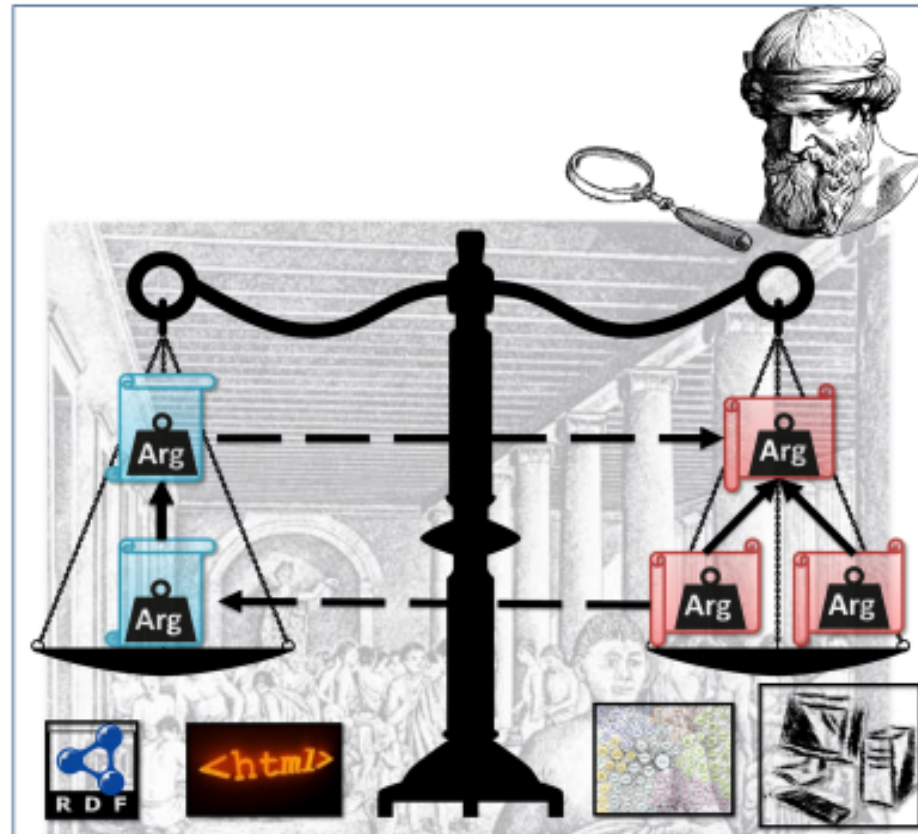


Machine-Interpretable Online Debates

The vision of a new Web Paradigm



Antonis Bikakis

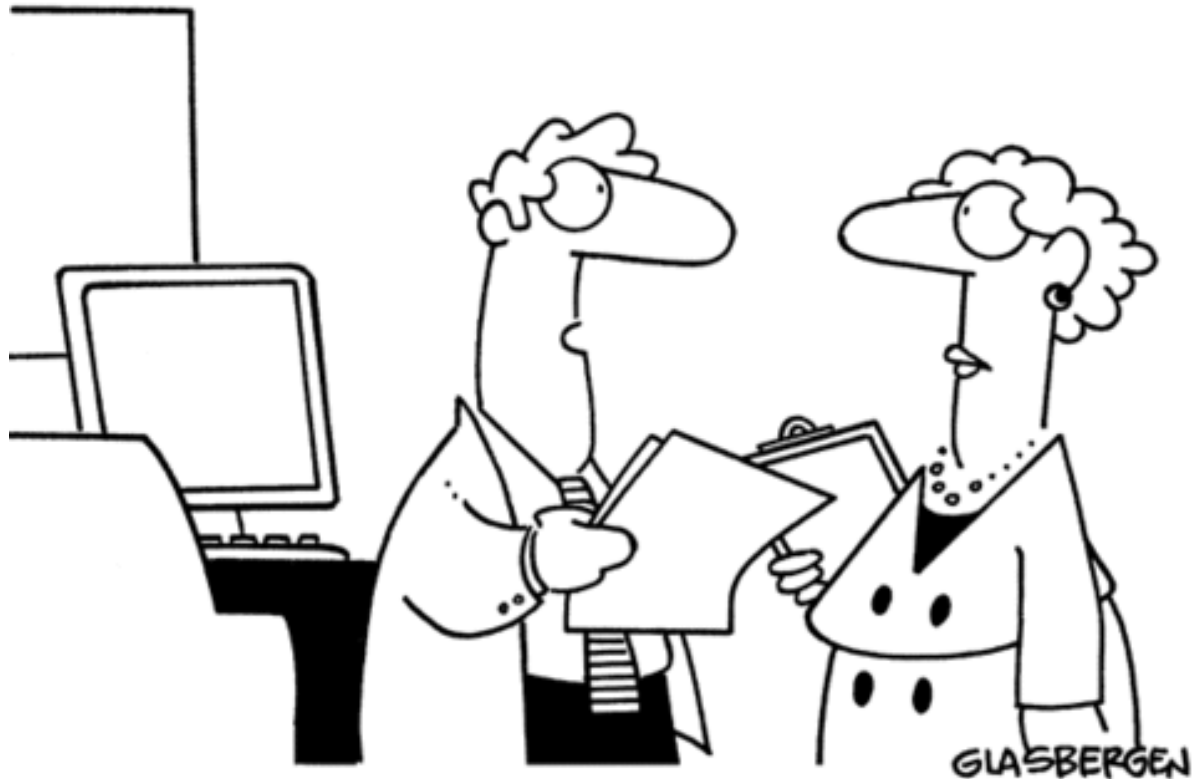
Department of Information Studies, UCL

Introduction

- A new activity (2 years)
 - Work on idea formulation
 - Mostly questions, few answers
- Participants
 - Researchers from different disciplines
 - Computer Science
 - Psychology
 - Language Sciences

What?

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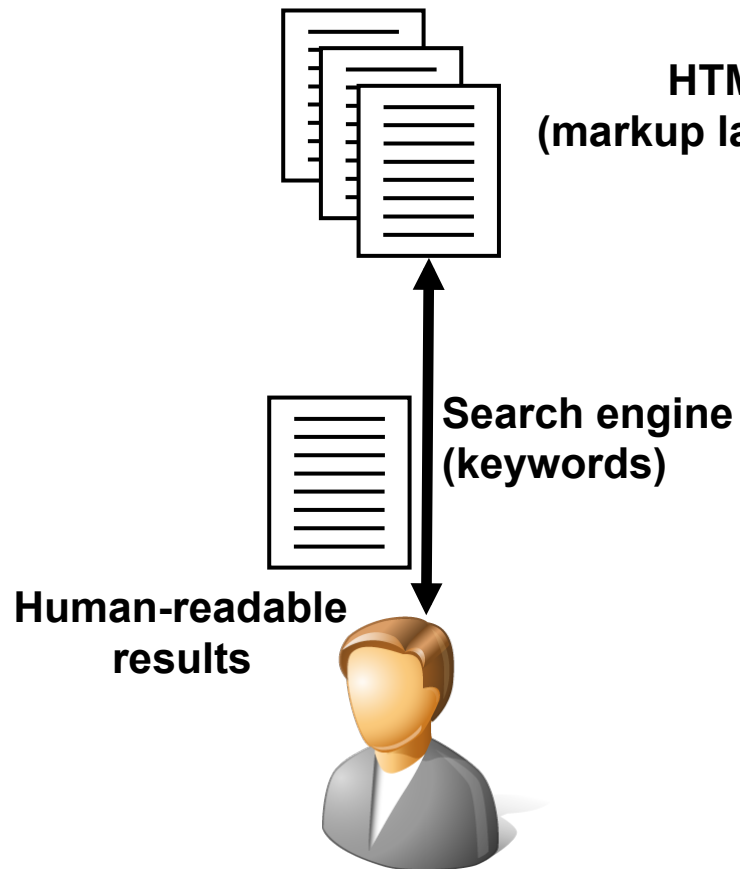
**“My team has created a very innovative solution,
but we’re still looking for a problem to go with it.”**

