

Argumentation Technology for Artificial Intelligence

Part 3: Argument Retrieval

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webis.de

3.1 Argument Retrieval Problems

3.2 Argument Ranking

3.3 Resources

3.4 Argument Search Engines

3.5 Shared Tasks

Basic Argument Model

Conclusion *Mankind will be able to travel to other galaxies.*

Premise 1 *Photon drives can take you up to relativistic velocities.*

Premise 2 *In August 2019 Lightsail2 demonstrated its functioning.*

Premise 3 *NASA announces progress on torpor (human hibernation).*

Argument:

□ A conclusion (claim) supported by premises (reasons). [Walton et al. 2008]
Conclusion and premises are considered as propositions.

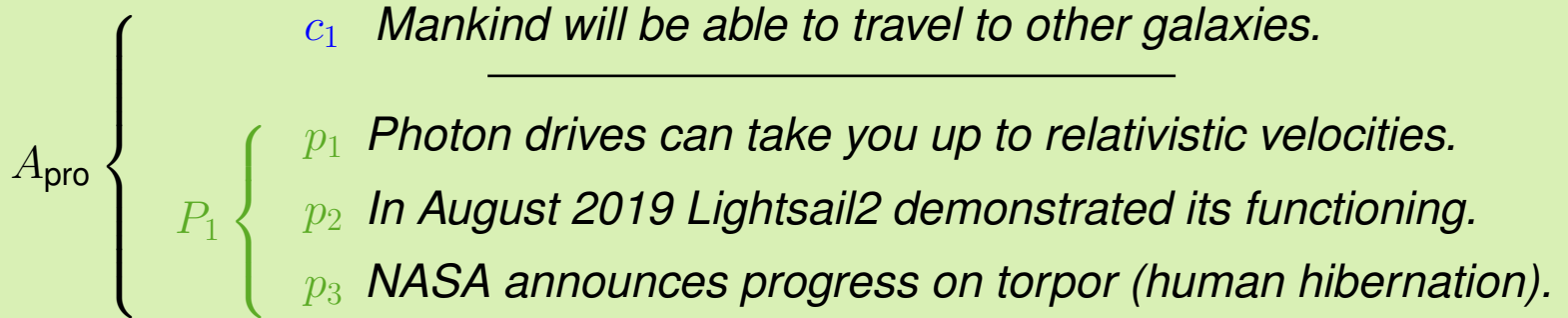
□ Conveys a stance on a controversial topic. [Freeley and Steinberg, 2009]
Assignment of truth values to the propositions:

$\mathcal{I}(\text{"Mankind will be able to travel to other galaxies."}) = 1, \mathcal{I}(\text{"Photon ..."}) = 1, \dots$

□ The mechanism (“calculus”, “argumentation type”) to obtain (“derive”) the conclusion from the premises is left implicit and is usually informal.

Basic Argument Model

Thesis / Major claim t *Human beings will colonize other planets.*



- Note: $c_1 \succ t$
- “ c_1 supports t ” (entailment in a cogent, nonobligatory sense)
 - “ t is compatible with c_1 ” (but the real argumentation focus)

Basic Argument Model

Thesis / Major claim t *Human beings will colonize other planets.*

A_{pro} { c_1 Mankind will be able to travel to other galaxies.
 P_1 { p_1 Photon drives can take you up to relativistic velocities.
 p_2 In August 2019 Lightsail2 demonstrated its functioning.
 p_3 NASA announces progress on torpor (human hibernation).

A_{con} { c_2 Mankind will never explore other galaxies.
 P_2 { p_4 Matter cannot pass through wormholes.
 p_5 Hawkins explained why time travel is impossible.

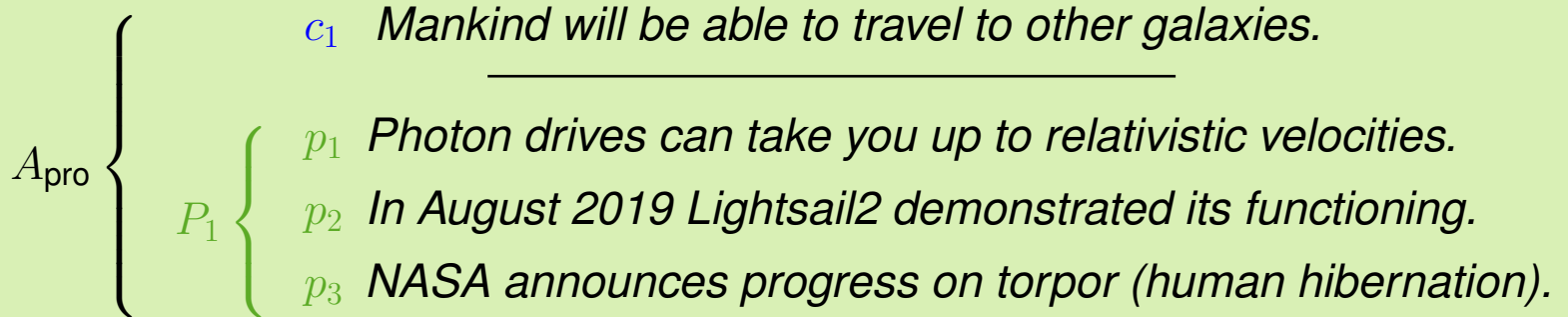
- The standard interpretation \mathcal{I} of all propositions, t , c_i , p_j , is 1 (true).

Note:

- $c_1 \approx \neg c_2$ “ $\neg c_2$ is a paraphrase of c_1 ”
- $\Rightarrow c_2$ can be expressed as c_1 with opposite truth assignment, $\mathcal{I}(c_1) = 0$, $\mathcal{I}(c_2) = 1$

Retrieval Problems (1) Π_{rel}

Query *Will human beings colonize other planets?*



Given in Π_{rel} :

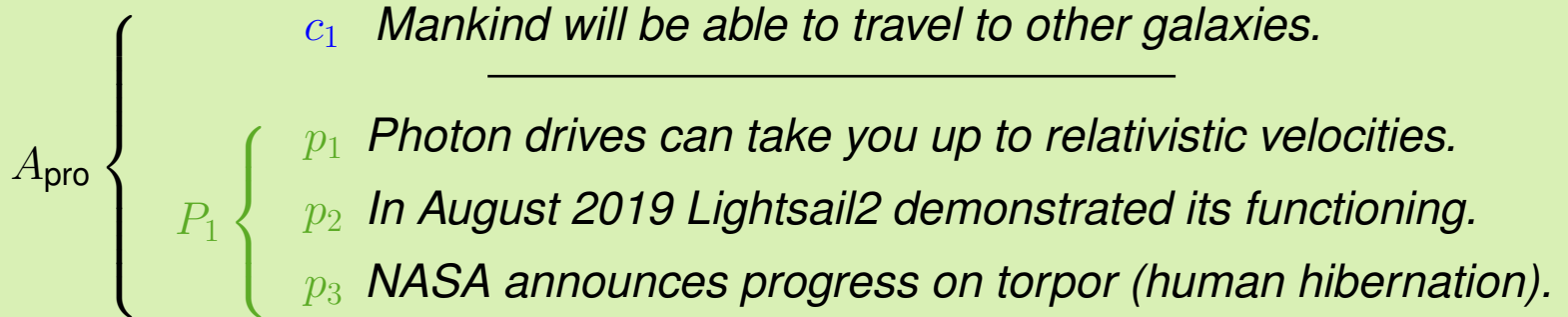
- information need, expressed as query, $q \in Q$
- set of arguments, $\mathbf{A} = \{(c_1, P_1), (c_2, P_2), \dots, (c_n, P_n)\}$
- * (possibly hidden) human selection of the relevant arguments, \mathbf{A}_q^* , $q \in Q$

Sought in Π_{rel} :

- a relevance function $\rho : Q \times \mathbf{A} \rightarrow \{0, 1\}$, such that ...
the macro-averaged F -measure (precision, recall) regarding \mathbf{A}_q^* , $q \in Q$, is maximum

Retrieval Problems (2) Π_{rank}

Query *Will human beings colonize other planets?*



Given in Π_{rank} :

- information need, expressed as query, $q \in Q$
- set of relevant arguments, $\mathbf{A}_q = \{(c_1, P_1), (c_2, P_2), \dots, (c_m, P_m)\}$
- * (possibly hidden) human ranking of the relevant arguments, $\pi_{\mathbf{A}_q}^*$, $q \in Q$

Sought in Π_{rank} :

- a ranking function $\sigma : Q \times \mathcal{P}(\mathbf{A}) \rightarrow \Pi$, such that ...
the mean rank correlation \bar{r} regarding $\pi_{\mathbf{A}_q}^*$, $q \in Q$, is maximum

Retrieval Problems (3) – (6)

3. Π_{counter} Retrieve the “best” counterargument

Given: query q , argument set A , argument A

4. Π_{sameside} Retrieve (all) arguments with the same stance

Given: argument set A , argument A

5. Π_{argdoc} Is the document argumentative?

Given: document d

6. Π_{argquery} Is the query argumentative?

Given: query q

Notes:

- Π_{counter} can be cast as Π_{rank} if the query is negated.
- Π_{docquery} and Π_{argquery} are decision problems.
- Π_{counter} and Π_{sameside} can be cast as decision problems as well.
- Challenge: development of **domain-independent** or “**topic-agnostic**” approaches.

