Computational Argumentation at Webis

Winter term 2018

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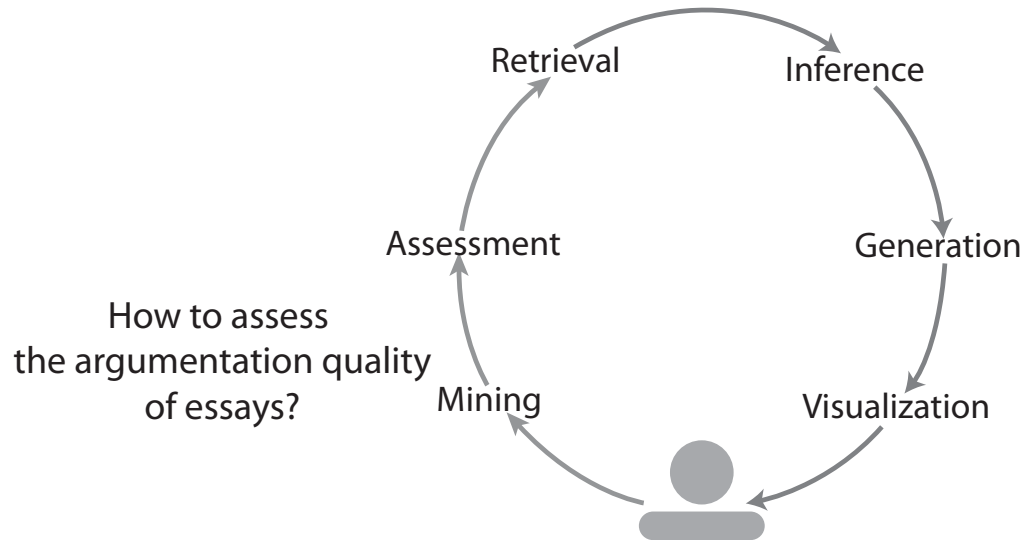
Web Technology & Information Systems
Bauhaus-Universität Weimar
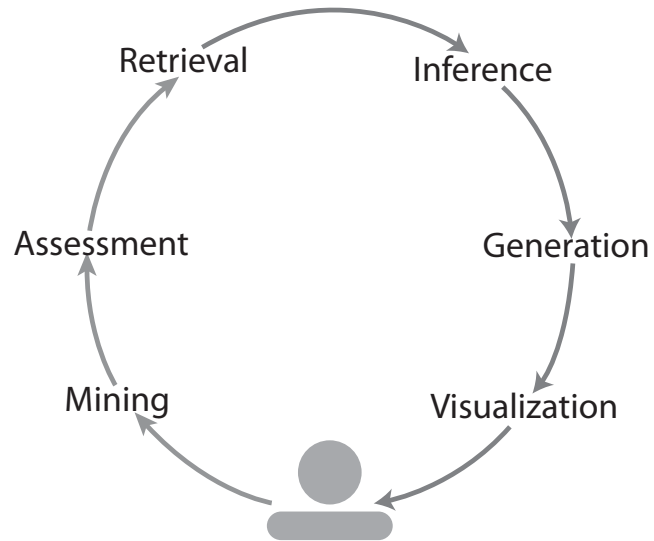
Computational Argumentation at Webis

Overview

Computational Argumentation at Webis

Overview

Retrieval

Inference

Assessment

Generation

How to assess
the argumentation quality
of essays?

Mining

Visualization

Computational Argumentation at Webis

Essay Scoring

Essay scoring task: given a prompt and an essay written against it how to automatically assess the quality of the essay ?

Prompt: Using computer daily can have more negative than positive effects on your children? do you agree or disagree?
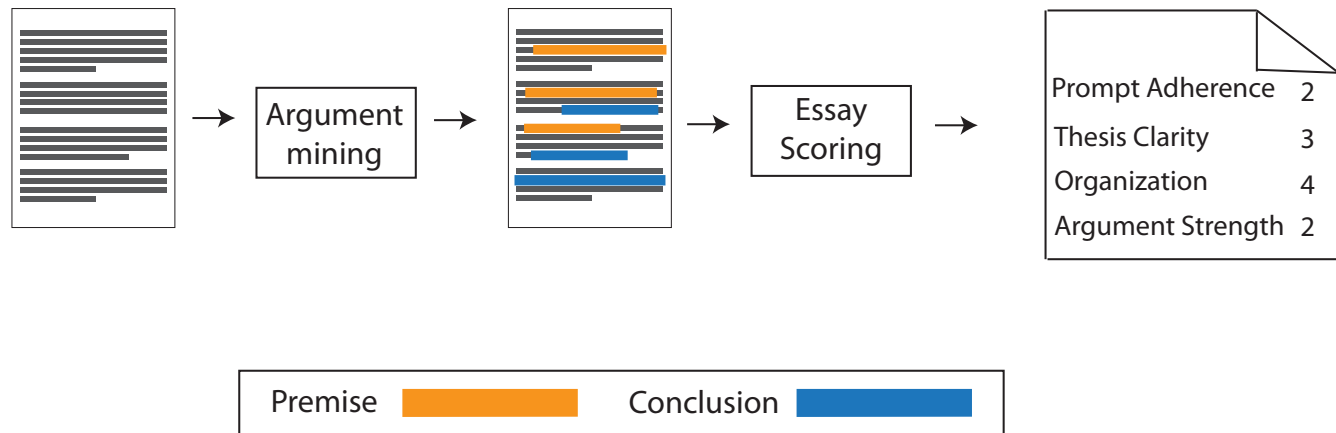
Quality dimensions:

- ❏ Prompt Adherence
- ❏ Organization
- ❏ Thesis Clarity
- ❏ Argument Strength
- ❏ ..

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Argument mining for essay scoring

How to use the output of argument mining for essay scoring ?