Main Idea

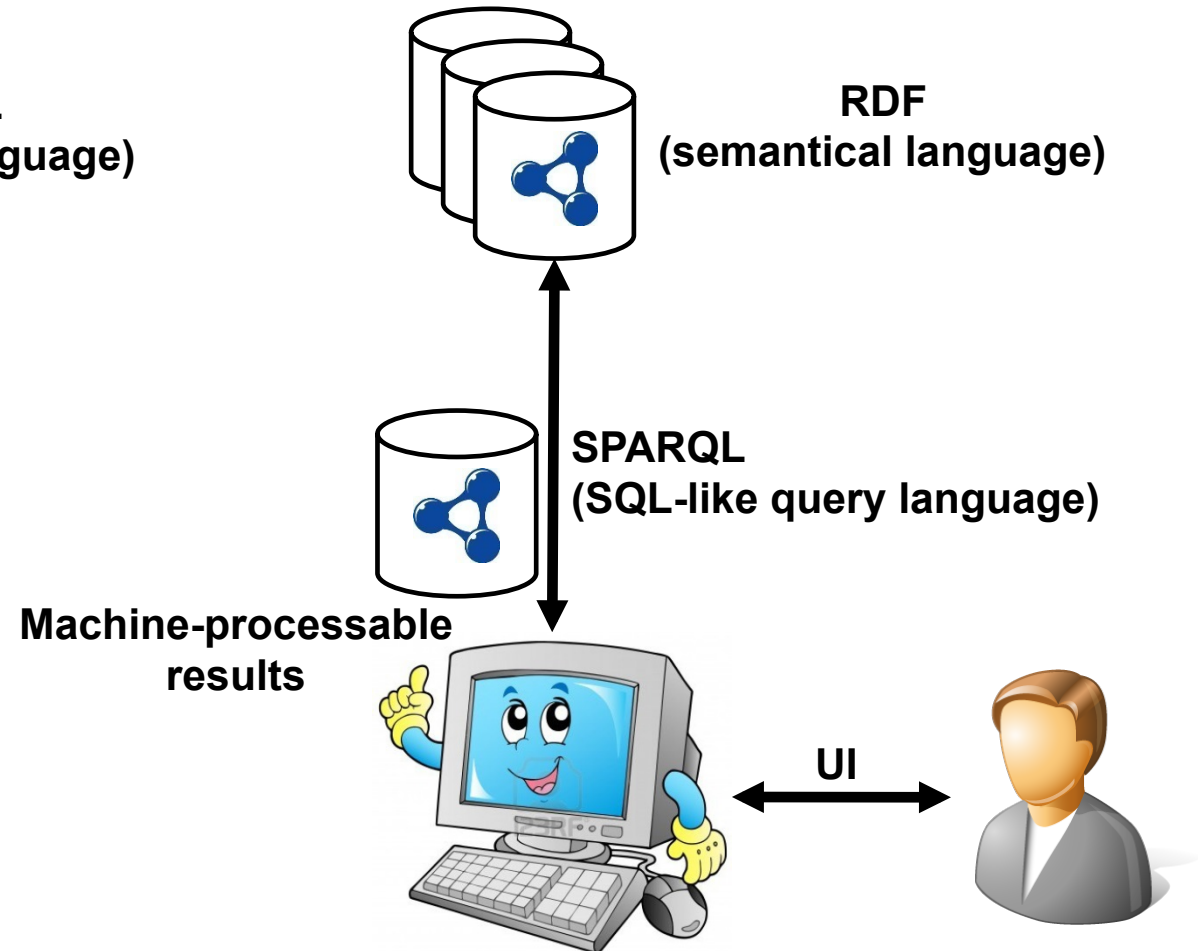
- Web users are increasingly using the Web to publicize their opinions, to comment on what others have said, to participate in discussions on any conceivable topic.
- However, this information is left unexploited mainly because of the textual form in which it is available.
- Aim: Develop computational models and tools for the analysis, interrelation, evaluation and exploration of online opinions, arguments and debates.