Take Home Messages

3.1 Argument Retrieval Problems

- basic argument model: $(c, \{p_1, p_2, \dots, p_{|c|}\})$
- relevant retrieval problems: $\Pi_{\text{rel}}, \Pi_{\text{rank}}, \Pi_{\text{counter}}$

3.1 Argument Retrieval Problems

3.2 Argument Ranking

3.3 Resources

3.4 Argument Search Engines

3.5 Shared Tasks

(1) A Topic-Agnostic Solution for Π_{rank}

The screenshot shows a search interface for 'args' with the query 'abortion'. The results are organized into two columns: 'PRO' and 'CON'. Each result includes a title, a 'Show full argument' link, a short summary, and a URL with a score. The 'PRO' column contains five results, and the 'CON' column contains five results. The results are as follows:

PRO	CON
Abortion is the ending of pregnancy by the removal or... ► Show full argument Abortion is the ending of pregnancy by the removal or forcing out from the womb of a fetus or embryo before it is able to survive on its own. An abortion can occur spontaneously, in which ... https://www.debate.org/debates/abortion/350/ score ▼	In 2011 there were about 730,322 abortions reported to... ► Show full argument In 2011 there were about 730,322 abortions reported to the centers for disease control. There are about 1.7% of abortion of women's ages from 15-44 each year. Women who already had abortion ... https://www.debate.org/debates/Abortion/545/ score ▼
Great, another forfeiter. As someone who has debated... ► Show full argument Great, another forfeiter. As someone who has debated abortion before, I will put a link to my original abortion debate right here: http://www.debate.org... I will be using arguments that ... https://www.debate.org/debates/Abortion/328/ score ▼	The greatest destroyer of peace is abortion because if a... ► Show full argument "The greatest destroyer of peace is abortion because if a mother can kill her own child, what is left for me to kill you and you to kill me? There is nothing between," says Mother Teresa. ... https://www.debate.org/debates/Abortion/507/ score ▼
This should be fun :) The legalisation of abortion has... ► Show full argument This should be fun :) The legalisation of abortion has been a big issue worldwide for a long period of time, not only politically but also on social and religious fronts. Abortion can be ... https://www.debate.org/debates/Abortion/156/ score ▼	Yes the government has the obligation to protect the... ► Show full argument Yes the government has the obligation to protect the rights of people, in general. Women have a right to decide whether and when to become a parent. But not abortion , it's an ending life ... https://www.debate.org/debates/abortion/348/ score ▼
There are many good and bad sides to abortion, But just... ► Show full argument There are many good and bad sides to abortion . But just like everything, There is no black and white. Just a whole range of gray. Abortion is one way that poverty can decrease. Most unplanned ... https://www.debate.org/debates/Abortion/741/ score ▼	Thank you, Pro. Negative CaseA1: False equivalencin the... ► Show full argument Thank you, Pro. Negative CaseA1: False equivalencin the first round, in order to clarify the single word " abortion " into a resolution, my opponent elaborates: "if abortion is murder, so ... https://www.debate.org/debates/Abortion/392/ score ▼
Although I oppose abortion in most cases, I accepted this... ► Show full argument Although I oppose abortion in most cases. I accepted this debate because Con's position is that abortion "can never be justified regardless of circumstances." That is the point I want to ... https://www.debate.org/debates/abortion/309/ score ▼	Abortion is wrong! Abortion is gross! Abortion is... Abortion is wrong! Abortion is gross! Abortion is MURDER!!!! Attacks: Abortion https://www.debate.org/debates/Abortion/468/ score ▼
Abortion is needed to control the population so that the... ► Show full argument Abortion is needed to control the population so that the population doesn't get too excess. By the 22 century, the population estimated to be 11.2 billion people and if abortion were illegal, ... https://www.debate.org/debates/Abortion/543/ score ▼	Thank you to both the audience and my opponent for yet... ► Show full argument Thank you to both the audience and my opponent for yet another debate on abortion . The resolution is simply " Abortion " and my opponent has stated that he supports the affirmative. I shall ... https://www.debate.org/debates/Abortion/33/ score ▼



+ Query

Retrieval

"Argumentative" documents

Argument mining

Arguments

Relation detection

Paraphrase analysis

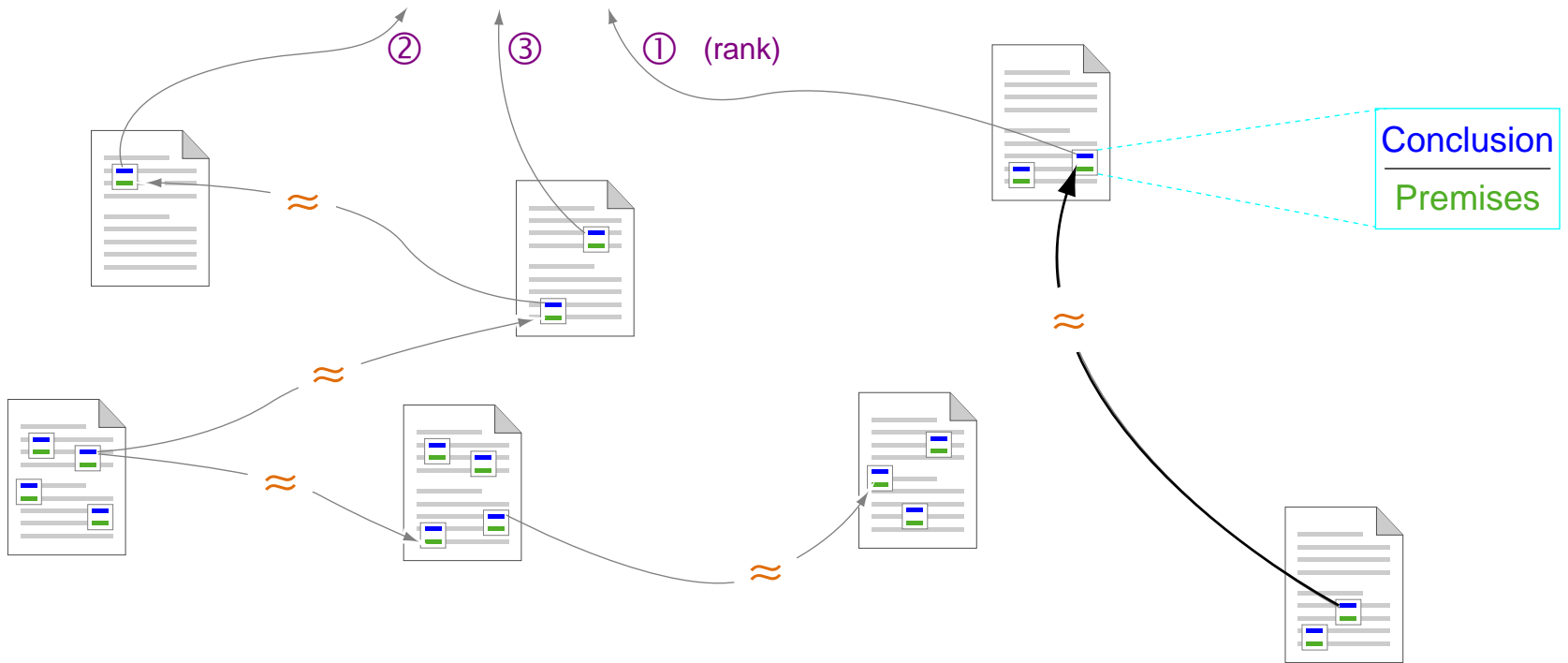
Graph analysis

Argument graph

"PageRank"

Ranking

Query *Reintroduce death penalty?*



Death penalty should be abolished.

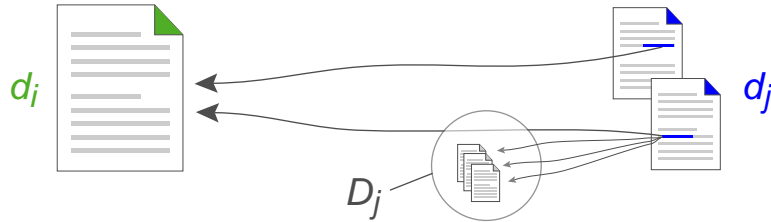
It does not prevent people from committing crimes.



The death penalty doesn't deter people from committing serious violent crimes.

A survey of the UN on the relation between the death penalty and homicide rates gave no support to the deterrent hypothesis.

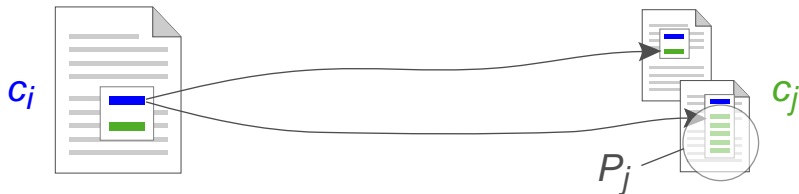
$$p(d_i) = (1 - \alpha) \cdot \frac{1}{|D|} + \alpha \cdot \sum_j \frac{p(d_j)}{|D_j|}$$



Original PageRank [Page et al. 1999]

1. ground relevance + recursive relevance
2. d_j links to $d_i \rightsquigarrow$ increase PageRank(d_i)
3. reward exclusive links
4. uniform ground relevances (sum to 1)

$$\hat{p}(c_i) = (1 - \alpha) \cdot \frac{p(d_i) \cdot |D|}{|A|} + \alpha \cdot \sum_j \frac{\hat{p}(c_j)}{|P_j|}$$



ArgRank [Wachmuth/Stein, 2017]

