Bachelor's thesis defense:
Integrating counterarguments into args.me

Philipp Rudloff   June 11th, 2019

1. referee: Prof. Dr. Benno Stein
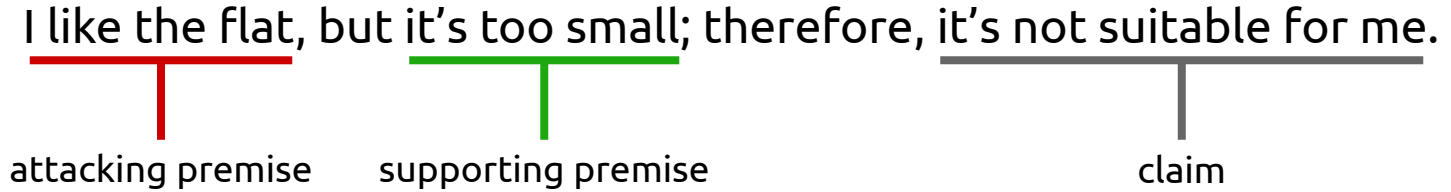2. referee: Jun.-Prof. Dr. Florian Echtler

What is args?

- An argument search framework for studying questions revolving around computational argumentation

- A prototypical argument search engine

- Presented 2017 in "Building an Argument Search Engine for the Web"

  Henning Wachsmuth, Martin Potthast, Khalid Al-Khatib, Yamen Ajjour, Jana Puschmann, Jiani Qu, Jonas Dorsch, Viorel Morari, Janek Bevendorff, and Benno Stein. Building an Argument Search Engine for the Web. In *Fourth Workshop on Argument Mining (ArgMining 2017)*, pages 49–59, September 2017. Association for Computational Linguistics.

What is an argument?

- A claim and a set of premises which either support or attack the claim

I like the flat, but it's too small; therefore, it's not suitable for me.

attacking premise   supporting premise   claim

What is a counterargument?

- An argument countering another argument:
    - it either denies the other argument's claim
    - or it attacks the relationship between the other argument's claim and its supporting premises

Ice is slippery because pressure lowers the ice's melting point so it becomes water.

claim   supporting premise

Goals

- Integrate counterarguments into the args framework and search engine based on "Retrieval of the Best Counterargument without Prior Topic Knowledge"

  Henning Wachsmuth, Shahbaz Syed, and Benno Stein. Retrieval of the Best Counterargument without Prior Topic Knowledge. In *56th Annual Meeting of the Association for Computational Linguistics (ACL 2018)*, pages 241–251, July 2018. Association for Computational Linguistics.

- Improve args.me's layout

- Perform a user study on the new prototype(s) for args.me

Web service prerequisites

Looking into the development process of a Webis service

Web service prerequisites

- High fluctuation of participants working on software in the Webis group

- Results:

  - Wide variety of used tools and programming languages
  - Increased difficulty in project maintenance
  - Higher barrier of entry for new researchers and developers

- Reaction: Standardize the development process

Project structure

- A Webis service is concerned with many things

- Various services share similarities in structure

- Separate concerns by splitting the service into well-defined components

- Expectations:

    - Reduce risk of breaking unrelated aspects of a service when changing another
    - Less interference when working multiple teams work on the same service
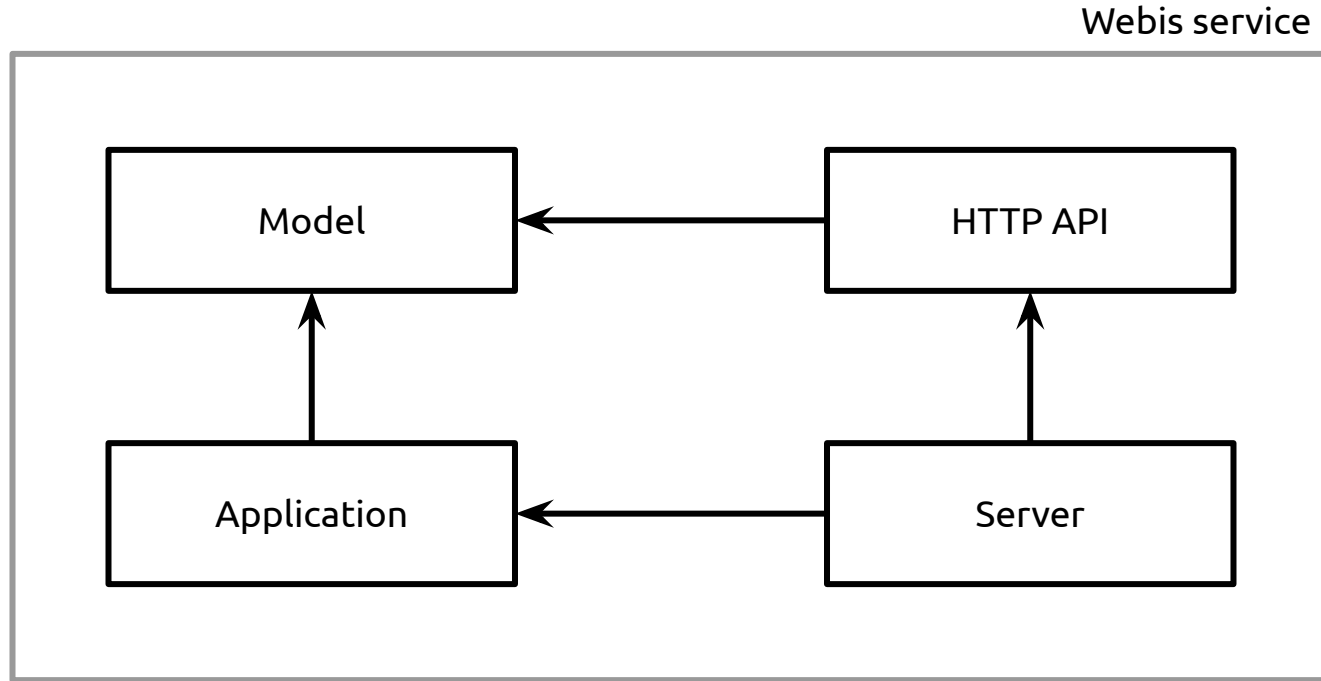   - Potential for re-using common components