Premise ▬▬▬ (orange)   Conclusion ▬▬▬ (blue)

Prompt Adherence	2
Thesis Clarity	3
Organization	4
Argument Strength	2

Contributions

- ❑ State-of-the-art approaches for scoring the organization and argument strength of an essay

Argument mining for essay scoring

Essay scoring demo

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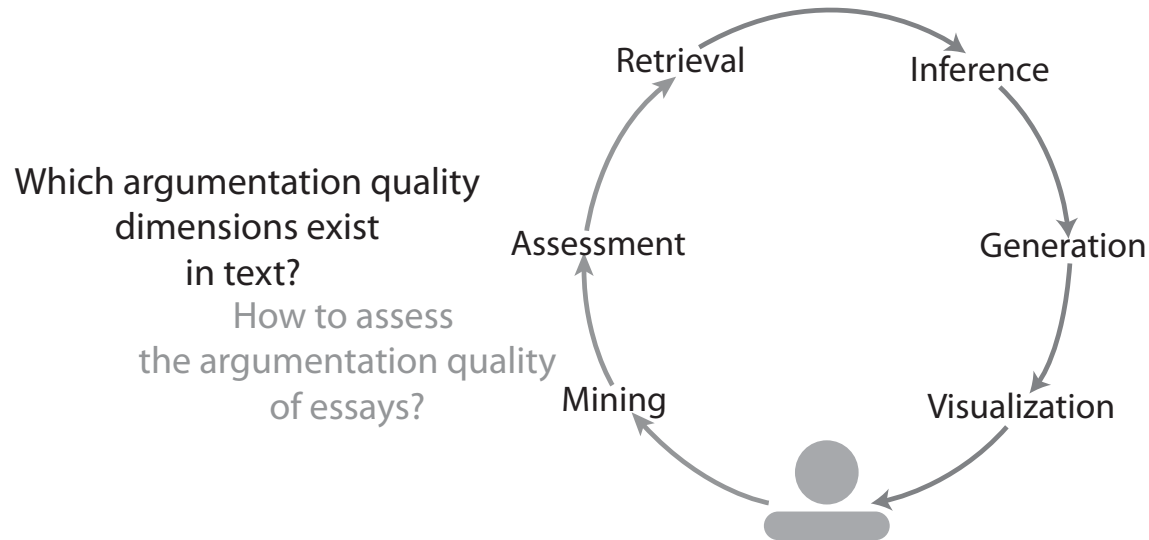
Overview

Which argumentation quality
dimensions exist
in text?

How to assess
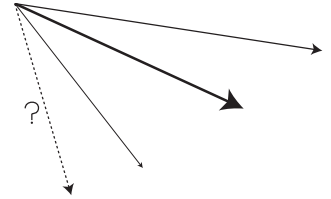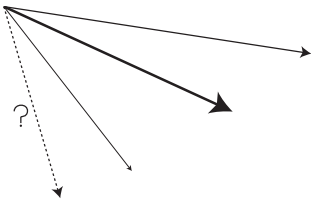the argumentation quality
of essays?

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Argumentation Quality in Natural Text

Which quality dimensions are there for argumentation in natural text ?

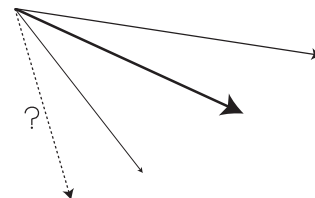How do these dimensions relate to each other ?

Computational Argumentation at Webis

Argumentation Quality in Natural Text

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How do these dimensions relate to each other ?

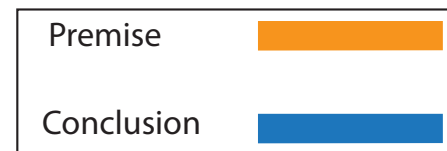Which level of granularity are these dimensions associated with ?

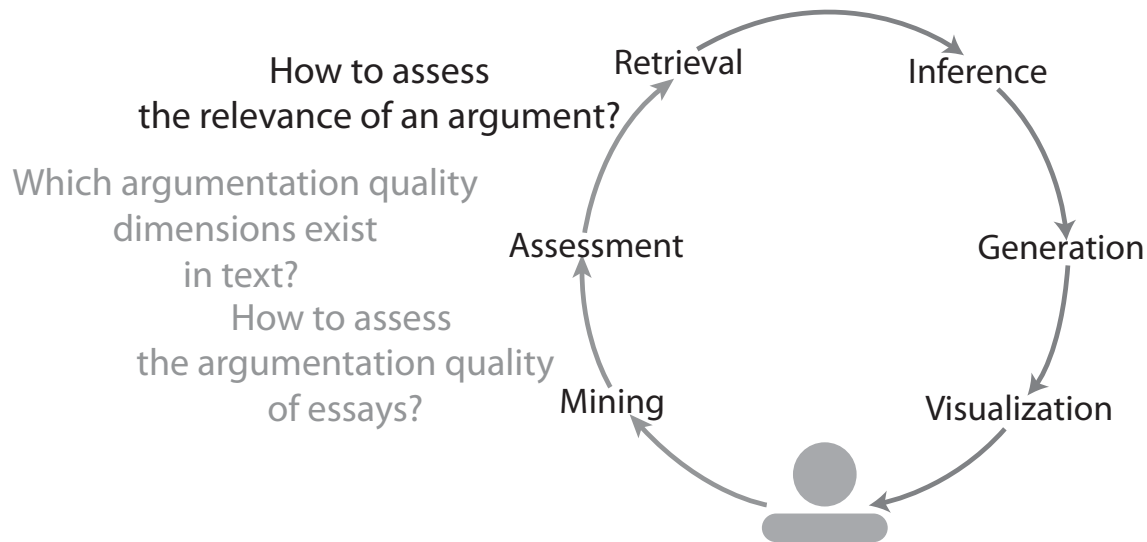Argumentation Granularity   Argument Granularity   Argument Unit Granularity

Premise

Conclusion

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Argumentation Quality in Natural Text

Which quality dimensions are there for argumentation in natural text ?

How do these dimensions relate to each other ?

Which level of granularity are these dimensions associated with ?

| Argumentation Granularity | Argument Granularity | Argument Unit Granularity |

Contributions

- ❑ Comprehensive survey of argumentation quality dimension
- ❑ Holistic taxonomy of quality dimensions and their relations
- ❑ Annotated corpus for computational argumentation quality

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Overview

How to assess
the relevance of an argument?