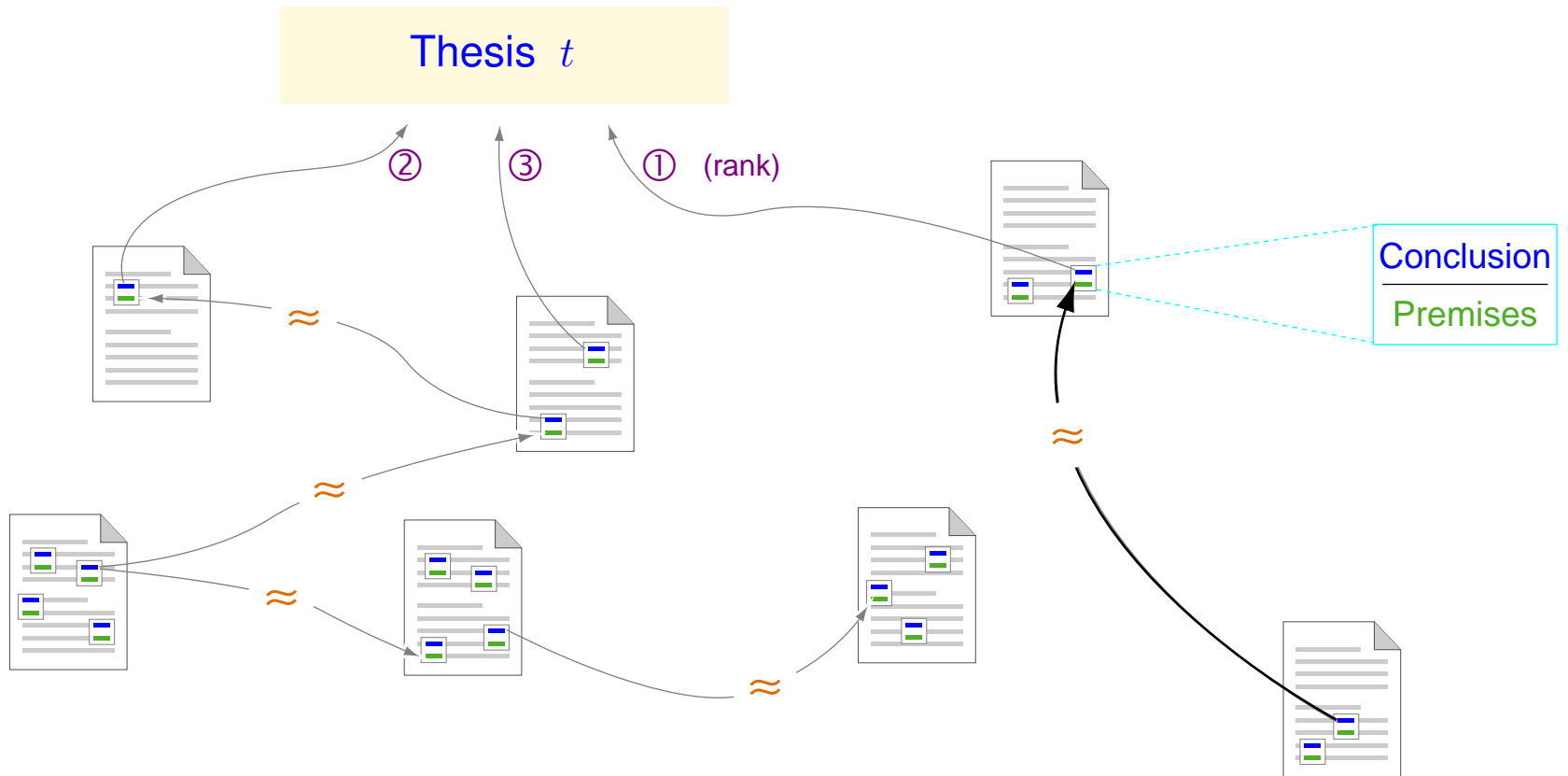
1. ground strength + recursive relevance
2. c_i premise for $c_j \rightsquigarrow$ increase ArgRank(c_i)
3. reward exclusive premises
4. ground strength \sim PageRank

“Reversal of Evidence”

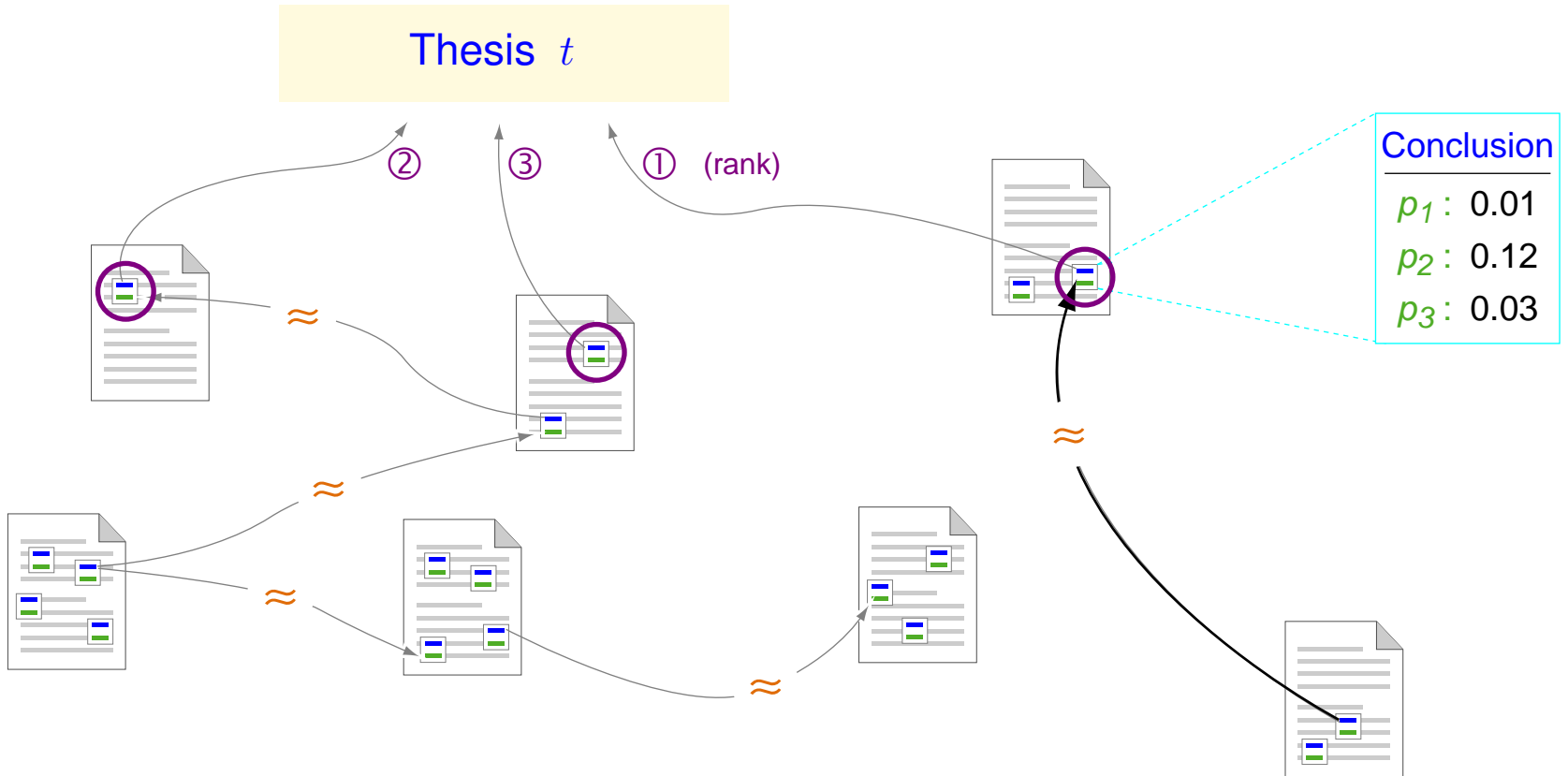
PageRank: Author cannot enforce links to her web page.

ArgRank: Author cannot enforce use of her argument.

From Premise Scores to Argument Ranks



From Premise Scores to Argument Ranks



How to weigh the premise scores of the matching arguments?

(maximum, average, etc.)

Ranking with Argument Graphs

Case Study: Graph Construction

Construction of a raw graph using 57 corpora from the [Argument Web](#) :

28 875 Argument units, used in ...

17 877 Arguments

Processing steps towards an argument graph:

3 113 Conclusions with ≥ 1 argument, where ...

498 have multiple premises, from which ...

70 have a relevant claim, from which ...

32 are used in 110 intelligible arguments.

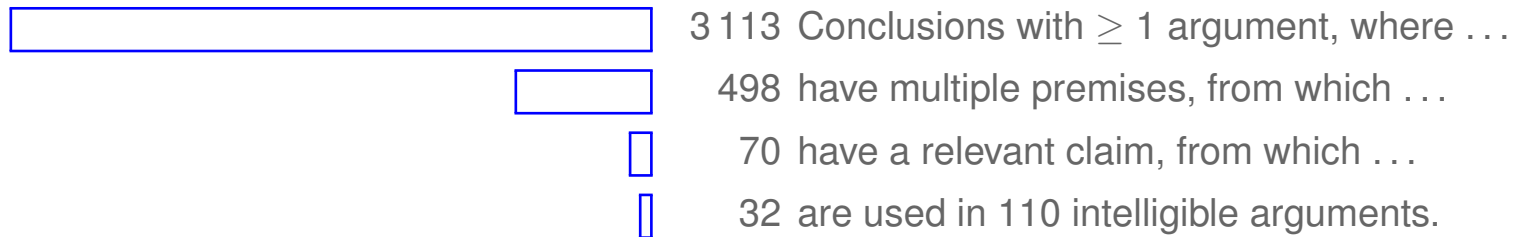
Ranking with Argument Graphs

Case Study: Graph Construction

Construction of a raw graph using 57 corpora from the [Argument Web](#) :



Processing steps towards an argument graph:



Acquisition of a ranking ground truth:

- 7 experts from NLP and IR ranked all arguments (110) for each conclusion (32)
- $\tau = 0.59$ as highest agreement between two experts (mean: $\tau = 0.36$)

Ranking with Argument Graphs

Case Study: Results

Ranking approach	Premise score computation				
	Minimum	Average	Maximum	Sum	Best
	τ	τ	τ	τ	τ
1. PageRank	0.01	0.02	0.11	0.28	0.28
2. Frequency	-0.10	-0.03	-0.01	0.10	0.10
3. Similarity	-0.13	-0.05	0.01	0.02	0.02
4. Sentiment	0.01	0.11	0.12	0.12	0.12
5. Most premises	-	-	-	-	0.19
6. Random	-	-	-	-	0.00

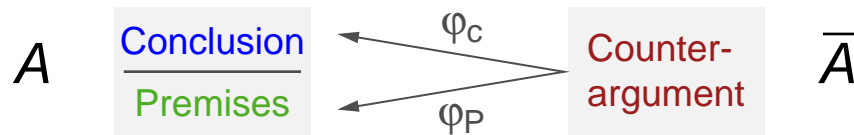
Approach 1: An argument's relevance corresponds to the ArgRank of its premises.