Project structure

Webis service
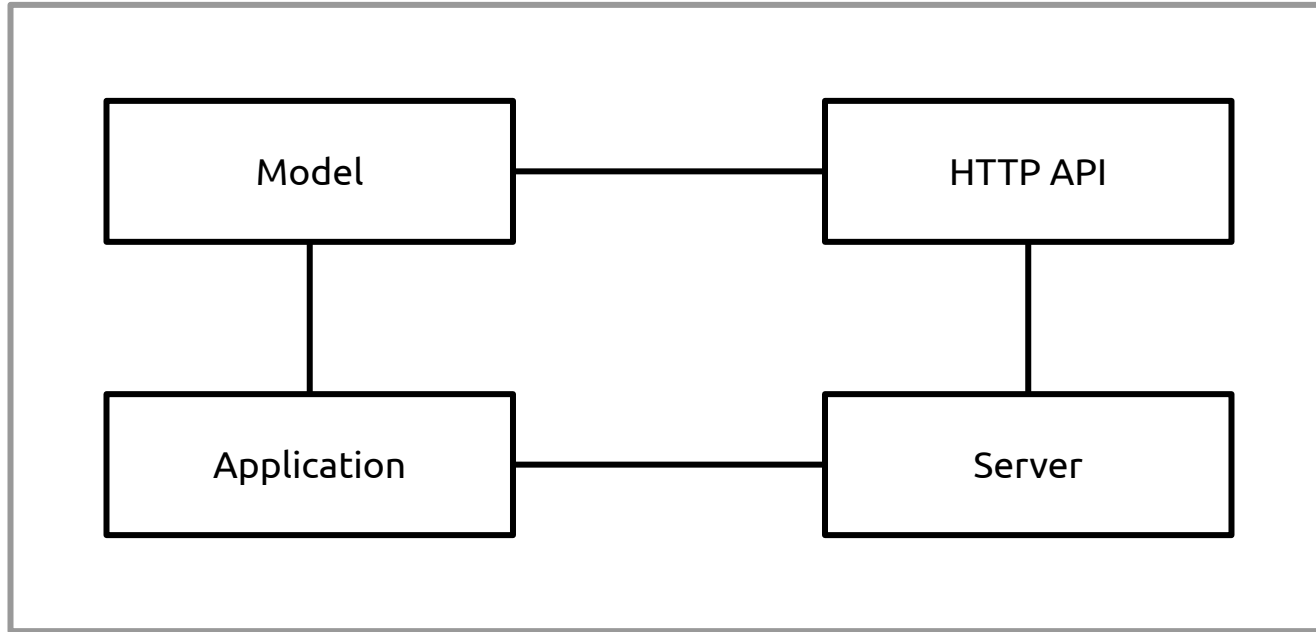
Project structure

Technologies

- Greatest common denominator approach

- Improve maintainability and learnability by using fundamental technologies

- Code produced for this thesis uses standard HTML, CSS, and JavaScript

Use cases & features

Use cases

- Give reason for new features

- Are there scenarios with requirements that exceed args' current capabilities?

Use case scenarios

- Look at argumentation from the perspective of different categories: Researching, convincing, opinion-forming, decision-making

- Example scenario: Convincing

  - In order to convince someone of a different opinion, presenting counterarguments seems essential

Example scenario: Convincing

Argument:

Gravity doesn't affect light because gravity is based on mass and light has no mass.

claim

Counterargument:

Gravity affects light because gravity is based on energy and momentum which light has.

claim

Features

- Argument search

  - The core of an argument search engine
  - Exploration of a shallow argument space

- Argument-counterargument relation

  - A useful addition to tasks revolving around argumentation
  - Exploration of the argument space in a more meaningful way

Searching in args' argument space

query

Index:

argument ID premises conclusion …	**argument** ID premises conclusion …	**argument** ID premises conclusion …	**argument** ID premises conclusion …	…
match	no match	match	match	
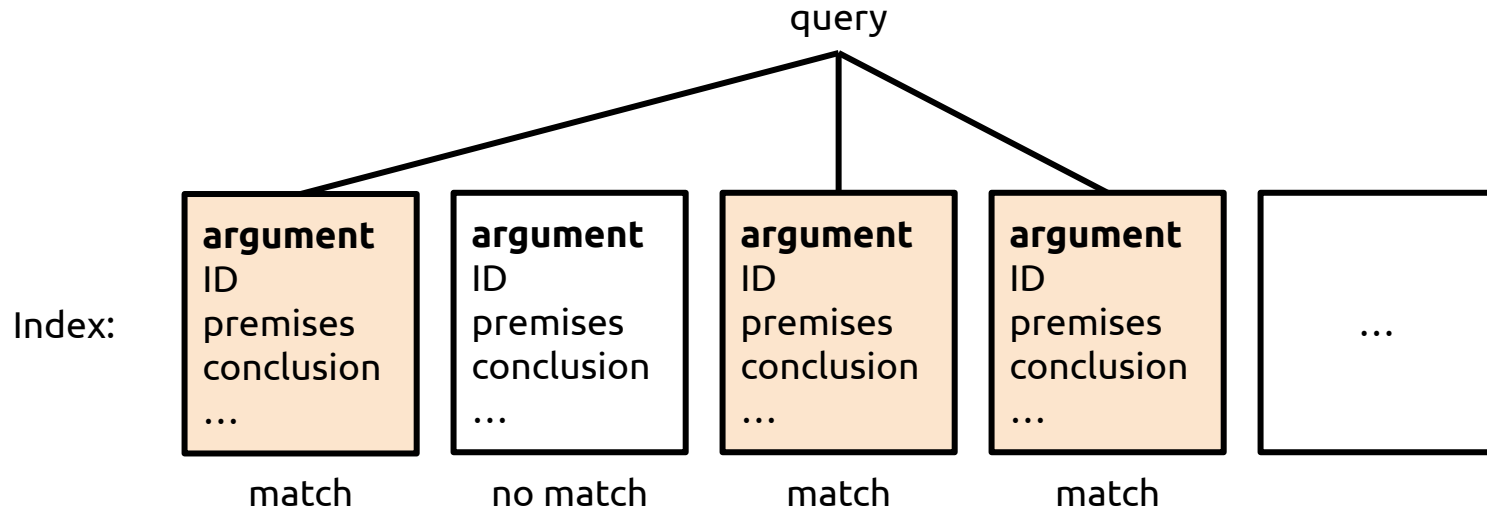
Exploring argument-counterargument relations