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Retrieval → Inference → Generation → Visualization → Mining → Assessment → Retrieval
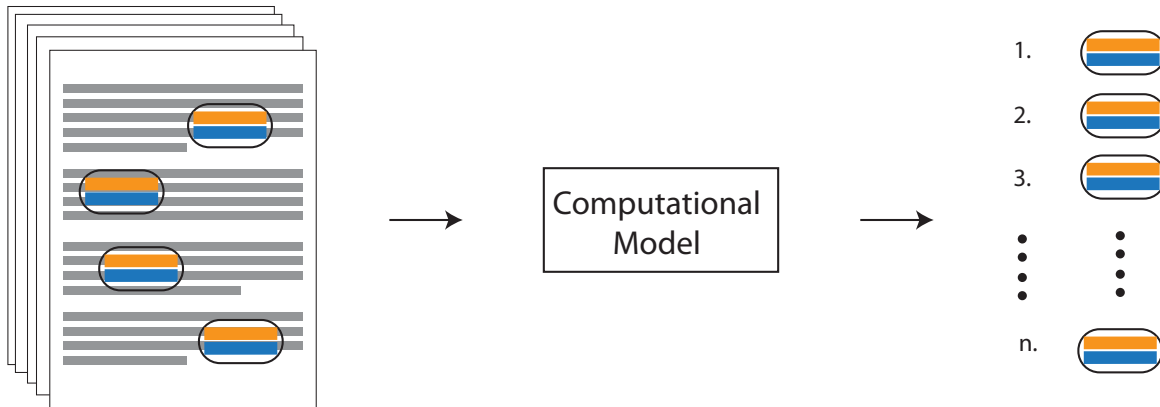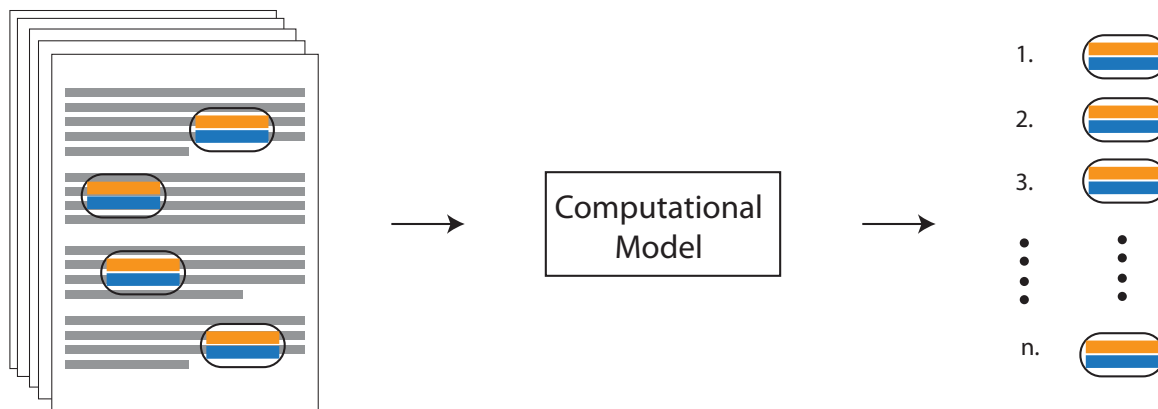
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Argument Relevance Assessment

Argument relevance is one dimension of argument quality and measures the contribution an argument makes in resolving a debate.

Computational Argumentation at Webis

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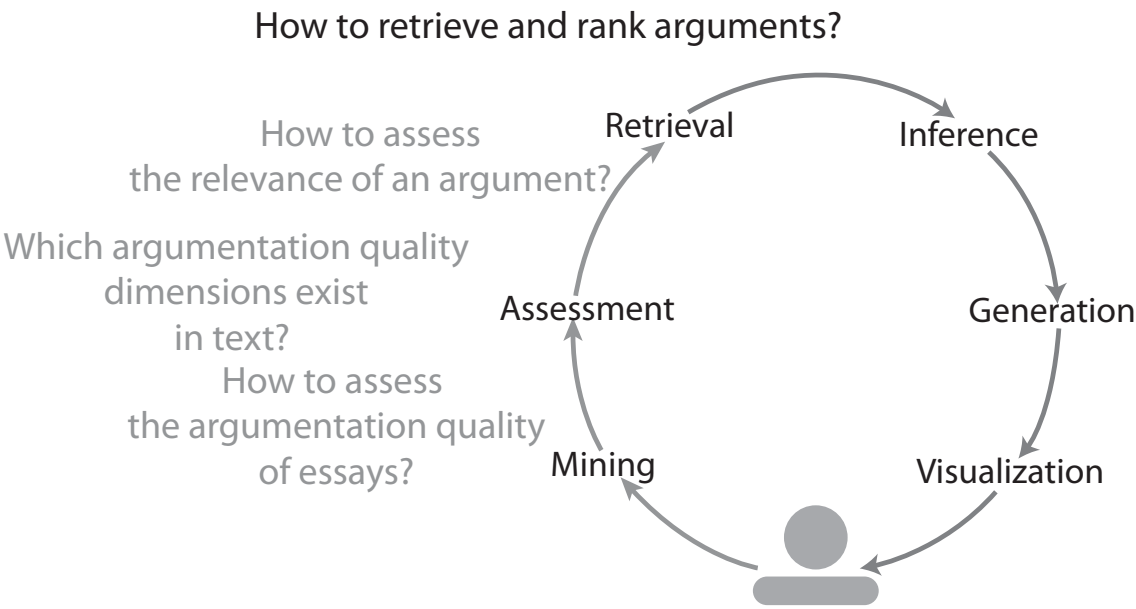How to computationally assess argument relevance ?

Computational Argumentation at Webis

Argument Relevance Assessment

Argument relevance is one dimension of argument quality and measures the contribution an argument makes in resolving a debate.

How to computationally assess argument relevance ?

Contributions

- ❏ Computational model to assess argument relevance objectively
- ❏ Benchmark ranking dataset for argument relevance

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How to retrieve and rank arguments?