(2) A Topic-Agnostic Solution for Π_{counter} [\[idebate\]](#)

(2) A Topic-Agnostic Solution for Π_{counter}

Idea: Given an argument A , the best counterargument \bar{A}^* employs premises that are **similar wrt. topic**, but takes the **opposite stance**.

→ Consider both similarities to the premises and conclusion [Walton 2009] :



How to compute these similarities?

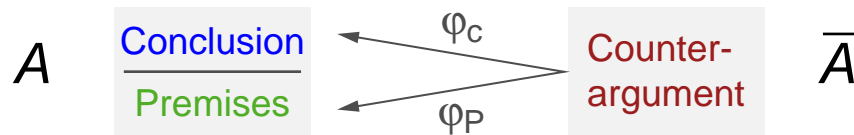
How to combine these similarities?

(= What is a sensible hypothesis space of promising model functions?)

(2) A Topic-Agnostic Solution for Π_{counter}

Idea: Given an argument A , the best counterargument \bar{A}^* employs premises that are **similar wrt. topic**, but takes the **opposite stance**.

→ Consider both similarities to the premises and conclusion [Walton 2009] :



Proposed model function to rank counterarguments [Wachsmuth et al., 2018] :

$$R(A, \bar{A}) = \alpha \cdot \underbrace{(\varphi_{\text{conclusion}} \circ \varphi_{\text{Premises}})}_{\text{topic similarity} \rightarrow \text{max}} - (1 - \alpha) \cdot \underbrace{(\varphi_{\text{conclusion}} \circ \varphi_{\text{Premises}})}_{\text{stance similarity} \rightarrow \text{min}}$$

where

φ combines both word and embedding similarities

$\circ \in \{\text{min}, \text{max}, +, *\}$

$\alpha \in [0; 1]$

(2) A Topic-Agnostic Solution for Π_{counter} Corpus and Analysis

Theme	Debates	Points	Counters
Culture	46	278	278
Digital freedoms	48	341	341
Economy	95	590	588
⋮			
Sport	23	130	130
Σ	1069	6779	6753

Corpus:

- based on the iDebate.org portal
- Download: [ArguAna Counterargs](#)

Retrieval experiments (selected results):

Find the best counterargument within ...	True-to-false ratio	Accuracy*
all counters of the same debate	1 : 3	0.75
all counters of the same theme	1 : 136	0.54
all arguments of the entire portal	1 : 2 800	0.32

* The parameters for $R(A, \bar{A})$ were determined by a systematic ranking analysis.

Take Home Messages

3.2 Argument Ranking

- topic agnostic solution for Π_{rank} , based on Page rank
- topic agnostic solution for Π_{counter} , realized via grid search

3.1 Argument Retrieval Problems

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3.5 Shared Tasks



argument interchange
Home of the AIF: Infrastructure for the argument web

CreateDebate

TRUTH MAPPING



convince me
start a debate



intelligence²
DEBATES

Argumentation-Related Resources

Leverage effort	Resource type	Examples
low	Technology Visual inspection Acquisition, Tagging	Argument Web Truthmapping
	Corpora Argumentative structure analysis Argumentation quality analysis Stance detection	AIFdb data IBM Debater data UKP data Webis data
medium	Debate portals English German	Kialo idebate Debatepedia Argumentia
high	Discussion pages Focus on persuasion Controversial issues Focus on deliberation	changemyview reddit WikiTalk
very high	Articles Editorials, Essays Legal Scientific publications	New York Times ACL anthology

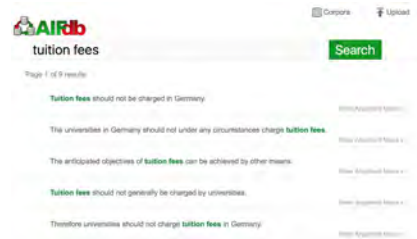
The Argument Web [\[Library\]](#)

AIFdb Corpora



Structured argument data in uniform format

AIFdb Search



Search interface for argument resources

ARG-tech API



Several argument web services

Argublogging



Widget for argument annotation in blogs

OVA



Online visualization and analysis of arguments

Arvina



Dialogue platform based on AIFdb

Take Home Messages

3.3 Resources

- ❑ plethora of resources, which are mainly of academic nature
- ❑ tools, corpora, debates, discussions, argumentative texts

3.1 Argument Retrieval Problems

3.2 Argument Ranking

3.3 Resources

3.4 Argument Search Engines

3.5 Shared Tasks

Vision of Argument Search*

Arguments in future web search:

- support forming opinions
- make it easy to find relevant arguments
- deliberation: learn about other views
- education: learn to debate

Search results should . . .

- rank the best arguments highest
- cover diverse aspects
- cover reliable and heterogeneous sources
- be up-to-the-minute
- be traceable and evaluable

Is time travel possible

About 1,480,000,000 results (0,43 seconds)

[Is time travel possible? - NASA Space Place](#)
<https://spaceplace.nasa.gov> › [review](#) › [dr-marc-space](#) › [time-travel](#) ▼
Time travel is one of my favorite topics! I wrote some time travel stories in junior high school that used a machine of my own invention to travel backwards in time, ...

also ask

- Is time travel backwards possible? ▼
- Is time travel a paradox? ▼
- Are wormholes possible? ▼
- Can we travel close to the speed of light? ▼

Feedback

['We can build a real time machine' - BBC News - BBC.com](#)
<https://www.bbc.com/news/science-environment-44771942> ▼
Jul 11, 2018 - Travelling in time might sound like a flight of fancy, but some physicists think it might really be possible. BBC Horizon looked at some of the ...

[Is Time Travel Possible? | Explore | physics.org](#)
www.physics.org › [article-questions](#) ▼
Travelling forwards in time is surprisingly easy. Einstein's special theory of relativity, developed in 1905, shows that time passes at different rates for people who ...

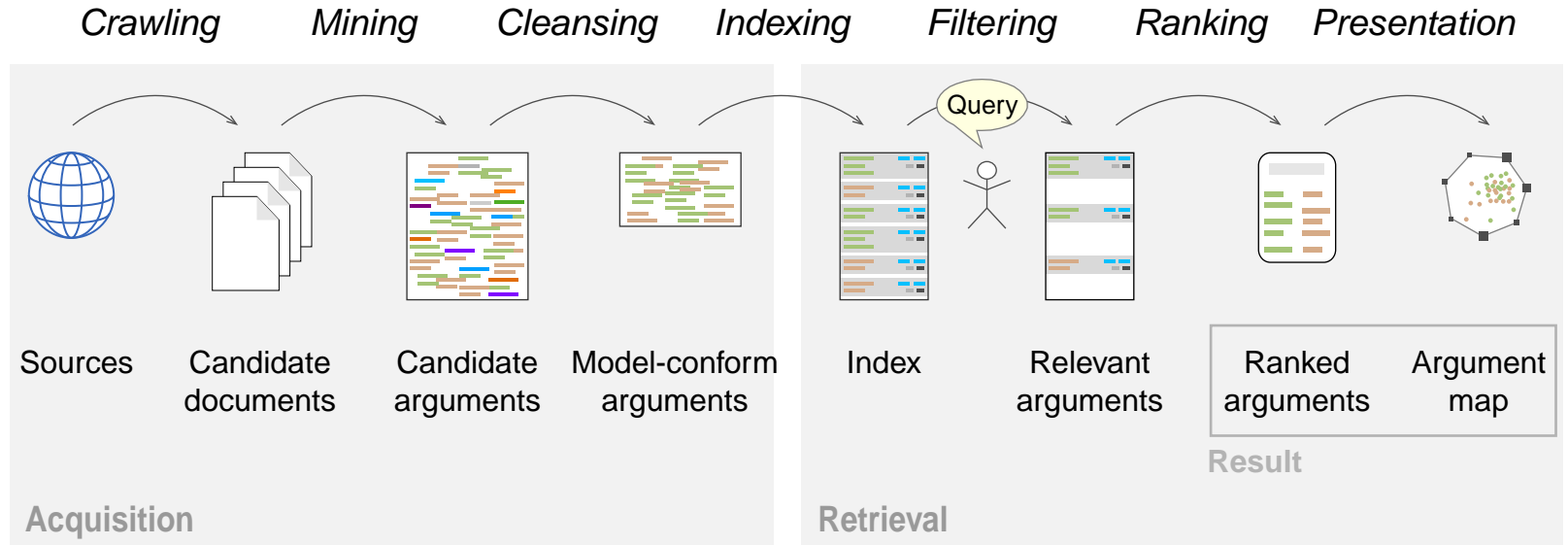
[Is time travel possible? | Tomorrow Today - The Science ... - DW](#)
[.com](#) › [is-time-travel-possible](#) ▼
5 hours ago - This week's viewer question comes from Richard Mack'oloo in Dar es Salaam, Tanzania.

[Time travel - Wikipedia](#)
https://en.wikipedia.org/wiki/Time_travel ▼

* Wachsmuth: Argumentation Retrieval and Analysis. IR Autumn School ASIRF (2018).