argument
ID
premises
conclusion
…
counterarguments

Counterarguments:

argument
ID
premises
conclusion
…
counterarguments

argument
ID
premises
conclusion
…
counterarguments

argument
ID
premises
conclusion
…
counterarguments

Searching in args' argument space

query

| Index: | argument | argument | argument | argument | ... |

Counterarguments:

| argument | argument | argument |

Counterarguments:
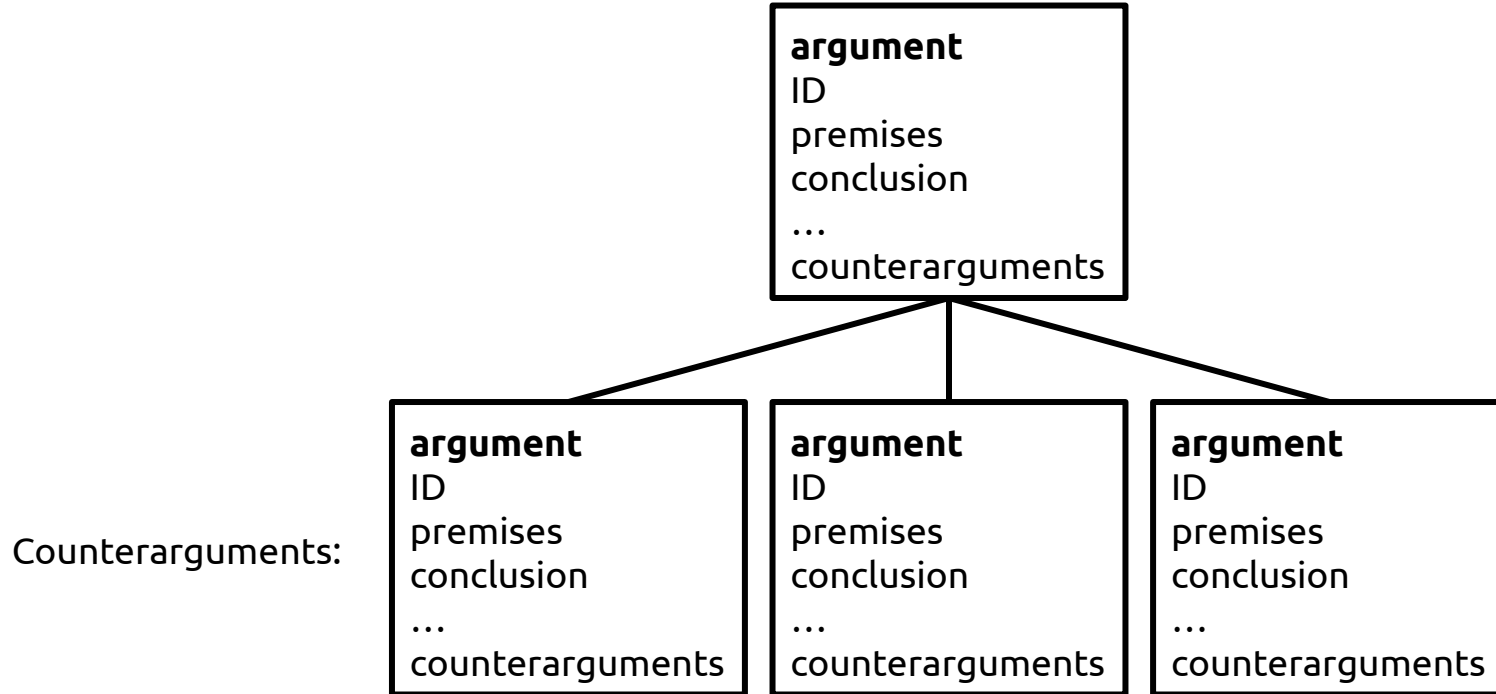
| argument | argument |
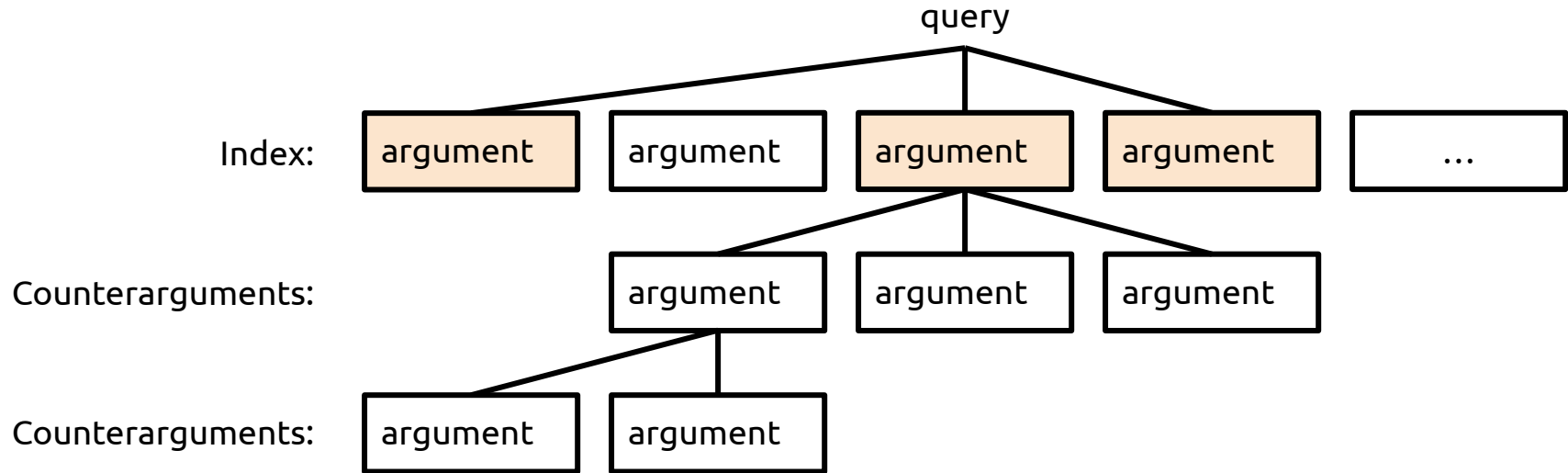
Prototypes