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Argument Search Engine

Argument search engine retrieves the best arguments which support or attack a given query
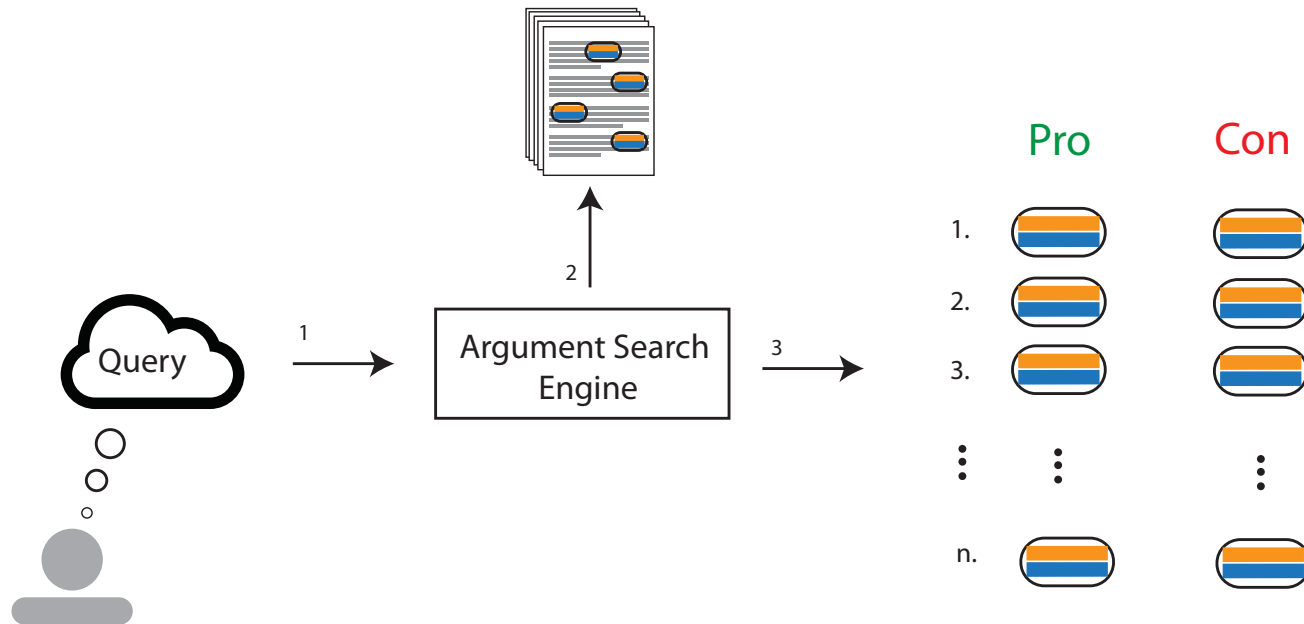
Argument search engine demo

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Challenges in argument search

Query identification and comprehension

❑ How to find whether a query requires an argument?
Examples: **banning burqa** , **earth is round**

❑ How to retrieve relevant arguments to the query?

❑ How to find whether an argument is for or against the query ?

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Argument Ranking

- ❑ Should arguments be ranked objectively or subjectively?

- ❑ Which quality dimensions should be considered for argument ranking?

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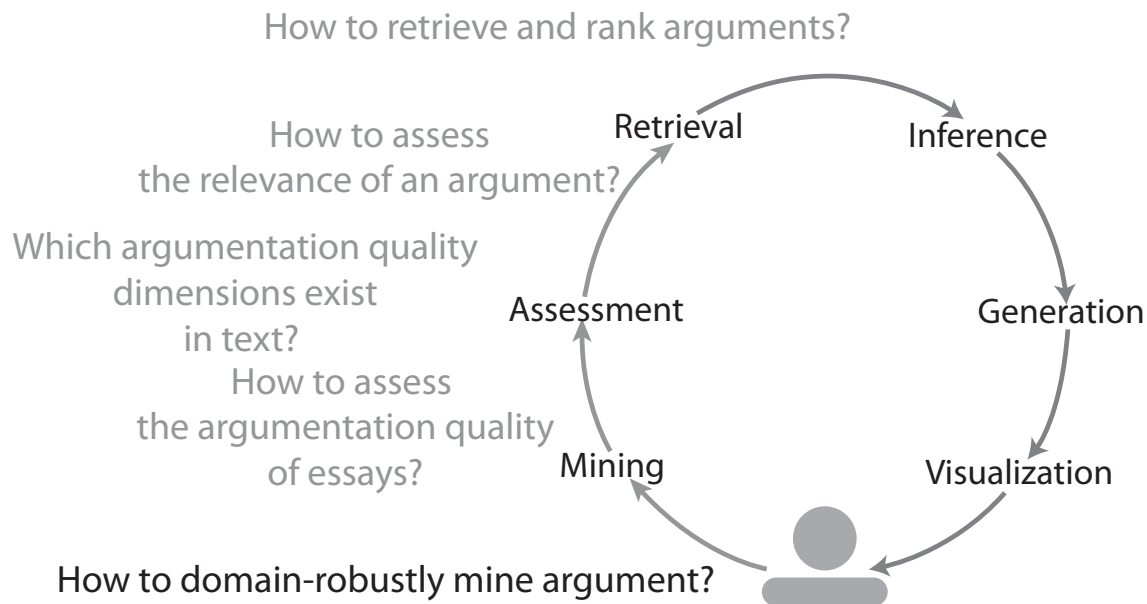
Overview

How to retrieve and rank arguments?

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How to domain-robustly mine argument?

Retrieval → Inference → Generation → Visualization → Mining → Assessment → Retrieval

Computational Argumentation at Webis

Domain Robustness in Argument Mining

Computational models for argument mining rely on an annotated corpus to acquire the knowledge needed to extract arguments in real world applications

❏ Existing models are developed for one domain, e.g. essays

❏ Models are domain-dependent and fail to generalize to other domains

❏ Corpora creation is very expensive

Development

Model ⟶ Corpus

Application

Model ⟶ WWW

Computational Argumentation at Webis

Domain Robustness in Argument Mining

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Development

❑ Existing models are developed for one domain, e.g. essays

Model →

Corpus

❑ Models are domain-dependent and fail to generalize to other domains

Application

❑ Corpora creation is very expensive

Model →

WWW

How to model argumentation on the Web ?
How to domain-robustly mine the Web for arguments ?