The Evolution of the Web

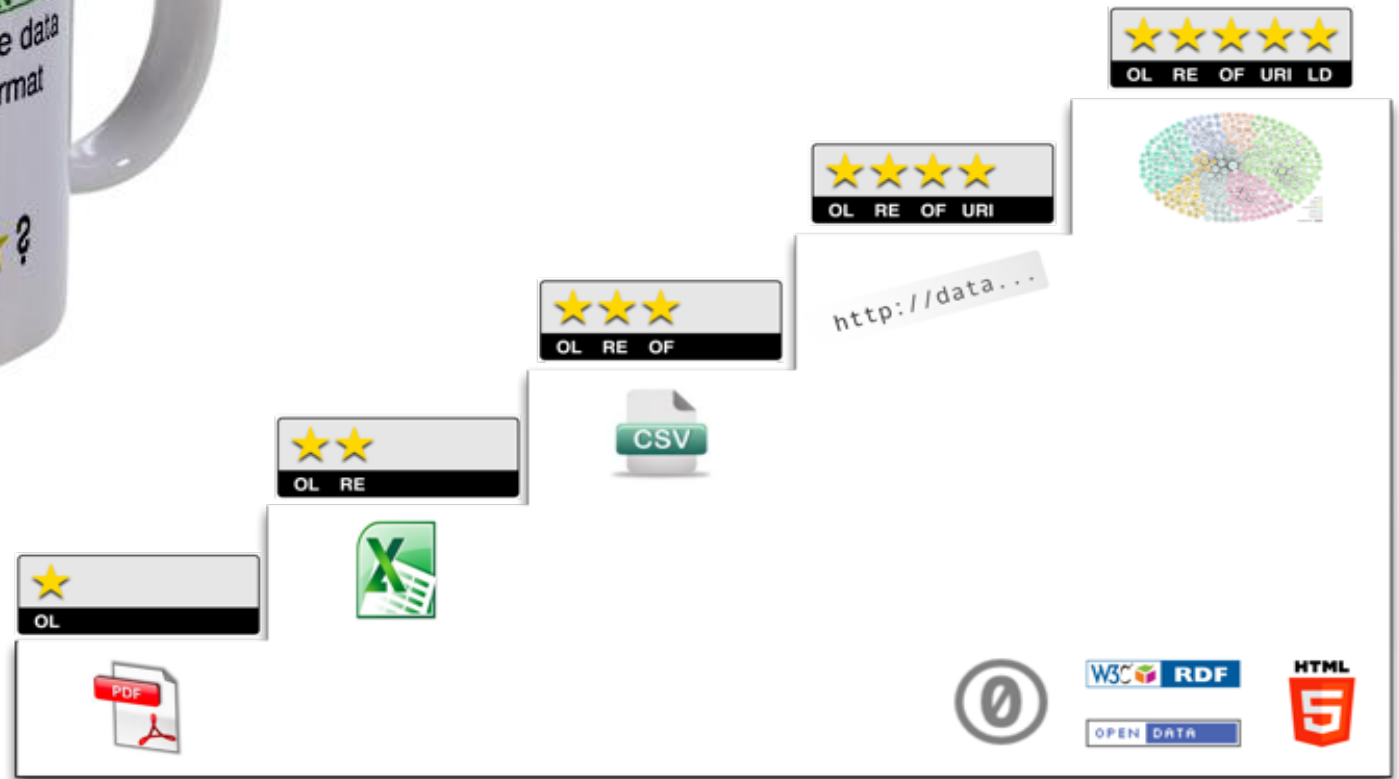
Web of Documents



Web of Data



From Documents to Linked Open Data



From a File System to a Database

- Web of Documents → a **global file system**
- Web of Data → a global **database**

Trend: Web Debates

- Social media (on posts and other content)
- Blogs (on posts)
- Wikis (on content)
- Government websites (on bills and regulations)
- Scientific journals (on articles, e.g., IEEE)
- Dedicated websites (on matters of general interest, e.g., debate.org)
- Resellers and e-shops (on products)
- Service providers (on services)
- News websites (for news articles)
- Forums (for consultation, criticism, discussion)

**Arguments and debates
are abundant in current Web**

**Discussions, debates, arguments,
comments, criticism**

... in review sites

Posted on 30 Jun 2015 10:20:15 BDT

Mrs. J. Davies says:

I have given very negative reviews, when deserved, I do try to give an honest opinion, and have never had one re

[Reply to this post](#)

Mr. D. James says:

I'd like to give negative feedback r
where?

[Reply to this post](#)

22 Jun 2015 15:18:12 BDT

I have been using Amazon for many years now and never had a problem. Earlier this year I wrote a fairly negative feedback regarding a sellers poor customer service. It never appeared on the site and I gave it no more thought, however, last week, I had cause once again to make give a product negative feedback and guess what - it's not there!. Strangely enough, all of my positive feedback seems to appear almost instantly. Has anyone else had the same issue?

Sam Mckissock

In reply to [an earlier post](#) on 9 Aug 2015 17:16:53 BDT

Andrew G Turner says:

Yes. I wrote reviem saying the product was great but advised against buying from Amazon as they were ok for cd's etc but not much else. I got a reply from Amazon saying it did not meet their guidelines!!!!

[Reply to this post](#)

[Permalink](#) | [Report abuse](#)

2 of 2 people think this post adds to the discussion. Do you?

... in news sites



Finite187 47m ago

2 ↑

"People voted no in the referendum but what did they get? In the end, they got a yes with more taxes, more cuts, because politicians in this country are worthless,"

No, you get more taxes and cuts because your government is broke after decades of overspending.

"All they do is execute the orders of foreigners who supposedly have saved us from the rocks [of insolvency]."

Yes, those foreigners did save you from insolvency. You think it's bad in Greece now, ask the Russians about debt default.

→ Reply

Report



thefuturebegins → **Finite187** 28m ago

1 ↑

Greece is going to default anyway. All Germany can do is stave this off for a few more years.

→ Reply

Report



chris1958 49m ago

3 ↑

I hope they vote convincingly for whoever wins. They need strong leadership.

... in social networks

 **zerohedge** @zerohedge 14h
What happens if the US enters a recession with the Fed already monetizing \$1 trillion per year? #fordschoolbernanke
Retweeted 59 times
Collapse Reply Retweet Favorite

59 RETWEETS	21 FAVORITES	
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3:26 PM - 14 Jan 13 - Details

 **Federal Reserve** @federalreserve 13h
What is the difference between monetary policy and fiscal policy, how are they related?: go.usa.gov/4rHw #fordschoolbernanke
Collapse Reply Retweet Favorite

23 RETWEETS	18 FAVORITES	
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3:47 PM - 14 Jan 13 - Details

 **tom keene** @tomkeene 14h
#fordschoolbernanke mr chairman, what did you learn from Ned Gramlich. @tomkeene Bloomberg News
Collapse Reply Retweet Favorite

6 RETWEETS	2 FAVORITES	
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3:16 PM - 14 Jan 13 - Details

 **GlobalMacroZen** @GlobalMacroZen 15h
What will be your exit strategy for the years to come to prevent inflation or do you think prayer helps? #fordschoolbernanke
Collapse Reply Retweet Favorite

19 RETWEETS	5 FAVORITES	
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2:31 PM - 14 Jan 13 - Details

 **Mark Dow** @mark_dow 20h
What are key elements in evolution of your thinking in structural vs cyclical issue? Thank you for your service #fordschoolbernanke
Collapse Reply Retweet Favorite

9:09 AM - 14 Jan 13 - Details

 **Jim Grant** @GrantsPub 14h
Could you help me understand the difference between central banking and price fixing? #fordschoolbernanke
Collapse Reply Retweet Favorite

32 RETWEETS	10 FAVORITES	
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3:24 PM - 14 Jan 13 - Details

... in debate sites



Does the European Union lack a shared European political culture?



The European Union lacks a shared European political culture. Although the European Union has had a lot of successes, there remain large differences in the political cultures of the different members. These different standards are one reason for the current economic crisis in Europe. Unfortunately, the nations will never be able to agree on important issues because of these differences.

Report Post

Like Reply

0 0

There is a European Political Culture Of course there will be infighting and compromises that need to be made, but there is certain amount of collective political identity that much of the European Union shares. The European Union does have some policies such as health care, military policies, etc that most of the EU share which help create a common political culture.

Report Post

Like Reply

0 0

From Facts to Arguments

- Web of Documents → a global **file system**
- Web of Data → a global **database**
- Our proposal → a global **repository of realistic arguments and opinions**

How?