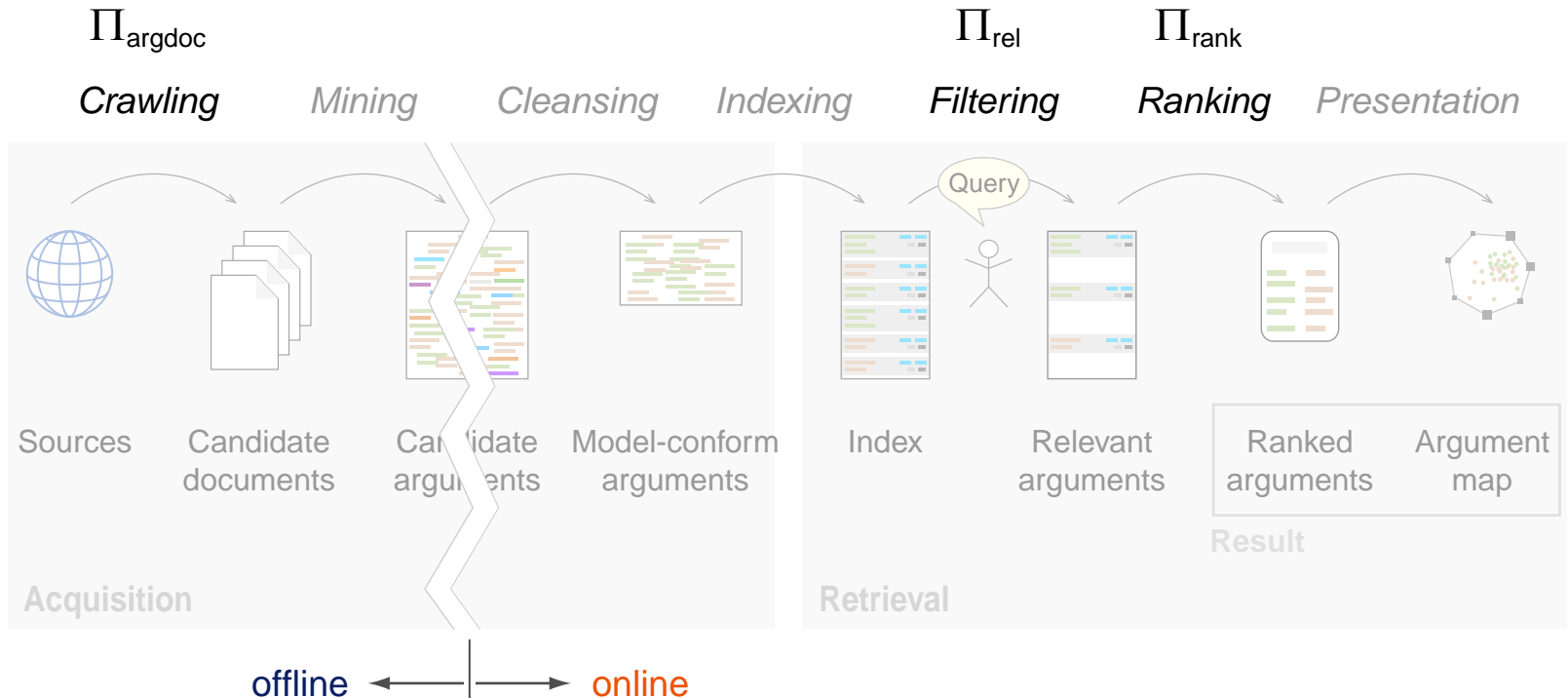
Argument Search Engines

Basic Elements and Process



Argument Search Engines

Basic Elements and Process

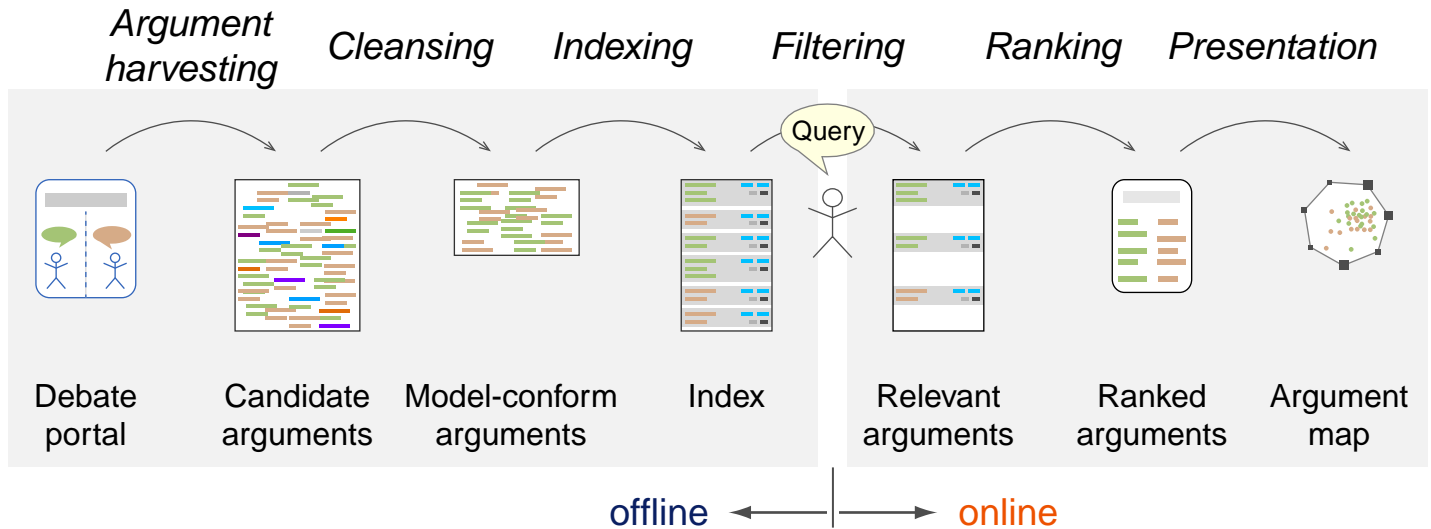


Acquisition paradigm [Ajjour et al., KI 2019]:

- ❑ distribution of processing steps regarding offline time and online time
- ❑ tradeoff between precision, recall, and topicality

Acquisition Paradigms

(a) args.me [Demo]

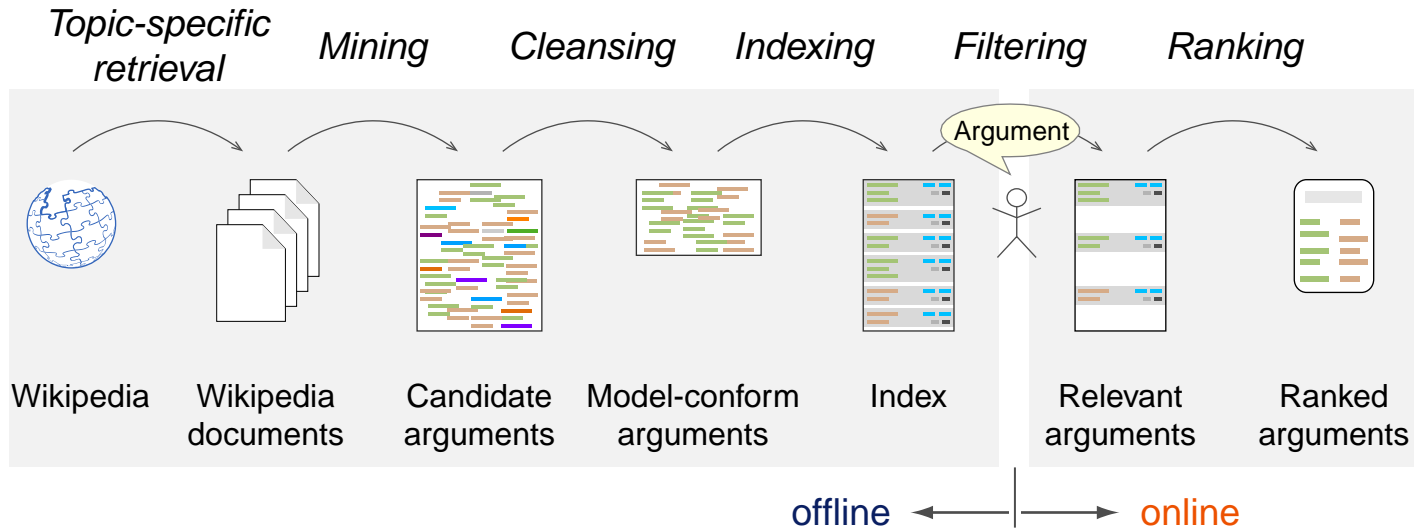


- ❑ Research focus: argument ranking
- ❑ Supervision level: medium (distantly supervised)
- Effectiveness profile: high precision, low recall
- Stance balance: guaranteed
- Efficiency: high

Acquisition Paradigms



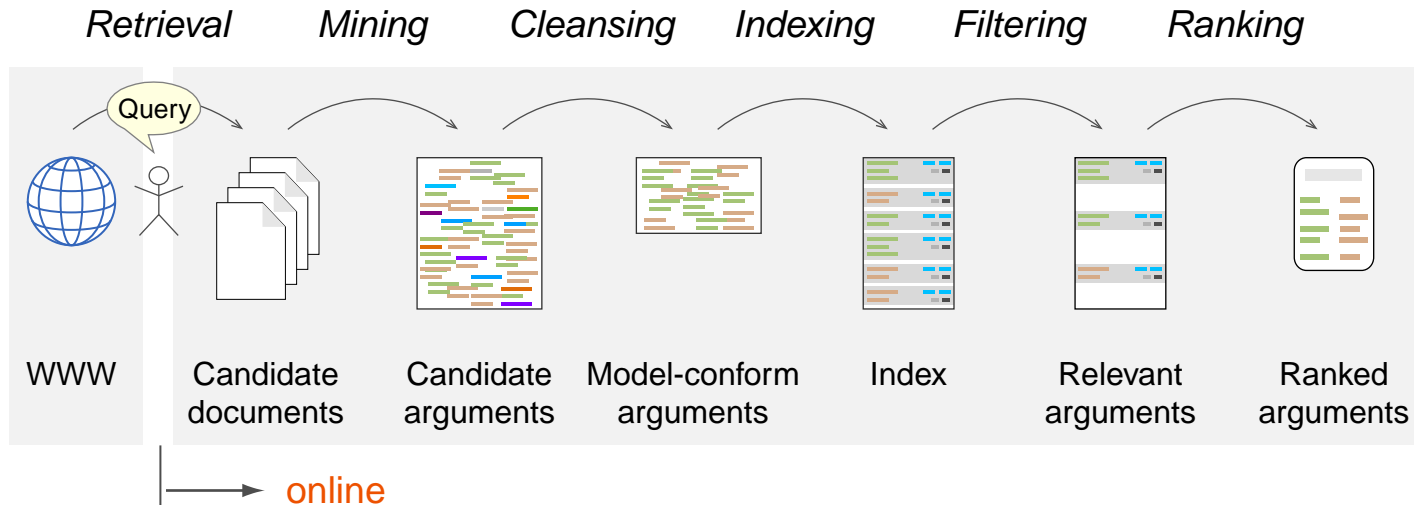
(b) IBM Debater [Project]