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What type of evidence do people
use in persuasive text ?

What argumentation strategies
do people follow to achieve
persuasion ?
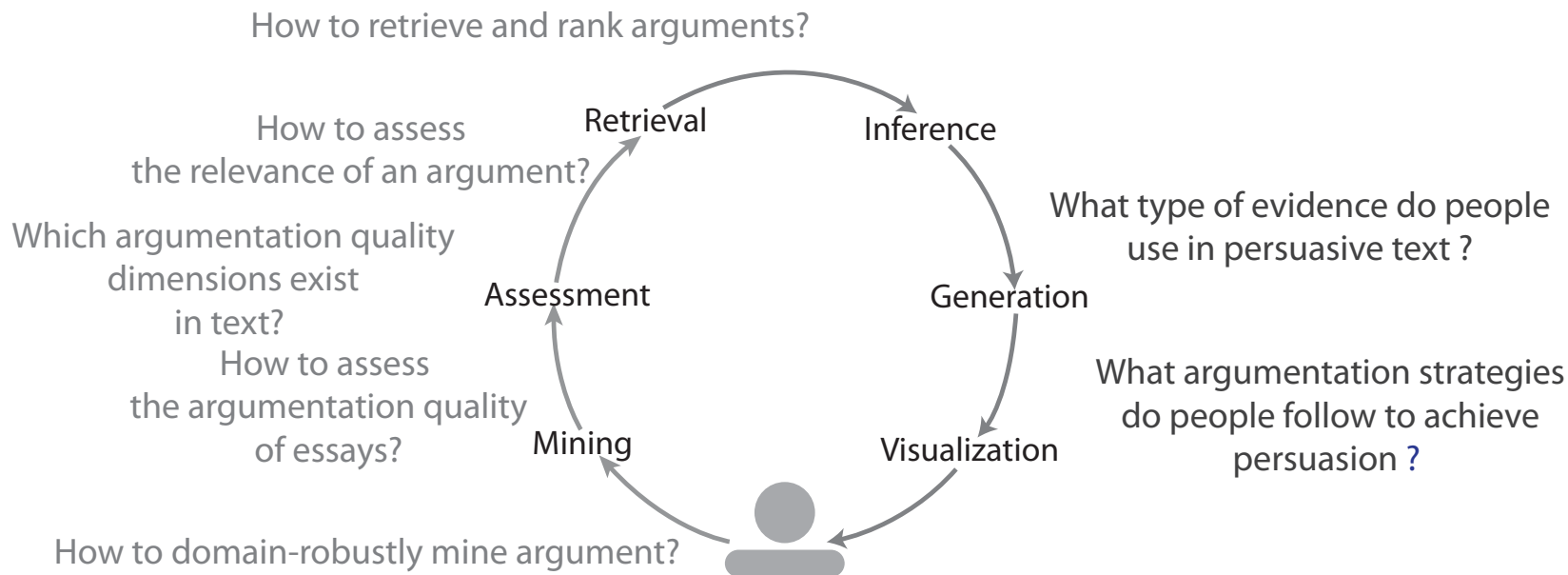
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Argumentation Strategies

Argumentation strategies are guiding principles to choose, arrange and phrase arguments to achieve persuasion

Author

Audience

Appeal to emotion

Appeal to logic

Appeal to credibility
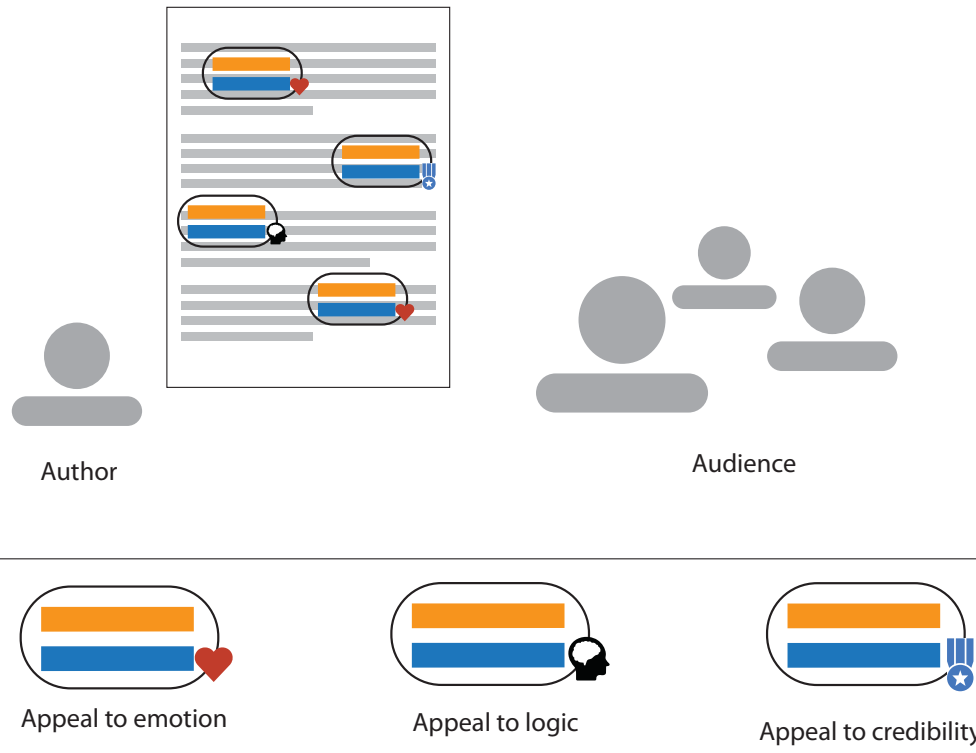
Computational Argumentation at Webis