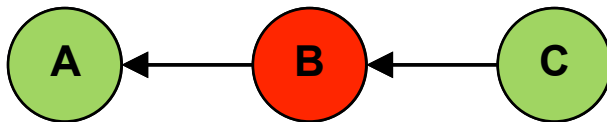
Argumentation Systems

- **Argumentation Theory**
 - how conclusions can be reached through logical reasoning
- **Argumentation Systems**
 - Computational systems that implement this reasoning process
 - model arguments, relationships among arguments, any other information related to arguments
 - compute conclusions based on the available arguments

Abstract Argumentation Framework

(Dung, 1995)

- $AF = (AR, attacks)$
 - AR : arguments
 - $attacks$: binary relation over arguments



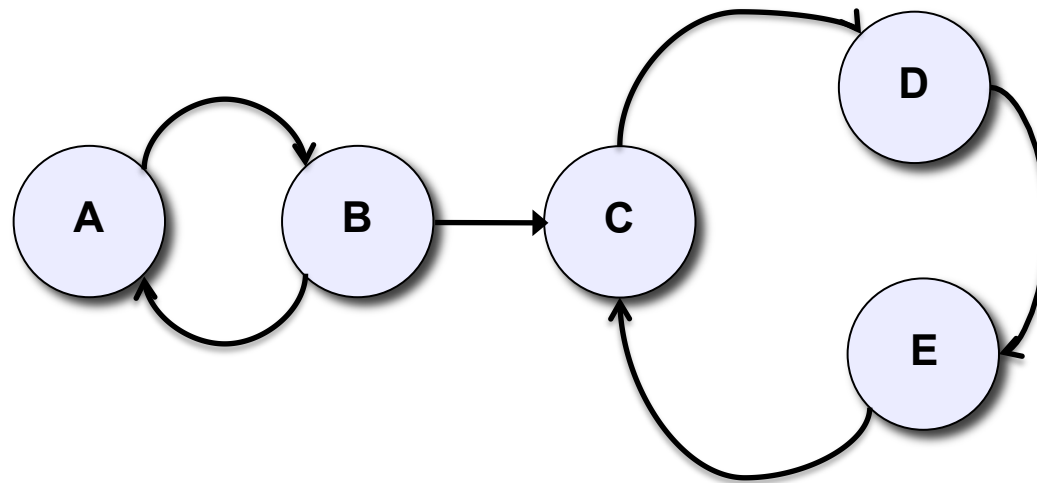
- Acceptability of arguments (here, A, C)
 - C is not attacked
 - A is attacked but its attacker is also attacked

Acceptability Semantics

Justifiable arguments

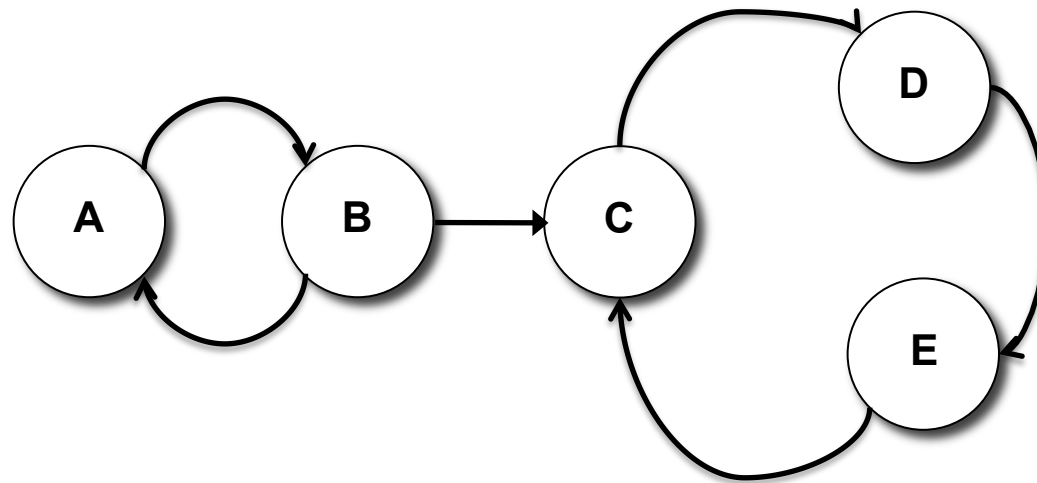
- Subset, S of AR which is *conflict free* (no argument in S attacks any other argument in S) and
 - **Admissible** – S attacks all its attackers.
 - **Complete** – S is admissible and contains all the arguments that it defends.
 - **Grounded** – S is the smallest complete set.
 - **Preferred** – S is the largest admissible set.
 - **Stable** – S attacks $AR-S$.
 - ...