- ❑ Research focus: debating technology
- ❑ Supervision level: medium (recognized source)
- ➔ Effectiveness profile: high precision, high recall on topic
- ➔ Stance balance: guaranteed
- ➔ Efficiency: high

Acquisition Paradigms

(c) ArgumenText [Demo]



- ❑ Research focus: argument mining
- ❑ Supervision level: low
- ➔ Effectiveness profile: low precision, high recall
- ➔ Stance balance: cannot be guaranteed
- ➔ Efficiency: low

Ranking Paradigms

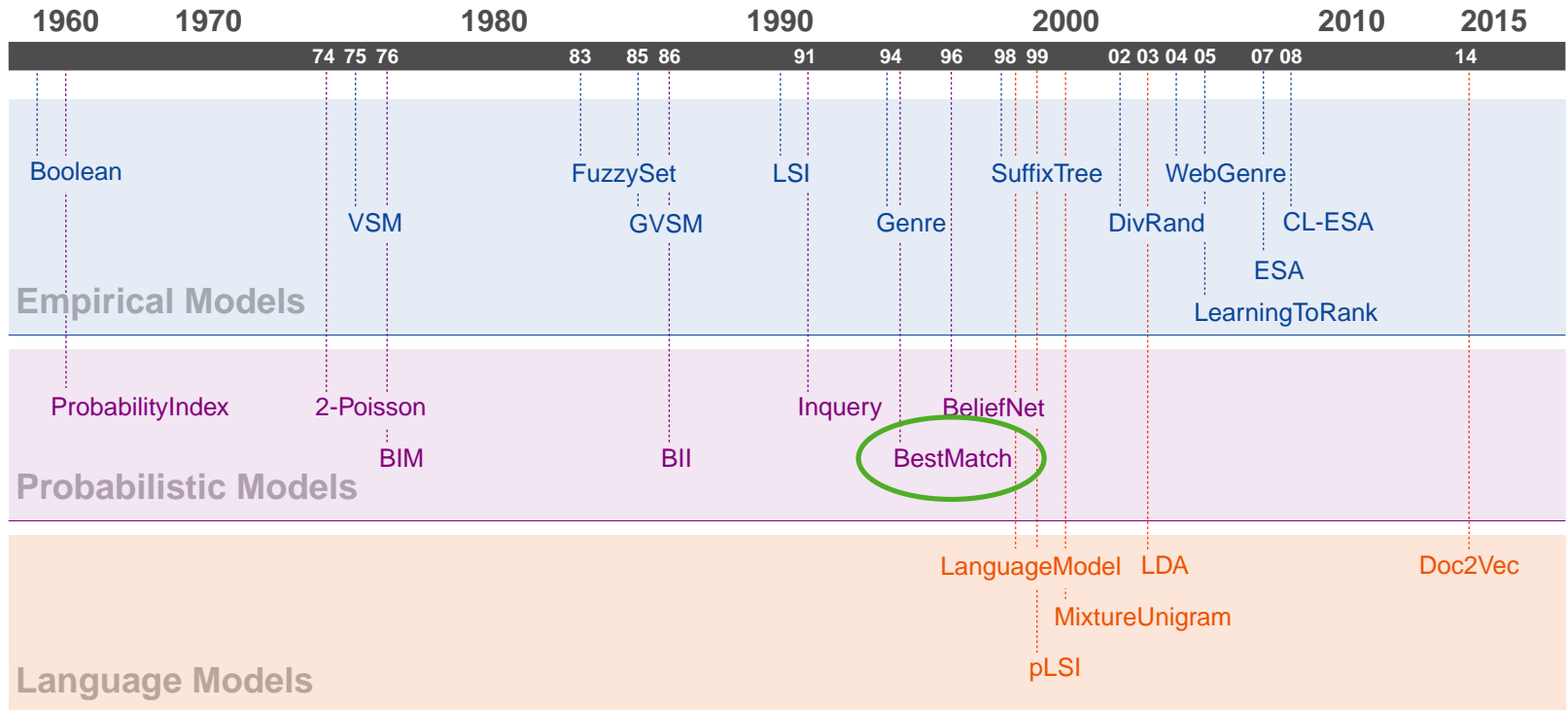


Designing a ranking algorithm:

- ❑ Analyze conclusions, premises, or both?
- ❑ Use fulltext or elite terms only?
- ❑ Exploit metadata and sentiment?
- ❑ Analyze relations between arguments?

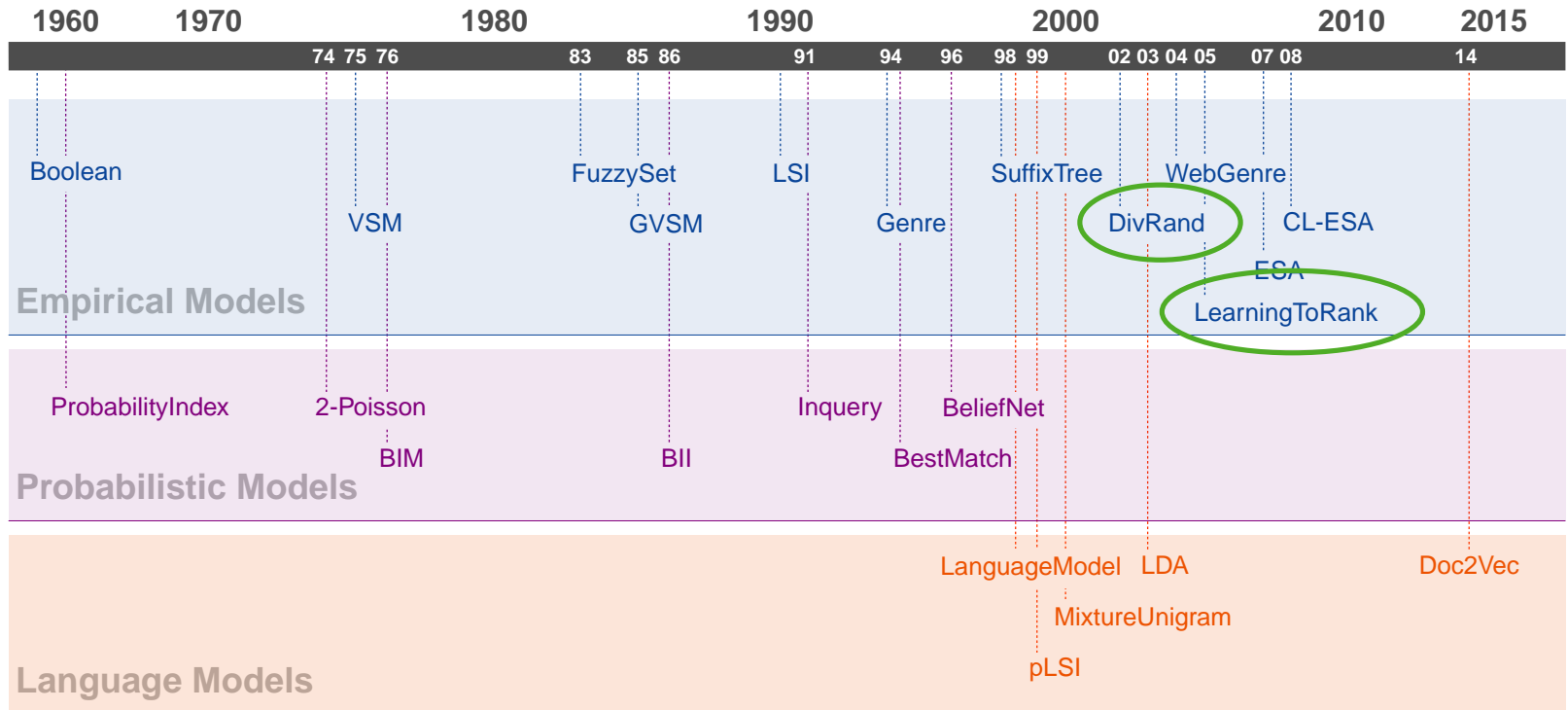
...

Ranking Paradigms in IR



$$\rho(q, A) \equiv \text{BM25}(q, A) = \sum_{i=1}^{|q|} \frac{\text{IDF}(t_i) \cdot \text{TF}(t_i, A) \cdot (k_1 + 1)}{\text{TF}(t_i, A) + k_1 \cdot (1 - b + b \cdot \frac{\text{LEN}(A)}{\text{avdl}})}$$

Ranking Paradigms in IR



- New research indicates that *Divergence from Randomness* and *Learning to Rank* are significantly more effective retrieval models to address Π_{rank} .