Argumentation Strategies
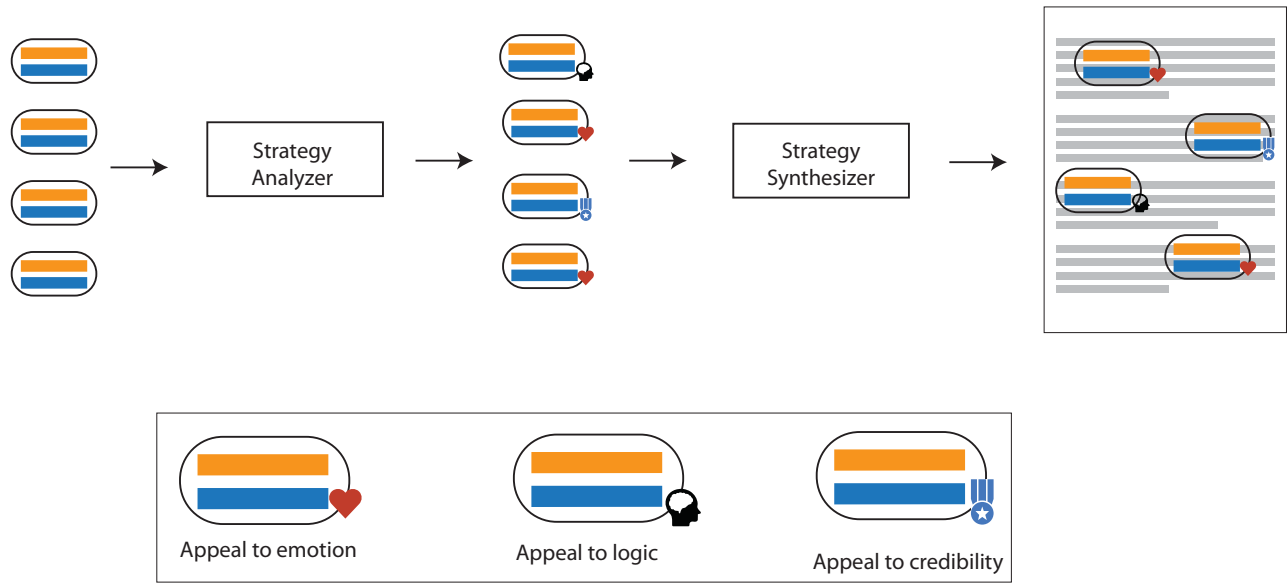
Computational Argumentation at Webis

Argumentation Strategies
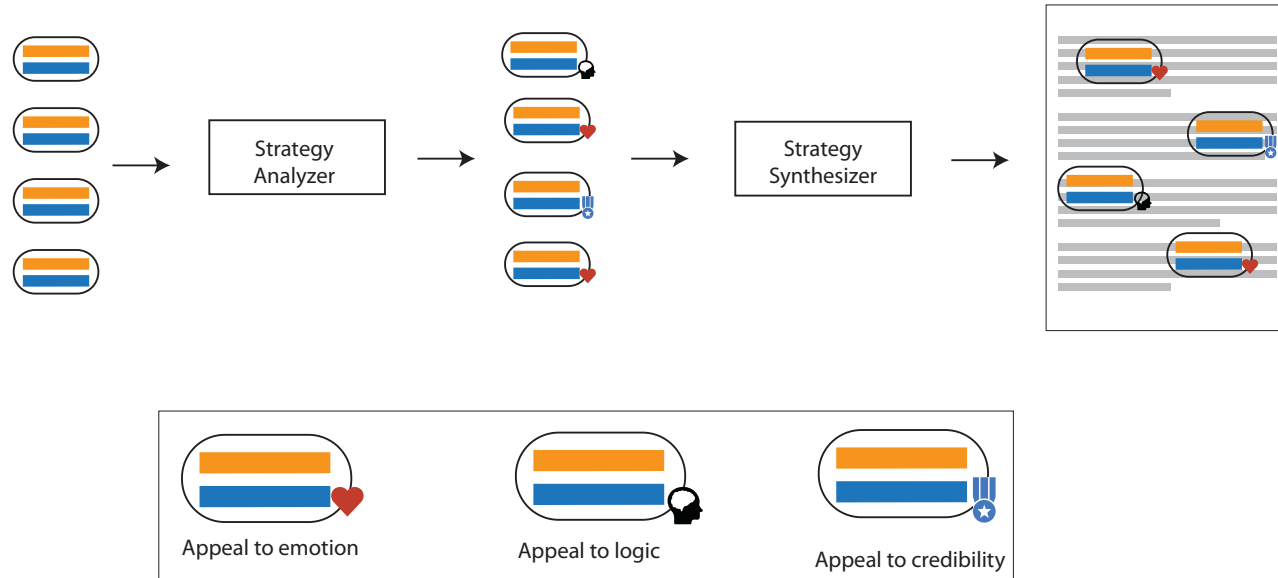
- What type of evidence do people use for persuasion? e.g. testimony, anecdotes
- How to model argumentation strategies in text? e.g. sequence vs tree
- Do people use different argumentation strategies in different topics?