Acceptability Semantics



Acceptability Semantics

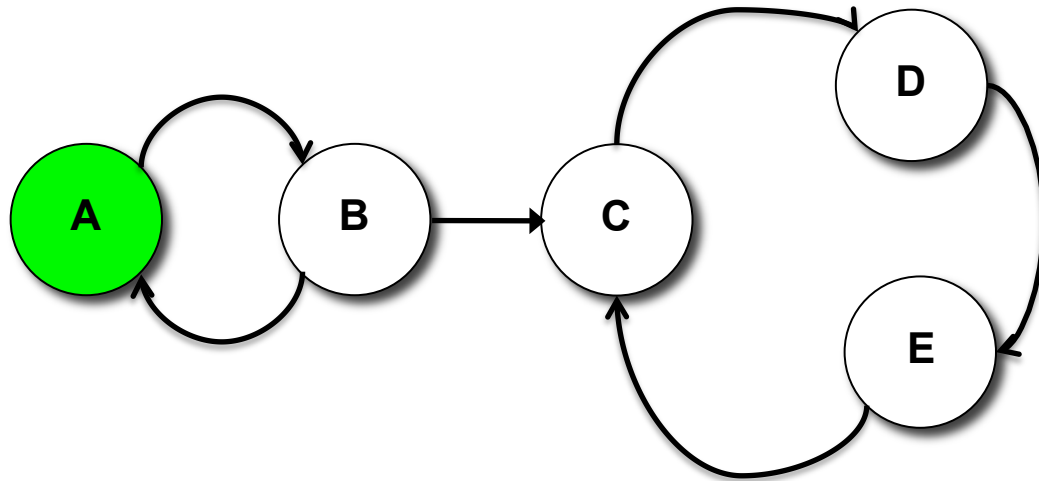
$S = \{\}$



Complete: *S is conflict-free and contains all the arguments that it defends*

Acceptability Semantics

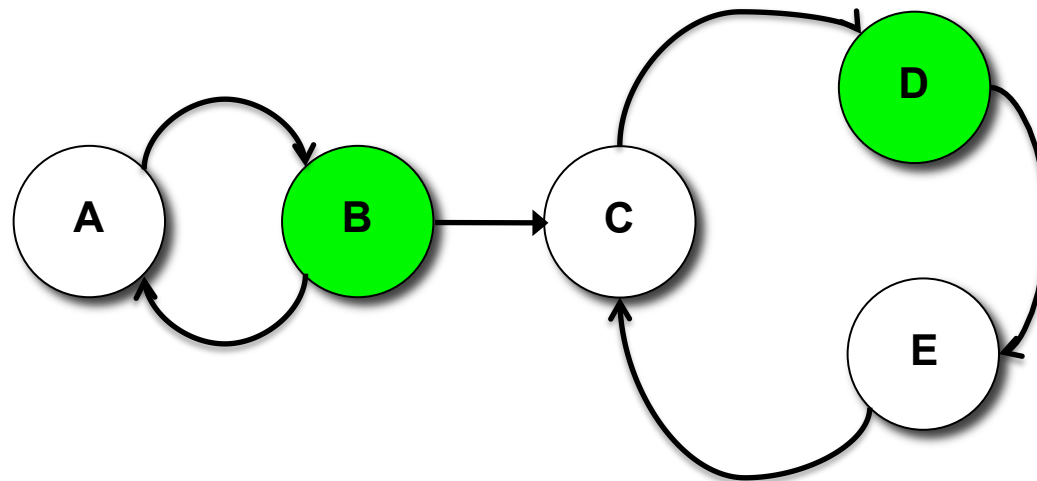
$S = \{A\}$



Complete: *S is conflict-free and contains all the arguments that it defends*

Acceptability Semantics

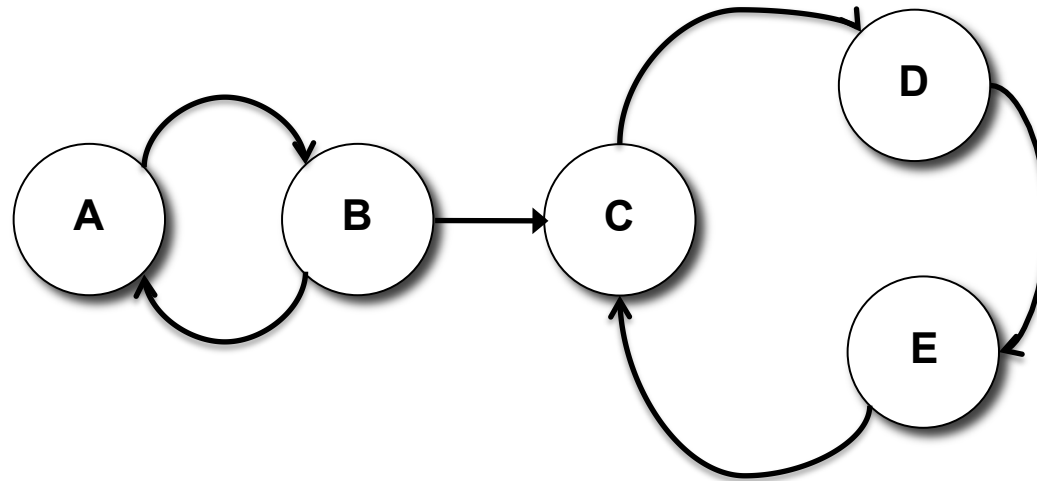
$S = \{B, D\}$



Complete: *S is conflict-free and contains all the arguments that it defends*

Acceptability Semantics

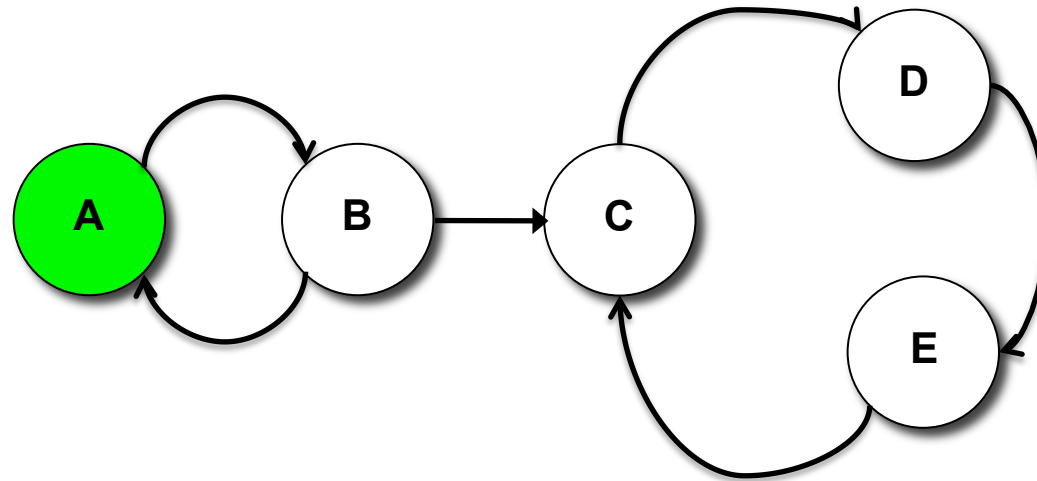
$S = \{\}$



Grounded: S is the smallest complete set

Acceptability Semantics

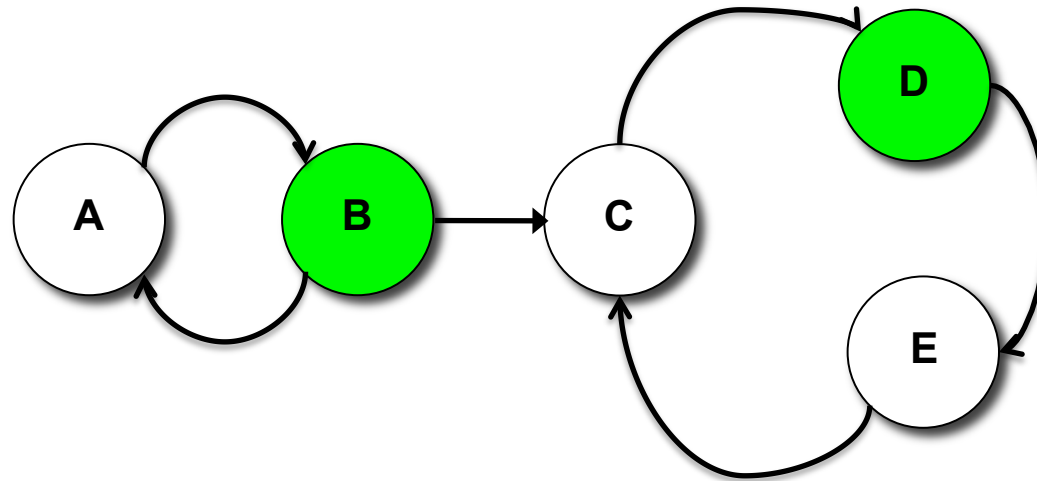
$S = \{A\}$



Preferred: S is the largest admissible set

Acceptability Semantics

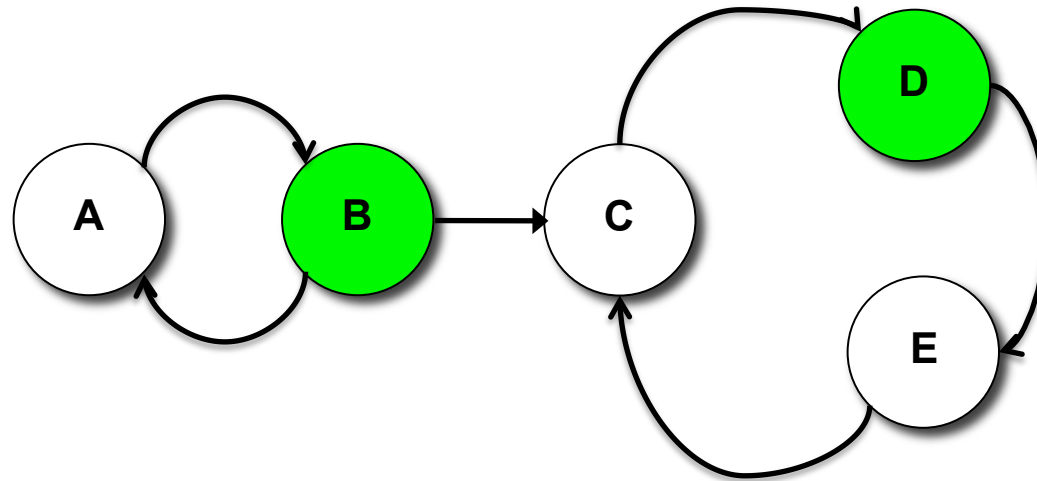
$S = \{B, D\}$



Preferred: S is the largest admissible set

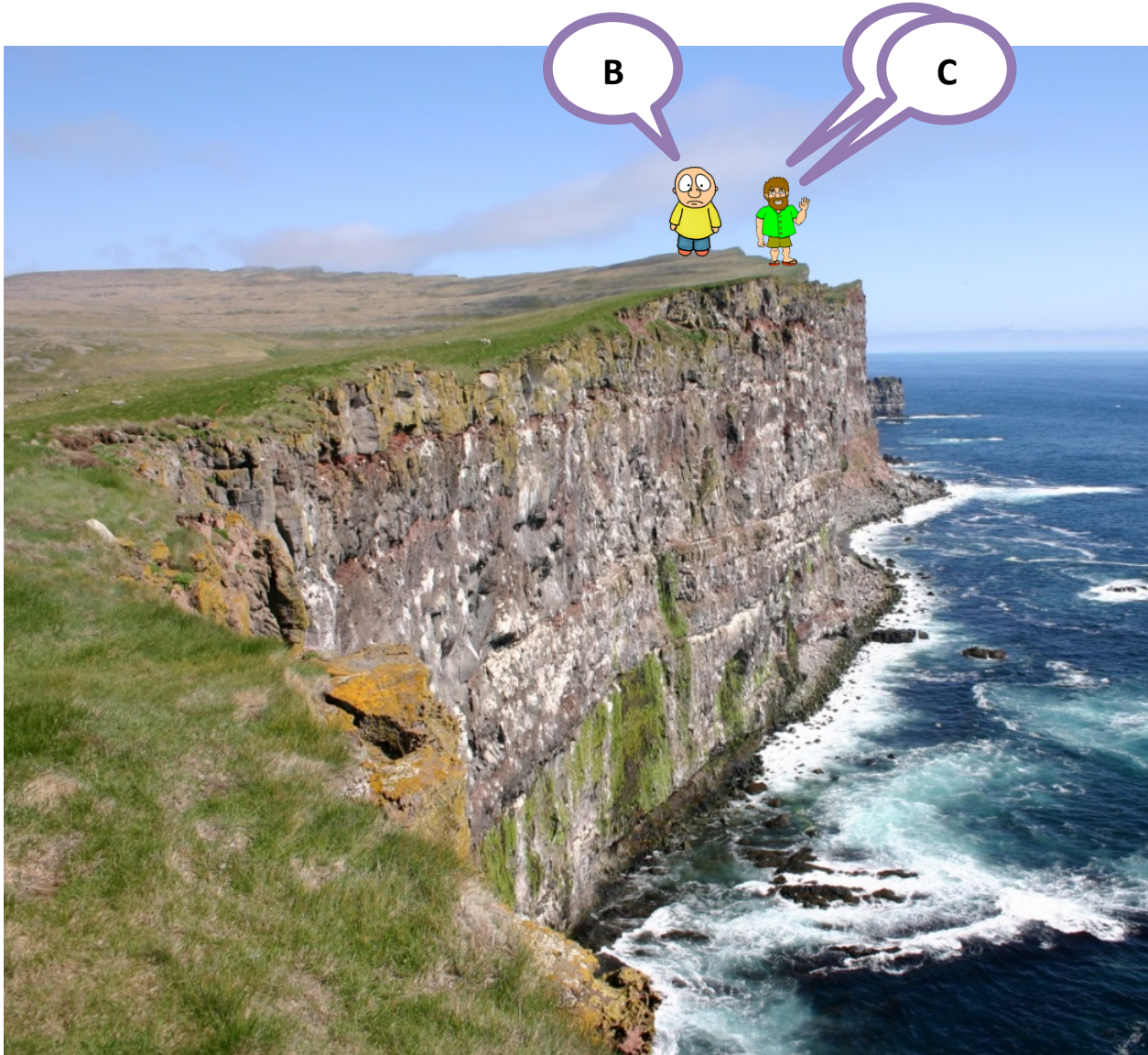
Acceptability Semantics

$S = \{B, D\}$



Stable: S is conflict-free and attacks $AR-S$

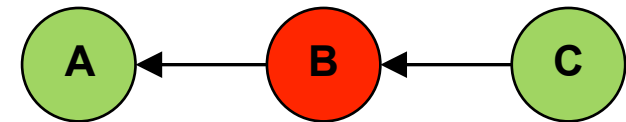
Dung's Framework: Problems



A: Free-falling is nice, so I will jump off the cliff

B: If you jump off the cliff, you will die

C: If I die, I will not go to work on Monday



Other Argumentation Systems

- Extensions of Dung's framework
 - preference-based, value-based, bipolar, context, social argumentation systems
- Arguments with Structure
 - ASPIC argumentation system
 - Defeasible Logic
 - Defeasible Logic Programming (DeLP)