Prototypes

- The initial state of args.me and apparent issues with its usability were documented

- In total, five prototypes were developed with these goals:

  - Implement the previously defined new features
  - Solve the documented layout and accessibility issues
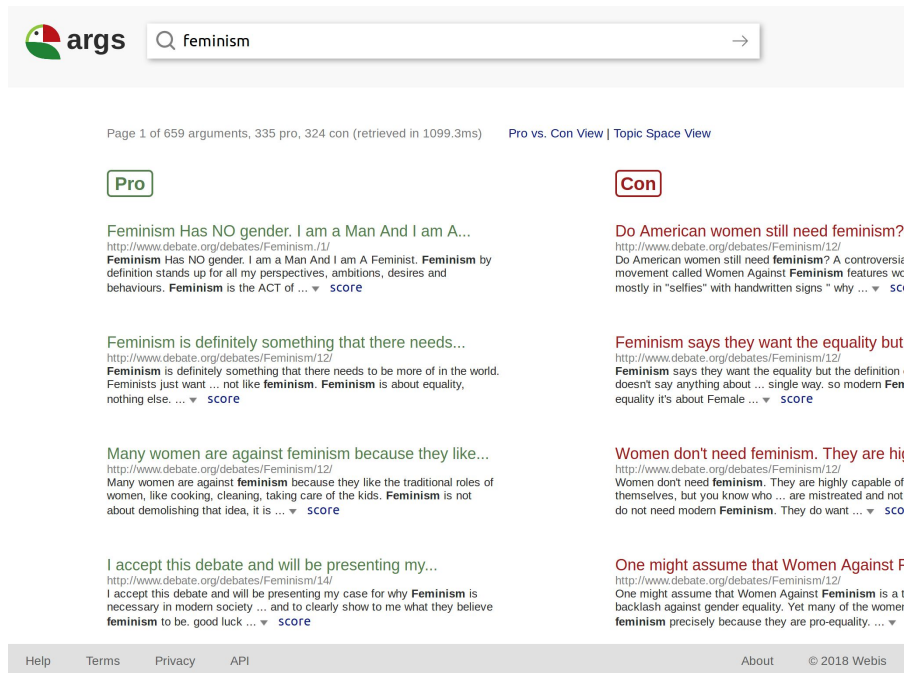
The initial state of args.me