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Conclusion
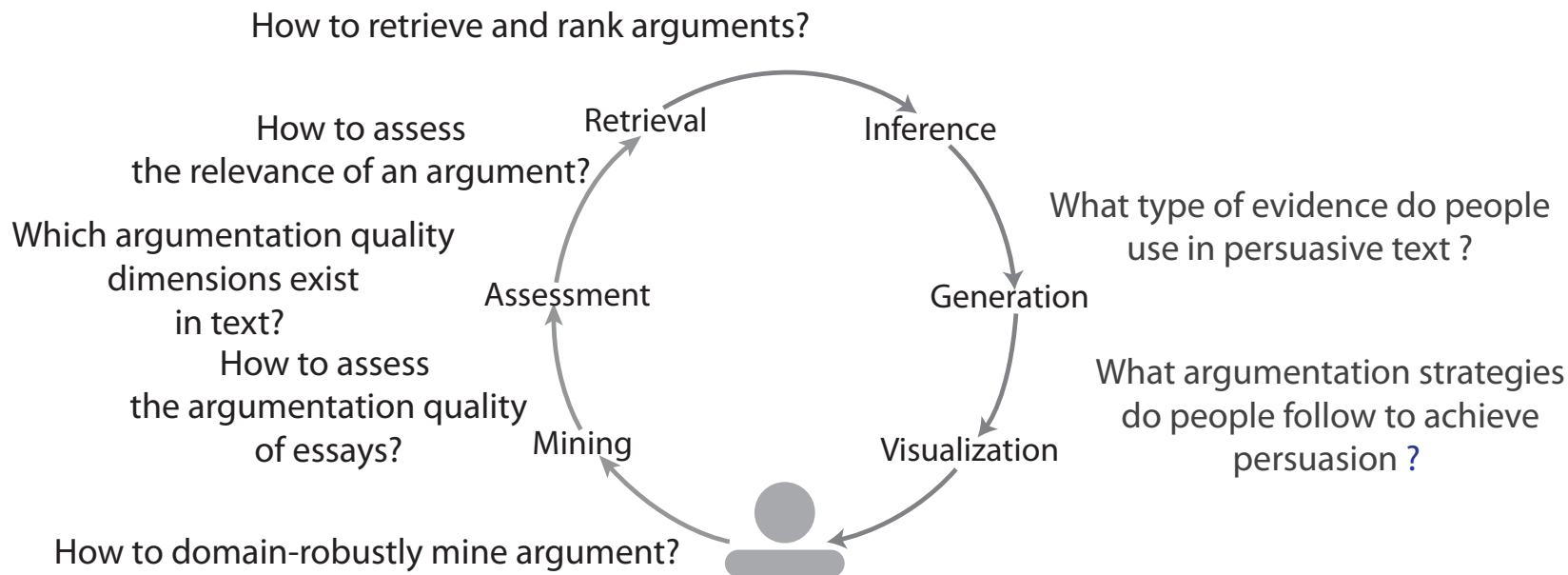
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Computational Argumentation at Webis

Future Work: Argumentation Summarization

Monological argumentation summarization aims at simplifying the argumentation of a text into one argument
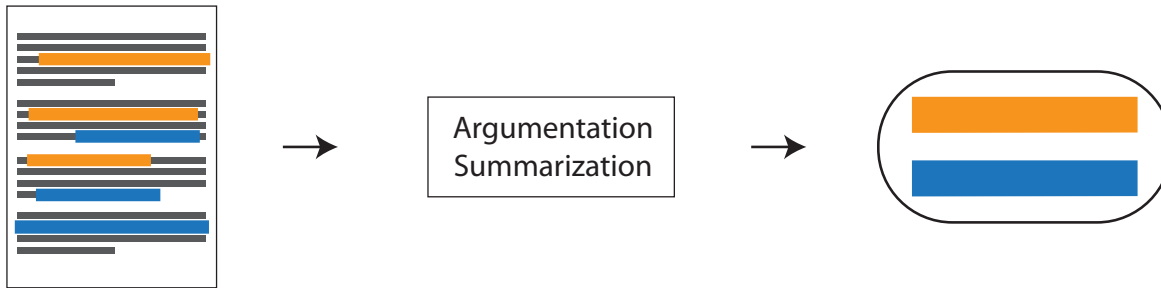
Computational Argumentation at Webis

Future Work: Argumentation Summarization

Monological argumentation summarization aims at simplifying the argumentation of a text into one argument

Dialogical argumentation summarization aims at extracting the main arguments of the contending participants
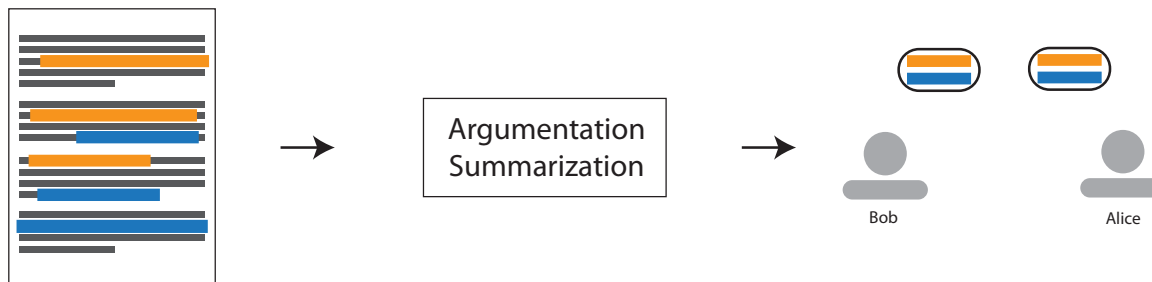
Computational Argumentation at Webis

Future Work: Interactive Argument Search

Computational Argumentation at Webis

Future Work: Interactive Argument Search

args

Q Drugs should be legal →

Page 1 of 4203 arguments, 2140 pro, 2063 con (retrieved in 81.6ms)   Pro vs. Con View | Overall Ranking View

Pro

Drugs should be legal because the majority of...
http://www.debate.org/debates/should-drugs-be-legal/3/
Drugs should be **legal** because the majority of deaths involving **drugs** are due to selling them illegally. ... ▾ score

People who do drugs have a right to treat there...
http://www.debate.org/debates/should-drugs-be-legal/3/
People who do **drugs** have a right to treat there bodies the way they want as long as they are not hurting anybody else. If **drugs** are **legal** when people are being affected by ... ▾ score

In a free society people should have a choice of...
http://www.debate.org/debates/All-Drugs-Should-Be-Legal/6/
if they want to. 2.Why **should** alcohol and tobacco be **legal** but other dangerous substances not. Alcohol and tobacco are dangerous and deadly substances, so why **should** they be ... ▾ score

A the other debater) said and than i am going to...
http://www.debate.org/debates/All-Drugs-Should-Be-Legal/6/
said and than i am going to talk about some more reasons why we **should** legalize **drugs**. Now i am going ... applied to alcohol and tobacco. 2.'I also think that Marijuana **should** be ... ▾ score

"Heroin can kill an average person quicker than...
http://www.debate.org/debates/Drugs-must-be-made-legal/1/
be ridicu...
and total...

2) The...
http://ww...
failed an...
score

If it wa...
http://ww...
kill me a...
should ...