 - Assumption-based Argumentation
- Logical vs. Realistic Argumentation
 - Motives, purpose (debates with a purpose)
 - Logos, ethos, pathos (Aristotle)

Realistic Argumentation

- Peer-pressure

- All my friends have a Facebook account
→ I should make a Facebook account

- Authority

- Scientists are 95% certain that humans are the “dominant cause” of global warming since the 1950s (source: IPCC, 5th assessment report)
→ global warming is man-made

- Emotions (threat, reward, fear, guilt)

- If you get a good degree, I’ll buy you a tablet
→ get a good degree

Argumentation Schemes

(Walton, 1996)

- **Argument from position to know**
 - **Major Premise:** Source a is in position to know about things in a certain subject domain S containing proposition p .
 - **Minor Premise:** a asserts that p is true (false)
 - **Conclusion:** p is true(false)
 - **Critical Questions:**
 - **CQ1:** Is a in position to know whether p is true (false)?
 - **CQ2:** Is a honest (trustworthy, reliable) source?
 - **CQ3:** Did a assert that p is true (false)?

Argumentation Schemes

(Walton, 1996)

- Appeal to Expert Opinion
- Appeal to Popular Opinion
- Argument from Analogy
- Argument from Correlation to Cause
- Argument from Positive / Negative Consequences
- Argument from Sign
- Argument from Commitment
- Ad Hominem Argument
- Argument from Verbal Classification

Audience and Persuasive Power

- Motives

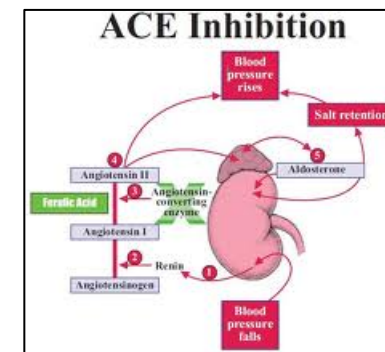
- Don't consume too much salt because it could increase blood pressure