[Pottast et al., SIGIR 2019]

More on args.me [\[args.me\]](https://args.me)

Argument sources:

#	Debate Portal	Argument Units	Arguments	Debates
1	idebate.org	16 084	15 384	698
2	debatepedia.org	34 536	33 684	751
3	debatewise.org	39 576	33 950	2 252
4	debate.org	210 340	182 198	28 045
5	forandagainst.com	29 255	26 224	3 038
Σ		329 791	291 440	34 784

Design decisions:

- ❑ **Argument model:** conclusion + 1 premise with stance information
- ❑ **Query:** free text phrase, interpreted as AND query
- ❑ **Retrieval:** exact matching against conclusion
- ❑ **Ranking:** BM25F based on conclusion (1.0), premise (0.5), and debate (0.2)

More on args.me [\[args.me\]](https://args.me)

Top queries (Sep.'17 – Apr.'19) :

	Query	Absolute	Relative
1	climate change	251	3.5%
2	feminism	193	2.7%
3	abortion	158	2.2%
4	trump	146	2.0%
5	brexit	128	1.8%
6	death penalty	73	1.0%
7	google	58	0.8%
8	vegan	57	0.8%
9	nuclear energy	56	0.8%
10	donald trump	47	0.7%

Coverage of 1082 [Wikipedia controversial issues](#) :

- ❑ 78% match with ≥ 1 argument
- ❑ 42% match with ≥ 1 conclusion

More on args.me [args.me]

Presentation and Analytics

args abortion

All Discussions People Pro vs. con view 9238 arguments retrieved in 1.0ms

PRO

[Abortion is the ending of pregnancy by the removal or...](#)
 ▶ Show full argument
Abortion is the ending of pregnancy by the removal or forcing out from the womb of a fetus or embryo before it is able to survive on its own. An **abortion** can occur spontaneously, in which ...
<https://www.debate.org/debates/abortion/350/> score ▼

[Great, another forfeiter. As someone who has debated...](#)
 ▶ Show full argument
 Great, another forfeiter. As someone who has debated **abortion** before, I will put a link to my original **abortion** debate right here: <http://www.debate.org...> I will be using arguments that ...
<https://www.debate.org/debates/Abortion/328/> score ▼

[This should be fun :\) The legalisation of abortion has...](#)
 ▶ Show full argument
 This should be fun :) The legalisation of **abortion** has been a big issue worldwide for a long period of time, not only politically but also on social and religious fronts. **Abortion** can be ...
<https://www.debate.org/debates/Abortion/156/> score ▼

[There are many good and bad sides to abortion. But IUS...](#)
 ▶ Show full argument
 There are many good and bad sides to **abortion**. But just like everything, There is no black and white. Just a whole range of gray. **Abortion** is one way that poverty can decrease. Most unplanned ...
<https://www.debate.org/debates/Abortion/741/> score ▼

[Although I oppose abortion in most cases, I accepted this...](#)
 ▶ Show full argument
 Although I oppose **abortion** in most cases, I accepted this debate because Con's position is that **abortion** "can never be justified regardless of circumstances." That is the point I want to ...
<https://www.debate.org/debates/abortion/899/> score ▼

[Abortion is needed to control the population so that the...](#)
 ▶ Show full argument
Abortion is needed to control the population so that the population doesn't get too excess. By the 22 century, the population estimated to be 11.2 billion people and if **abortion** were illegal, ...
<https://www.debate.org/debates/Abortion/543/> score ▼

CON

[In 2011 there were about 730,322 abortions reported to...](#)
 ▶ Show full argument
 In 2011 there were about 730,322 abortions reported to the centers for disease control. There are about 1.7% of **abortion** of women's ages from 15-44 each year. Women who already had **abortion** ...
<https://www.debate.org/debates/Abortion/545/> score ▼

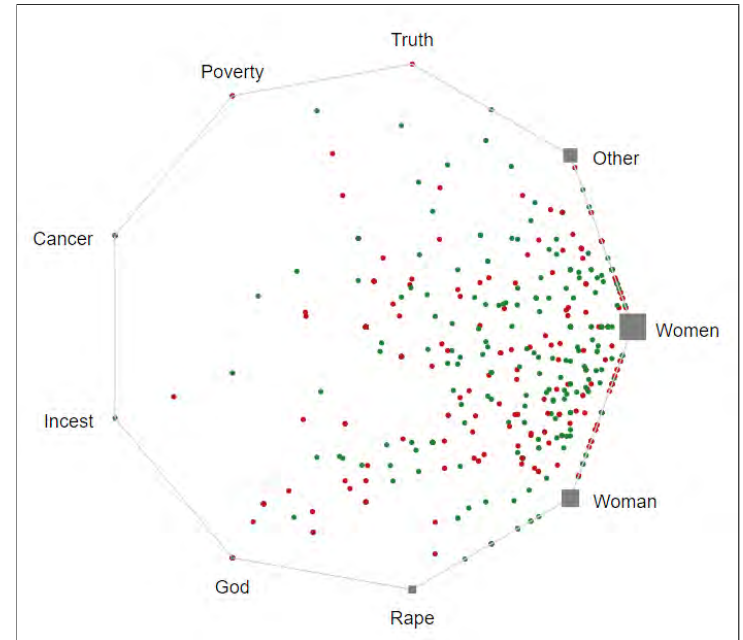
[The greatest destroyer of peace is abortion because if a...](#)
 ▶ Show full argument
 "The greatest destroyer of peace is **abortion** because if a mother can kill her own child, what is left for me to kill you and you to kill me? There is nothing between." says Mother Teresa ...
<https://www.debate.org/debates/Abortion/507/> score ▼

[Yes the government has the obligation to protect the...](#)
 ▶ Show full argument
 Yes the government has the obligation to protect the rights of people, in general. Women have a right to decide whether and when to become a parent. But not **abortion**. It's an ending life ...
<https://www.debate.org/debates/abortion/348/> score ▼

[Thank you, Pro. Negative CaseA1: False equivalenceln the...](#)
 ▶ Show full argument
 Thank you, Pro. Negative CaseA1: False equivalenceln the first round, in order to clarify the single word "**abortion**" into a resolution, my opponent elaborates: "**if abortion** is murder, so ...
<https://www.debate.org/debates/Abortion/392/> score ▼

[Abortion is wrong! Abortion Is gross! Abortion is ...](#)
Abortion is wrong! **Abortion** is gross! **Abortion** is MURDER!!!!
 Attacks: **Abortion**
<https://www.debate.org/debates/Abortion/468/> score ▼

[Thank you to both the audience and my opponent for yet...](#)
 ▶ Show full argument
 Thank you to both the audience and my opponent for yet another debate on **abortion**. The resolution is simply "**Abortion**" and my opponent has stated that he supports the affirmative. I shall ...
<https://www.debate.org/debates/Abortion/331/> score ▼



More on args.me [args.me]

Presentation and Analytics

args abortion

All Discussions People Pro vs. con view 9238 arguments retrieved in 1.0ms

PRO

[Abortion is the ending of pregnancy by the removal or...](#)
 ▶ Show full argument
Abortion is the ending of pregnancy by the removal or forcing out from the womb of a fetus or embryo before it is able to survive on its own. An **abortion** can occur spontaneously, in which ...
<https://www.debate.org/debates/Abortion/350/> score ▼

[Great, another forfeiter. As someone who has debated...](#)
 ▶ Show full argument
 Great, another forfeiter. As someone who has debated **abortion** before, I will put a link to my original **abortion** debate right here: <http://www.debate.org...> I will be using arguments that ...
<https://www.debate.org/debates/Abortion/328/> score ▼

[This should be fun :\) The legalisation of abortion has...](#)
 ▶ Show full argument
 This should be fun :) The legalisation of **abortion** has been a big issue worldwide for a long period of time, not only politically but also on social and religious fronts. **Abortion** can be ...
<https://www.debate.org/debates/Abortion/156/> score ▼

[There are many good and bad sides to abortion. But IUS...](#)
 ▶ Show full argument
 There are many good and bad sides to **abortion**. But just like everything, There is no black and white. Just a whole range of gray. **Abortion** is one way that poverty can decrease. Most unplanned ...
<https://www.debate.org/debates/Abortion/741/> score ▼

[Although I oppose abortion in most cases, I accepted this...](#)
 ▶ Show full argument
 Although I oppose **abortion** in most cases, I accepted this debate because Con's position is that **abortion** "can never be justified regardless of circumstances." That is the point I want to ...
<https://www.debate.org/debates/abortion/899/> score ▼

[Abortion is needed to control the population so that the...](#)
 ▶ Show full argument
Abortion is needed to control the population so that the population doesn't get too excess. By the 22 century, the population estimated to be 11.2 billion people and if **abortion** were illegal, ...
<https://www.debate.org/debates/Abortion/543/> score ▼

CON

[In 2011 there were about 730,322 abortions reported to...](#)
 ▶ Show full argument
 In 2011 there were about 730,322 abortions reported to the centers for disease control. There are about 1.7% of **abortion** of women's ages from 15-44 each year. Women who already had **abortion** ...
<https://www.debate.org/debates/Abortion/545/> score ▼