- Args.me allows its users to search for arguments by entering a free-text query

- The argument search results are displayed in a pro vs. con view:
  A two-column view with two lists of arguments according to their stance

- Additionally, the results can be viewed in a topic space visualization

Yamen Ajjour, Henning Wachsmuth, Dora Kiesel, Patrick Riehmann, Fan Fan, Giuliano Castiglia, Rosemary Adejoh, Bernd Fröhlich, and Benno Stein. Visualization of the Topic Space of Argument Search Results in args.me. In *2018 Conference on Empirical Methods in Natural Language Processing (EMNLP 2018) – System Demonstrations*, pages 60–65, November 2018. Association for Computational Linguistics.

Layout issues

- The argument search results page does not have a responsive layout

- On small to medium-sized screens, content overflows the viewport on both axis

Pro

Con

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

Do American women still need feminism?
http://www.debate.org/debates/Feminism/12/
Do American women still need **feminism**? A controversia movement called Women Against **Feminism** features wo mostly in "selfies" with handwritten signs " why ... ▾ sco

Feminism is definitely something that there needs...
http://www.debate.org/debates/Feminism/12/
Feminism is definitely something that there needs to b Feminists just want ... not like **feminism**. **Feminism** is nothing else. ... ▾ score

Feminism says they want the equality but
http://www.debate.org/debates/Feminism/12/
y want the equality but the definition about ... single way. so modern Fen male ... ▾ score

Many women are against feminism beca
http://www.debate.org/debates/Feminism/12/
Many women are against **feminism** because they like t women, like cooking, cleaning, taking care of the kids. about demolishing that idea, it is ... ▾ score

eed feminism. They are hig
g/debates/Feminism/12/
eminism. They are highly capable of know who ... are mistreated and not do not need modern **Feminism**. They do want ... ▾ sco

I accept this debate and will be presenting my...
http://www.debate.org/debates/Feminism/14/
I accept this debate and will be presenting my case for why **Feminism** is necessary in modern society ... and to clearly show to me what they believe **feminism** to be. good luck ... ▾ score

One might assume that Women Against F
http://www.debate.org/debates/Feminism/12/
One might assume that Women Against **Feminism** is a t backlash against gender equality. Yet many of the womer **feminism** precisely because they are pro-equality. ... ▾

You claim that feminism encourages false rape...
http://www.debate.org/debates/Feminism/5/
You claim that **feminism** encourages false rape accusations and stereotyping men as bad. Um... No. that's not what **feminism** is at all. **Feminism** is the

Feminism is a threat to society. Feminism
http://www.debate.org/debates/Feminism/5/
Feminism is a threat to society. **Feminism** encourages accusations and stereotyping men as bad. I'm not saying

Content overflowing on both the vertical and horizontal axis.

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Accessibility issues

- Args.me has a generally poor keyboard and screen reader accessibility on its argument search results pages

- In particular, the full content of an argument cannot be accessed by either keyboard or screen reader users

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Not keyboard-accessible, does not communicate interactivity

Prototype 1

- One-column layout as the new default view for argument search results

- Counterargument previews were added to the first result

args — feminism

Arguments 1–10 of 659 (335 pro, 324 contra; retrieved in 813.6ms)   Traditional view | Topic space view