- Hypertensive audience
- Hypotensive audience

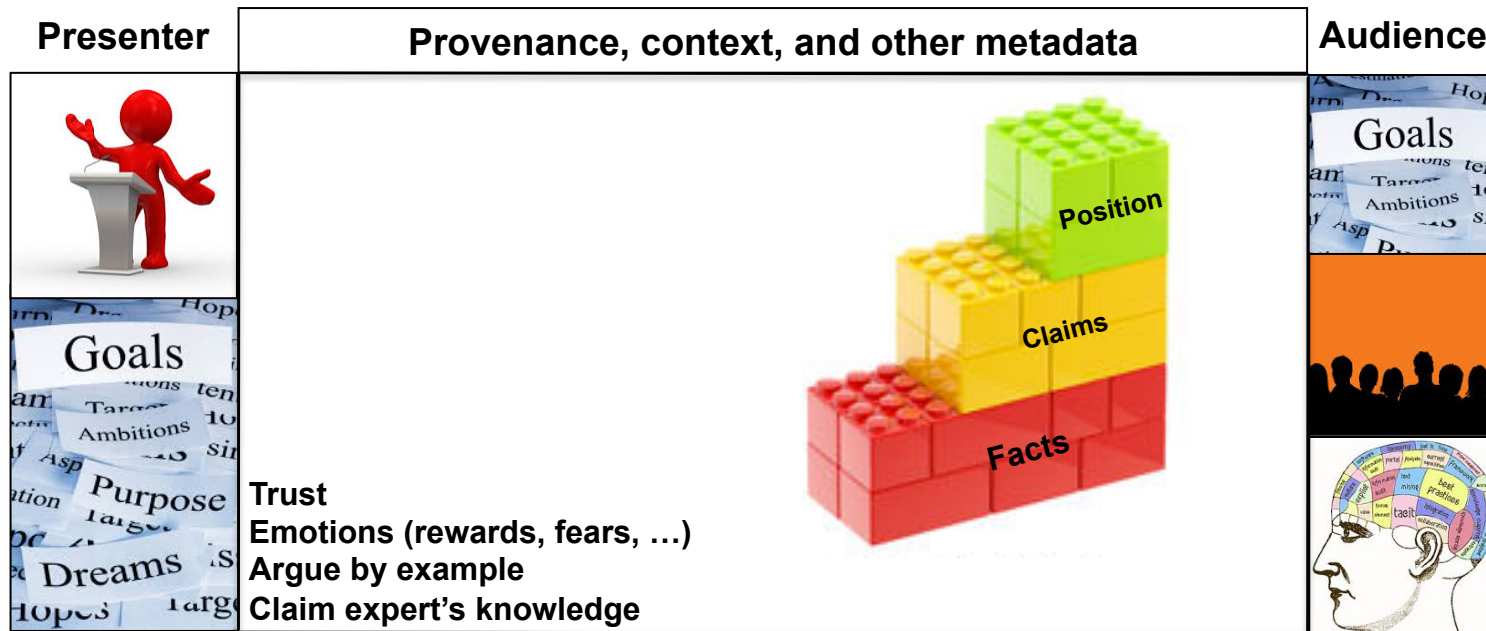


- Understanding

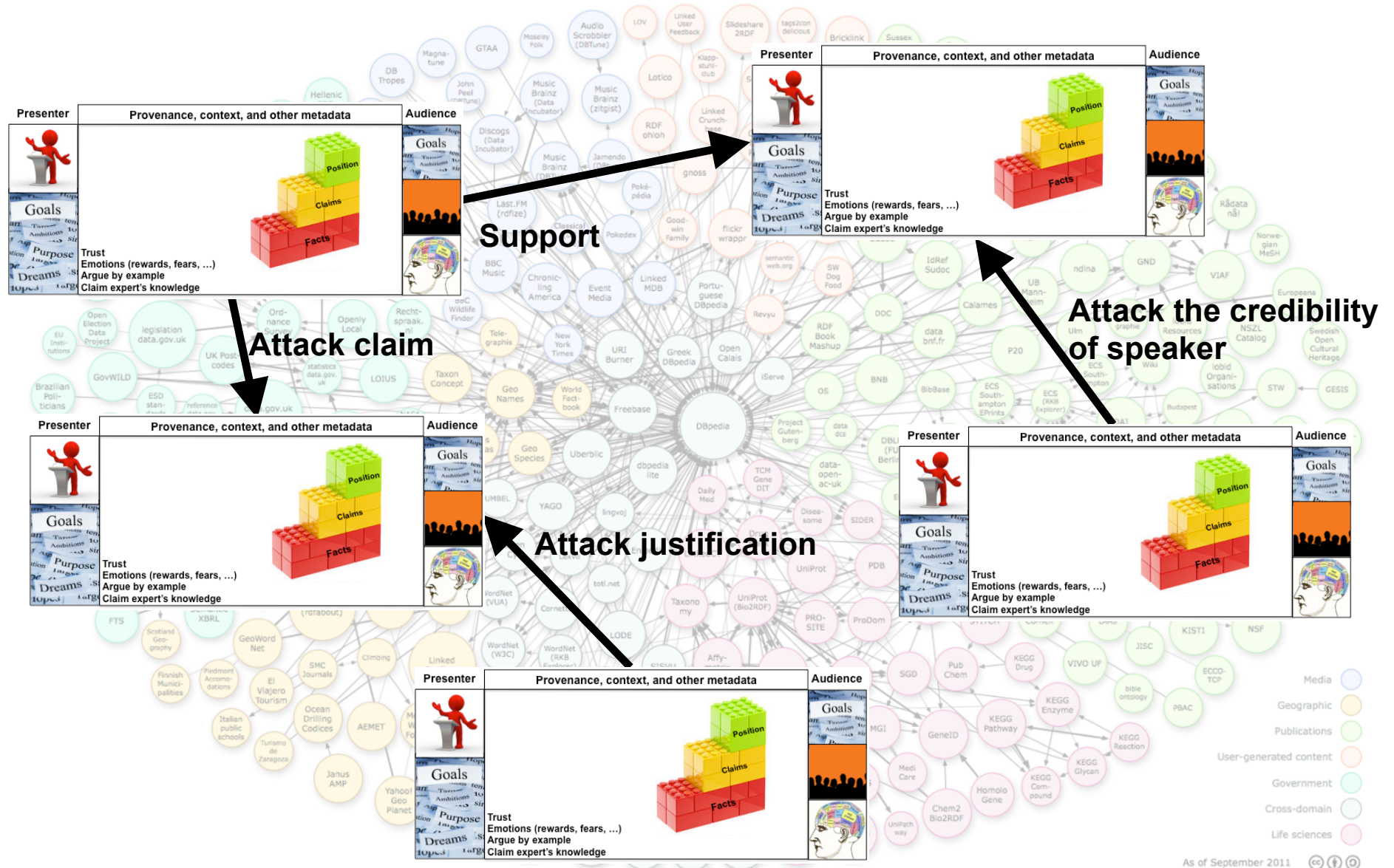
- The angiotensin-converting enzyme (ACE) inhibitors decrease the production of angiotensin and, in turn, that helps lower blood pressure → ACE inhibitors are good for lowering blood pressure