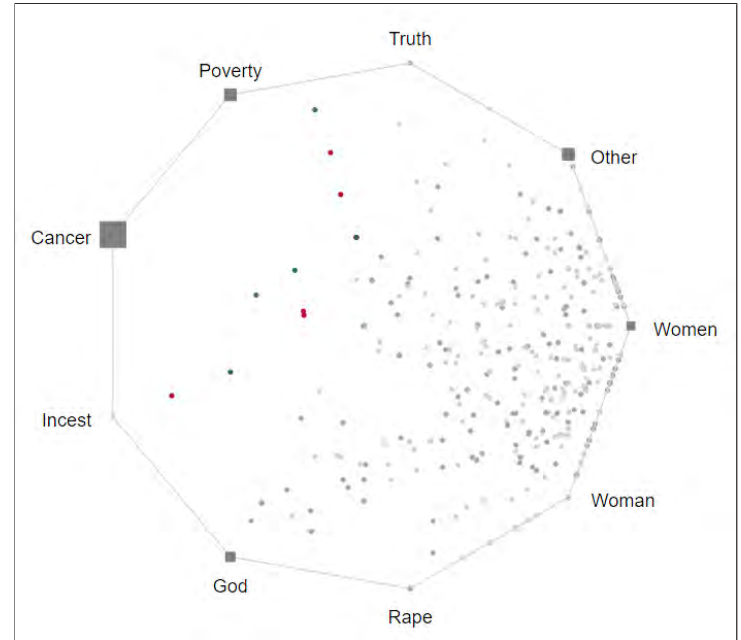
[The greatest destroyer of peace is abortion because if a...](#)
 ▶ Show full argument
 "The greatest destroyer of peace is **abortion** because if a mother can kill her own child, what is left for me to kill you and you to kill me? There is nothing between." says Mother Teresa ...
<https://www.debate.org/debates/Abortion/507/> score ▼

[Yes the government has the obligation to protect the...](#)
 ▶ Show full argument
 Yes the government has the obligation to protect the rights of people, in general. Women have a right to decide whether and when to become a parent. But not **abortion**. It's an ending life ...
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<https://www.debate.org/debates/Abortion/331/> score ▼



More on args.me [\[args.me\]](https://args.me)

Presentation and Analytics

The screenshot shows the args.me website interface for a discussion on "abortion". At the top, there is a search bar and navigation links for "All Discussions" and "People". Below the search bar, there are filters for "Any age", "Any gender", "Any nationality", and "Any reputation". The main content area is divided into two columns: "PRO" and "CON".

PRO

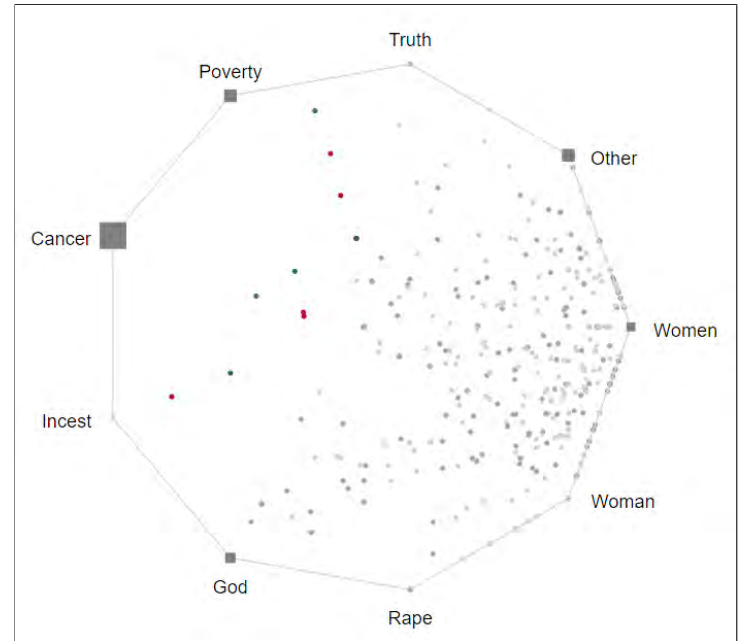
This Friday, Canada will undergo its third universal
Irene Mathysseon • New Democratic Party
▶ Show full argument
This Friday, Canada will undergo its third universal periodic review at the United Nations. This is an important moment when Canada will be held accountable by other UN member states on ...
score -

CON

It has been 29 years since abortion was legalized in this
Eric C. Lowther • Reform
▶ Show full argument
It has been 29 years since **abortion** was legalized in this country. In those days **abortion** was used only where a mother's life or health was endangered. But today I think it has gone too ...
score -

January 28 was the 20th anniversary of the Supreme Court...
Irene Mathysseon • New Democratic Party
▶ Show full argument
January 28 was the 20th anniversary of the Supreme Court of Canada's Morgentaler decision, which decriminalized **abortion** in Canada. The legal decision was a victory for Canadian women ...
score -

At the bottom of the page, there are links for "Terms", "API", and "About", along with a copyright notice: "Copyright © 2019 Webis Group. Contact Impressum / Privacy Policy".



Take Home Messages

3.4 Argument Search Engines

- ❑ from “what” search engines to “why” search engines
- ❑ acquisition paradigm trades precision, recall, and topicality

3.1 Argument Retrieval Problems

3.2 Argument Ranking

3.3 Resources

3.4 Argument Search Engines

3.5 Shared Tasks

Same Side Stance Classification [\[sameside.webis.de\]](http://sameside.webis.de)

Task: Given two arguments regarding a certain topic, decide whether or not the two arguments have the same stance.

Topic: "Gay marriage should be legalized."

Argument 1

Marriage is a commitment to love and care for your spouse till death. This is what is heard in all wedding vows. Gays can clearly qualify for marriage according to these vows, and any definition of marriage deduced from these vows.

Argument 2

Marriage is the institution that forms and upholds for society, its values and symbols are related to procreation. To change the definition of marriage to include same-sex couples would destroy its function.

○≠○
different
side

Argument 1

Marriage is a commitment to love and care for your spouse till death. This is what is heard in all wedding vows. Gays can clearly qualify for marriage according to these vows, and any definition of marriage deduced from these vows.

Argument 2

Gay marriage should be legalized since denying some people the option to marry is discriminatory and creates a second class of citizens.

○=○
same
side

Same Side Stance Classification

Task Rationale

Same side classification needs not to distinguish topic-specific pro- / con-vocabulary.

- "Only" argument similarity within a stance needs to be assessed.
- Same side classification may be solved in a **topic-agnostic** fashion.

Applications:

- measure the bias strength within argumentation
- structure a discussion
- find out who or what is challenging me in a discussion
- filter wrongly labeled stances in a large argument corpus
- ...

Same Side Stance Classification

Tasks Details

Two topics (domains):

1. Should gay marriage be legalized?
2. Should abortion be legalized?

Within domain setting:

Training. Instances from both domains.

Test. Instances from both domains.

Cross domain setting:

Training. Instances from abortion.

Test. Instances from gay marriage.

Form of an instance:

1. Name of the topic (domain) d .
2. Argument 1 from \mathbb{A}_d .
3. Argument 2 from \mathbb{A}_d .
4. One of $\{ \circ = \circ, \circ \neq \circ \}$.

Timeline:

- 8.6. 2019: Training data online.
- 14.6. 2019: Submission open.
- 21.7. 2019: Submission closed.
- 1.8. 2019: 6th ArgMining workshop.

Same Side Stance Classification

Results “Within Domain”

Team	Gay marriage			Abortion			All		
	Pre	Rec	Acc	Pre	Rec	Acc	Pre	Rec	Acc
Trier University	0.90	0.73	0.83	0.79	0.59	0.71	0.85	0.66	0.77
Leipzig University	0.80	0.78	0.79	0.78	0.68	0.75	0.79	0.73	0.77
IBM Research	0.73	0.63	0.70	0.64	0.54	0.62	0.69	0.59	0.66
TU Darmstadt	0.74	0.56	0.68	0.63	0.48	0.60	0.68	0.52	0.64
Düsseldorf University	0.76	0.35	0.62	0.65	0.32	0.57	0.70	0.33	0.60
LMU	0.53	1.00	0.55	0.53	1.00	0.55	0.53	1.00	0.55
...									

Same Side Stance Classification

Results “Cross Domain”: Abortion → Gay marriage

Team	Gay marriage (large)			Gay marriage (small)		
	Pre	Rec	Acc	Pre	Rec	Acc
LMU	0.67	0.53	0.63	0.78	0.61	0.72
TU Darmstadt	0.64	0.59	0.63	0.71	0.63	0.68
IBM Research	0.62	0.49	0.60	0.74	0.43	0.64
Paderborn University	0.60	0.38	0.56	0.79	0.33	0.62
Trier University	0.69	0.16	0.54	1.00	0.20	0.60
Düsseldorf University	0.72	0.53	0.66	0.68	0.37	0.60
...						

Most of the submitted classifiers are robust regarding:

- imbalances between domain proportions in training and test
- imbalances between domain proportions within test
- imbalances between same side / different side proportions

Argument Retrieval Task @ CLEF 2020

[\[touche.webis.de\]](http://touche.webis.de)

Argument Retrieval Task @ CLEF 2020 [\[touche.webis.de\]](http://touche.webis.de)

Task 1: Supporting argumentative conversations

- ❑ Scenario: Users search for arguments on controversial topics
- ❑ Task: Retrieve “strong” pro/con arguments on the topic
- ❑ Data: 300,000 “arguments” (short text passages)

Task 2: Answering comparative questions with arguments

- ❑ Scenario: Users face personal decisions from everyday life
 - ❑ Task: Retrieve arguments for “Is X better than Y for Z?”
 - ❑ Data: ClueWeb12 or ChatNoir [\[chatnoir.eu\]](http://chatnoir.eu)
-
- ❑ Run submissions similar to “classical” TREC tracks
 - ❑ Software submissions via TIRA [\[tira.io\]](http://tira.io)

Touché @ CLEF 2020

1st Shared Task on Argument Retrieval

Alexander Bondarenko
Matthias Hagen
Martin Potthast
Henning Wachsmuth
Meriem Beloucif
Chris Biemann
Alexander Panchenko
Benno Stein



Take Home Messages

3.5 Shared Tasks

- ❑ build community for relevant problems
- ❑ acquire knowledge and best practices, improve benchmarks

Summary

3.1 Argument Retrieval Problems

basic argument model, relevant retrieval problems

3.2 Argument Ranking

topic-agnostic solution for Π_{rank} and Π_{counter}

3.3 Resources

resources: tools, corpora, debates, discussions, argumentative texts

3.4 Argument Search Engines

acquisition paradigm trades between precision, recall, and topicality

3.5 Shared Tasks

build community, acquire knowledge, improve benchmarks