling of document candidates, output in HTML

# Mining

extracting arguments from the candidates (via Apache UIMA),  
in a way that enables other researchers to participate

# Assessment

Is the page likely to be spam? ,  
ranking the reputation of the page, calculating the  
relevance to the query

# Indexing

via Apache Lucene, conclusion and premises with the  
highest priority

# Retrieval

- input is interpreted as words and phrases, certain queries need to be preprocessed
- retrieval separate from ranking due to more complex issues (correcting spelling errors, detecting synonyms), UIMA used for analysis of arguments
- uses both standard and alternate methods for ranking, exact placement of arguments still a work in progress
- both visual and textual presentations possible (text snippets, coloring pro and con individually)

# Crawling

## **Argument model**

- Many different models of argumentation exist
- Common ground used: premises (reasons) either supporting (pro) or attacking (con) a conclusion (claim)

## **Extracting Data**

- Argument mining approaches lack robustness!
- > Structure of (five) specific online debate portals is mapped to the used argument model

# Crawling

## Noise reduction

- Remove premises with unclear stance
- Remove questions as conclusions
- Remove empty premises/conclusions
- Remove duplicates
- Remaining problems: phrases specific to the website the argument was retrieved from

## Result

- Largest argument resource to that point (as known to the authors)



# args - The Argument Search Engine

Querying

Retrieval

Ranking

Presentation

AND Query

Exact Matches

Okapi BM25

Pro vs. Con View

The conclusions match with 41.6% - 84.6% of all queries

Page 1 of 659 arguments, 335 pro, 324 con (retrieved in 877.3ms)

Pro vs. Con View | Overall Ranking View

Pro

Feminism Has NO gender. I am a Man And I am A...

<http://www.debate.org/debates/Feminism/1/>

**Feminism** Has NO gender. I am a Man And I am A Feminist. **Feminism** by definition stands up for all my perspectives, ambitions, desires and behaviours. **Feminism** is the ACT of ... ▼ score

Feminism is definitely something that there needs...

<http://www.debate.org/debates/Feminism/12/>

**Feminism** is definitely something that there needs to be more of in the world. Feminists just want ... not like **feminism**. **Feminism** is about equality, nothing else. ... ▼ score

Many women are against feminism because they like...

<http://www.debate.org/debates/Feminism/12/>

Many women are against **feminism** because they like the traditional roles of women, like cooking, cleaning, taking care of the kids. **Feminism** is not about demolishing that idea, it is ... ▼ score

Con

Do American women still need feminism? A...

<http://www.debate.org/debates/Feminism/12/>

Do American women still need **feminism**? A controversial social media movement called Women Against **Feminism** features women explaining "mostly in "selfies" with handwritten signs " why ... ▼ score

Feminism says they want the equality but the...

<http://www.debate.org/debates/Feminism/12/>

**Feminism** says they want the equality but the definition of the **Feminism** doesn't say anything about ... single way. so modern **Feminism** is not about equality It's about Female ... ▼ score

Women don't need feminism. They are highly capable...

<http://www.debate.org/debates/Feminism/12/>

Women don't need **feminism**. They are highly capable of taking care of themselves, but you know who ... are mistreated and not respected. Women do not need modern **Feminism**. They do want ... ▼ score

# Conclusion

## Framework

- large index of arguments



## Retrieval problems

- learning to rank
- user modeling
- search result personalization



## Ethical issues

- bias
- one-side consideration of the problem