Feminism Has NO gender. I am a Man And I am A...   `pro`
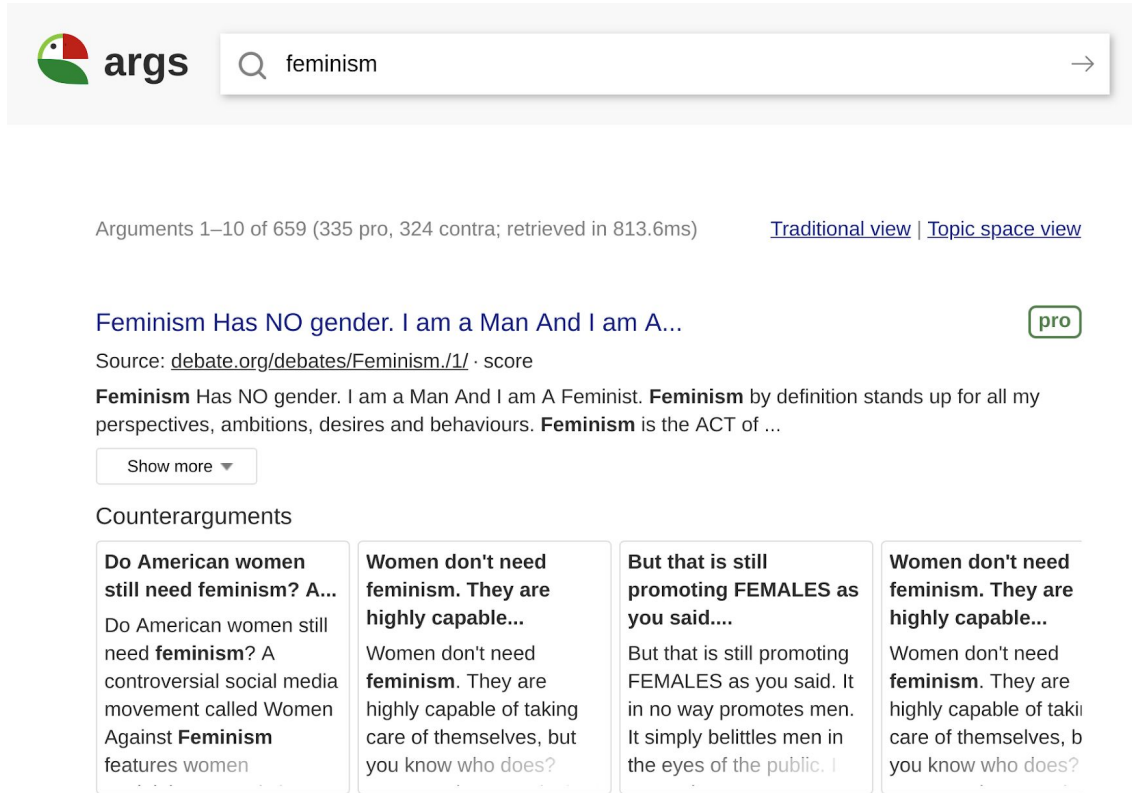Source: debate.org/debates/Feminism./1/ · score

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 ...

Show more ▼

Counterarguments

Do American women still need feminism? A...	**Women don't need feminism. They are highly capable...**	**But that is still promoting FEMALES as you said....**	**Women don't need feminism. They are highly capable...**
Do American women still need **feminism**? A controversial social media movement called Women Against **Feminism** features women	Women don't need **feminism**. They are highly capable of taking care of themselves, but you know who does?	But that is still promoting FEMALES as you said. It in no way promotes men. It simply belittles men in the eyes of the public. I	Women don't need **feminism**. They are highly capable of takii care of themselves, b you know who does?

Prototype 2

- Counterargument previews were added to all results

- Previews are now initially hidden

args

Q feminism →

Arguments 1–10 of 659 (335 pro, 324 contra; retrieved in 813.6ms)   Traditional view | Topic space view

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

pro · Source: debate.org/debates/Feminism./1/ · score

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 ...

Show more ▼

Show counterarguments

Do American women still need feminism? A...

contra · Source: debate.org/debates/Feminism/12/ · score

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 ...

Show more ▼

Show counterarguments

Prototype 3

- Re-ordered elements to emphasize their importance

- Removed argument title

args   feminism

Arguments 1–10 of 659 (retrieved in 813.6ms)   Topic space view

Stance: **pro**   Supported conclusion: Feminism.