Banni...
http://www.debate.org/debates/Drugs-must-be-made-legal/1/
would be ludicrous, and we **should** treat illegal **drugs** with that same mentality. Legalizing **drugs** ... Thank you for the opportunity to debate this topic. A brief note: It ... ▾ score

350+ people a year die from it. ("And if drugs...
http://www.debate.org/debates/Drugs-must-be-made-legal/1/
a year die from it. ("And if **drugs** were made **legal** I fail to see how it would stop drug dealers from ... was not clear. Like I said before– some of these are far stranger than taking ... ▾ score

To expand on the above point, when a product...
http://www.debate.org/debates/Drugs-Should-Be-Legalized/3/
; mobs gain monopolies on products and use brute force to achieve their means. If **drugs** were **legal** ... Portugal decriminalized **drugs**. 14 years later, the data showed "that ... ▾ score

Con

Drugs shouldn't be legal because nothing good...
http://www.debate.org/debates/should-drugs-be-legal/3/
Drugs shouldn't be **legal** because nothing good comes **drugs**. Some **drugs** are addictive and you would keep on wanting them. If you do to many you will overdose and after a ... ▾ score

There are many deaths in drunk driving related...
http://www.debate.org/debates/End-the-Drug-War.....All-drugs-should-be...
accidents. 2) I also think that Marijuana **should** be legalized, just not other **drugs**. Cigarettes and alcohol are more dangerous, and shouldn't be **legal** compared to marijuana. 3) I ... ▾ score

If some drugs are too dangerous or addictive and...
http://www.debate.org/debates/End-the-Drug-War.....All-drugs-should-be...
that, then it shouldn't be sold and **should** be "illegal". Therefore, to argue that all **drugs should** be **legal** to consume ... and distributing that drug though, **should** ... ▾ score

To use drugs damages mind and body there is no...
http://www.debate.org/debates/Should-illegal-drugs-become-legal/1/
and body there is no way they **should** be made **legal** ... My case is based on the Psychological and medical aspect. when taking **drugs** such as crack, pot ... ▾ score

If you legalize drugs there would still be...

d still be illegal drug

ple that buy and die of

alth, while the **legal**

By way of example, one could insist that the...
http://www.debate.org/debates/drugs-should-be-legalized/2/
one could insist that the resolution means, "there exist some **drugs** that are not yet **legal** for consumption that **should** become **legal** for consumption," which would be trivial ... ▾ score

Tobacco and alcohol are much less dangerous than...
http://www.debate.org/debates/Drugs-must-be-made-legal/1/
dangerous and thus **should** not be made **legal**. 3. "We have the right to put whatever we like within our bodies ... " If your point is to suggest that I think that the speed makes the ... ▾ score

People take strange risks for charity I agree but...
http://www.debate.org/debates/Drugs-must-be-made-legal/1/
People take strange risks for charity I agree but not taking **drugs**. You also said that you provided ... it. And anyway those would be efforts to tiny, I do not call them efforts. Some of the ... ▾ score
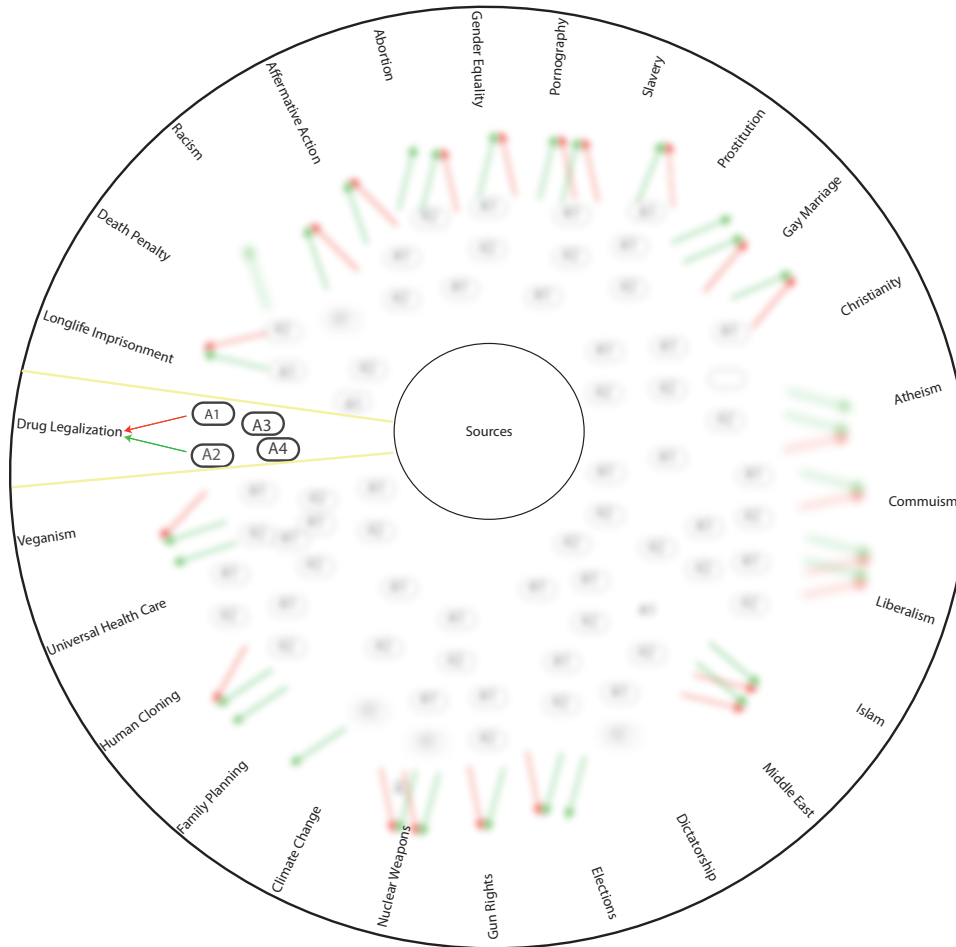
**arguments' attributes and relations
are hard to show and explore using
conventional search techniques and interfaces!**

Future Work: Interactive Argument Search

End