Computational Argumentation at Webis

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Computational Argumentation at Webis

Overview

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

How to assess the argumentation quality of essays?
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?

Contributions

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

Retrieval
Inference
Generation
Visualization
Assessment
Mining

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?
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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

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?

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?
- Which argumentation quality dimensions exist in text?
- How to assess the argumentation quality of essays?
Argument relevance is one dimension of argument quality and measures the contribution an argument makes in resolving a debate.
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How to computationally assess argument relevance?
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How to computationally assess argument relevance?

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

How to retrieve and rank arguments?

How to assess the relevance of an argument?

Which argumentation quality dimensions exist in text?

How to assess the argumentation quality of essays?
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Argument Search Engine

Argument search engine retrieves the best arguments which support or attack a given query.
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Argument Search Engine

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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Challenges in argument search

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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?

How to assess the relevance of an argument?

Which argumentation quality dimensions exist in text?

How to assess the argumentation quality of essays?

How to domain-robustly mine argument?
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
Computational models for argument mining rely on an annotated corpus to acquire the knowledge needed to extract arguments in real world applications.

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

- How to retrieve and rank arguments?
- How to assess the relevance of an argument?
- Which argumentation quality dimensions exist in text?
- How to assess the argumentation quality of essays?
- How to domain-robustly mine argument?

- 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.
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Argumentation Strategies

- Appeal to emotion
- Appeal to logic
- Appeal to credibility
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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

How to retrieve and rank arguments?

How to assess the relevance of an argument?

Which argumentation quality dimensions exist in text?
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Future Work: Argumentation Summarization

Monological argumentation summarization aims at simplifying the argumentation of a text into one argument.
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Dialogical argumentation summarization aims at extracting the main arguments of the contending participants.
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Future Work: Interactive Argument Search

Pro

Drugs should be legal because the majority of...
Drugs should be legal because the majority of deaths involving drugs are due to setting them illegally...

People who do drugs have a right to treat their lapses the way they want as long as they are not hurting anybody else. If drugs are legal when people are being affected by...

In a free society people should have a choice of...

A the other debater said and than i am going to go...

Herein can kill an average person quicker then...

2) The war on drugs has failed and should stop...

If it was killing 100,00 people a year then...

Banning these things would be ludicrous, and we...

350+ people a year die from it. (And if drugs...

To expand on the above point, when a product...

Con

Drugs shouldn’t be legal because nothing good...

There are many deaths in drunk driving related...

If some drugs are too dangerous or addictive and...

To use drugs damages mind and body there is no...

If you legalize drugs there would still be…

Heroin can kill an average person quicker than...

Pro, since he is proposing a dramatic shift from...

By way of example, one could insist that the...

Tobacco and alcohol are much less dangerous than...

People take strange risks for charity I agree but...

Score: 9.60
arguments’ attributes and relations are hard to show and explore using conventional search techniques and interfaces!
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Future Work: Interactive Argument Search
End