▶ Show all

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 …

Source: debate.org/debates/Feminism./1/   ⎥⎮⎿ Score

▶ Show counterarguments

Stance: **contra**   Attacked conclusion: Feminism

▶ Show all

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 …

Source: debate.org/debates/Feminism/12/   ⎥⎮⎿ Score

▶ Show counterarguments

Comparison: Arguments in prototypes 2 & 3

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

pro · Source: debate.org/debates/Feminism./1/ · score

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 ...

Show more ▾

Show counterarguments

Comparison: Arguments in prototype 2 & 3

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

pro · Source: debate.org/debates/Feminism./1/ · score

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 ...

Show more ▼

Show counterarguments

Stance: **pro**   Supported conclusion: Feminism.

▶ Show all

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 …

Source: debate.org/debates/Feminism./1/   ᛁ�818 Score

▶ Show counterarguments

Prototype 4

- A drop-down menu for switching between views was added

- Updated the detail pages for counterarguments so that they visually match arguments in the search results

args

feminism 🔍

Arguments 1–10 of 659 (retrieved in 813.6ms)

Switch view

Stance: **pro** Supported conclusion: Feminism.

▶ Show full argument

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 …

Source: debate.org/debates/Feminism./1/ Score

▶ Show counterarguments

Stance: **con** Attacked conclusion: Feminism

▶ Show full argument

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 …

Source: debate.org/debates/Feminism/12/ Score

▶ Show counterarguments

Prototype 5

- Incorporated expert feedback regarding the overall use of space and the order of elements

args   feminism

Arguments 1–10 of 659 (retrieved in 813.6ms)   Switch view ▾

pro Feminism Has NO gender. I am a Man And I am A Feminist. …
▸ Show full argument
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 …

debate.org/debates/Feminism./1/ ᴵᴵᴵ score
▸ Show counterarguments

con Do American women still need feminism? A controversial …
▸ Show full argument
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 …

debate.org/debates/Feminism/12/ ᴵᴵᴵ score
▸ Show counterarguments

pro Feminism is definitely something that there needs to be …
▸ Show full argument
Feminism is definitely something that there needs to be more of in the world. Feminists just want …

debate.org/debates/Feminism/12/ ᴵᴵᴵ score
▸ Show counterarguments

Prototype 5: Demo

Achieved goals

- Integrated counterarguments into args.me

- Made args.me's layout responsive

- Reviewed some aspects of args.me with the Web Content Accessibility Guidelines 2.1 (w3.org/TR/WCAG21)

- Proposed a foundation for streamlining the development process within the Webis group

Future work

- **Improve counterarguments integration**

    - Allow access to full counterarguments directly on an argument search results page

- **Explore integration of related claims**

    - When entering a query, args matches its with claim on the index
    - Args could then present related conclusions

Thank you for your time

Related work

2017

- Henning Wachsmuth, Martin Potthast, Khalid Al-Khatib, Yamen Ajjour, Jana Puschmann, Jiani Qu, Jonas Dorsch, Viorel Morari, Janek Bevendorff, and Benno Stein. **Building an Argument Search Engine for the Web**. In *Fourth Workshop on Argument Mining (ArgMining 2017)*, pages 49–59, September 2017. Association for Computational Linguistics.

2018

- Henning Wachsmuth, Shahbaz Syed, and Benno Stein. **Retrieval of the Best Counterargument without Prior Topic Knowledge**. In *56th Annual Meeting of the Association for Computational Linguistics (ACL 2018)*, pages 241–251, July 2018. Association for Computational Linguistics.

- Yamen Ajjour, Henning Wachsmuth, Dora Kiesel, Patrick Riehmann, Fan Fan, Giuliano Castiglia, Rosemary Adejoh, Bernd Fröhlich, and Benno Stein. **Visualization of the Topic Space of Argument Search Results in args.me**. In *2018 Conference on Empirical Methods in Natural Language Processing (EMNLP 2018) – System Demonstrations*, pages 60–65, November 2018. Association for Computational Linguistics.