From Logical to Realistic Arguments

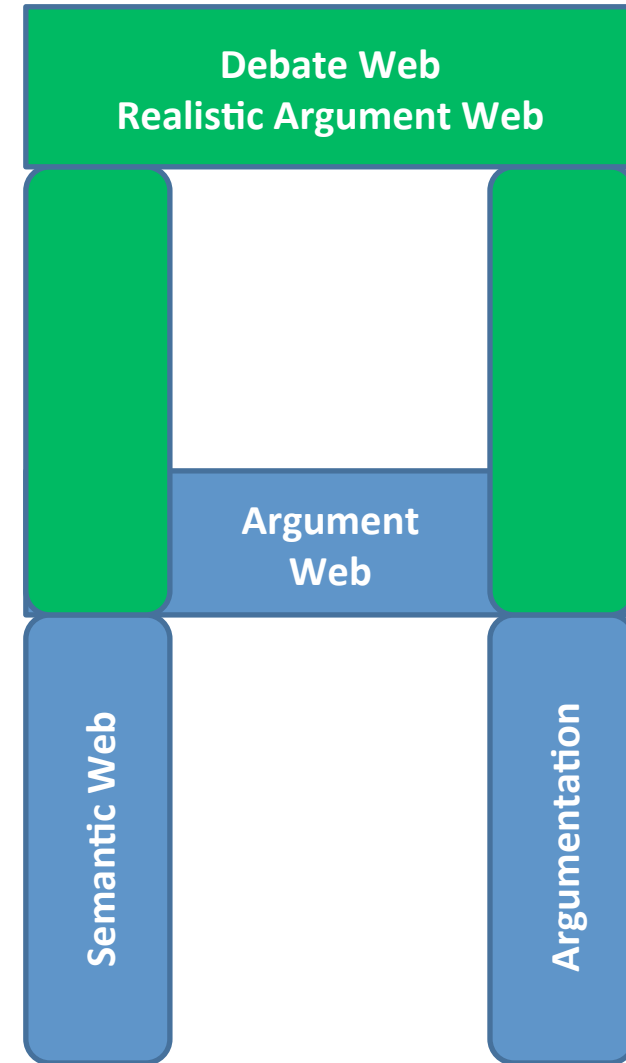


Web of (Realistic) Arguments



Useful Technologies

- **Computational Argumentation**
 - Persuasion
 - Walton's theories
- **(Semantic) Web Technologies**
 - Standard Web protocols
 - Semantic Web languages and tools
- **Argument Web Models and Tools**
 - Argument Interchange Format (AIF)
 - Argument visualization and analysis, argument blogging



Challenges



Understanding Realistic Debates

- **Realistic Argument**
 - What does it consist of?
 - How is it different to logical arguments?
- **Persuasive Power**
 - Audience, Context, Purpose, ...
 - Argument Relations
- **Logical vs. Realistic Argumentation**

Representation, Interchange and Storage

- **Semantically Explicit Representation Model**
 - Ontology for realistic arguments
 - Extend existing models (e.g. AIF)
 - Based on RDF
- **Realistic Argument Bases**
 - Storage, Inference Support, Query Support, Update, Repair and Change Monitoring, Information Propagation, Alignment
 - Analysis and Reasoning over Arguments

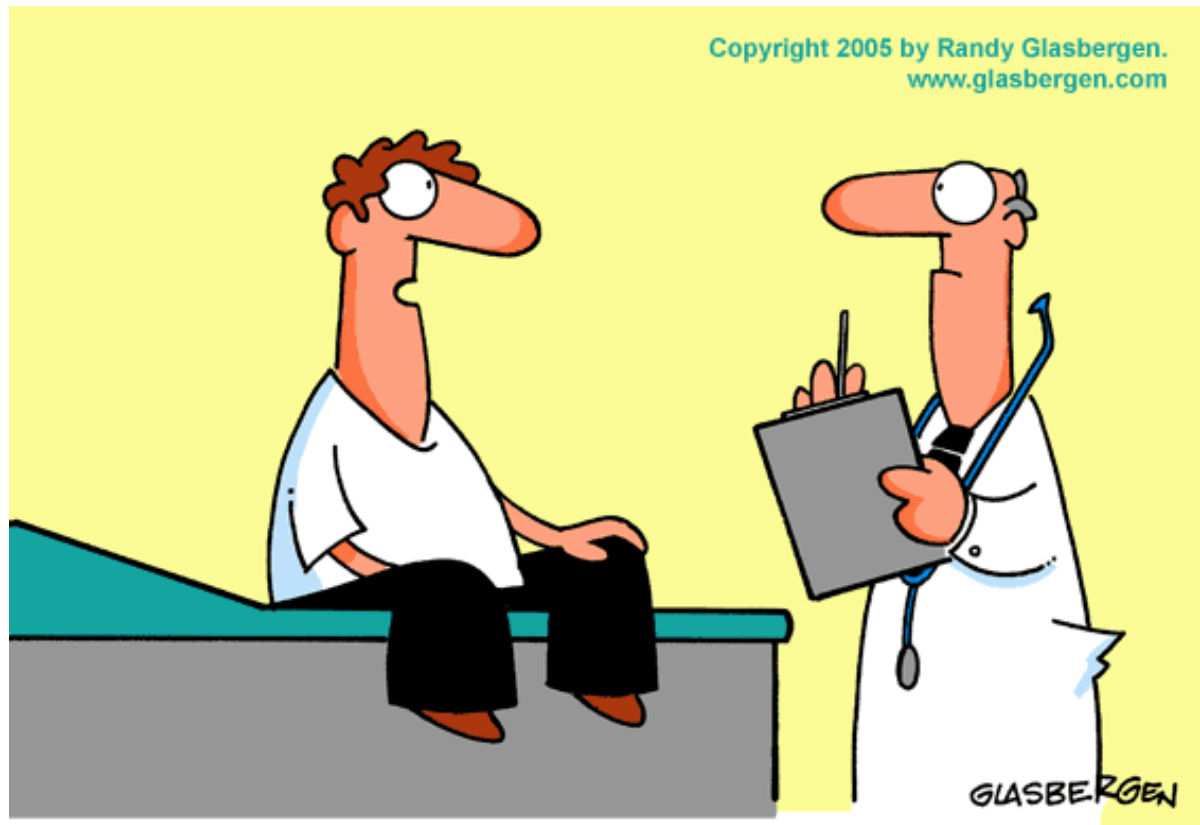
Presentation and Visualization

- Too many arguments!!!
 - Aggregate
 - Summarize
 - Rank
- Too complex arguments and graphs!!!
 - Use appropriate visualizations
 - Make them interactive

Populate argument bases

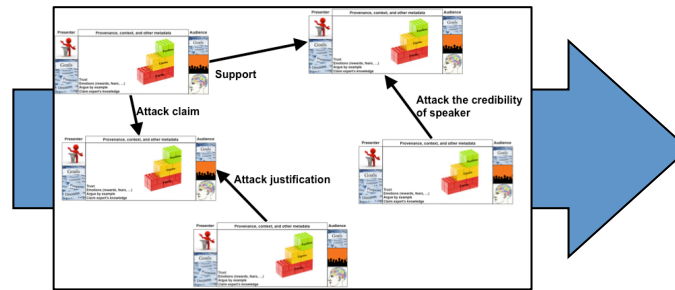
- **Argument Mining**
 - From blogs, sites, wikis, social media
 - Natural Language Processing
- **Annotation**
 - Give incentives to the users!
 - Give tools to the users!
- **Use other media as well**
 - Images, video, etc. as arguments or evidence

Impact

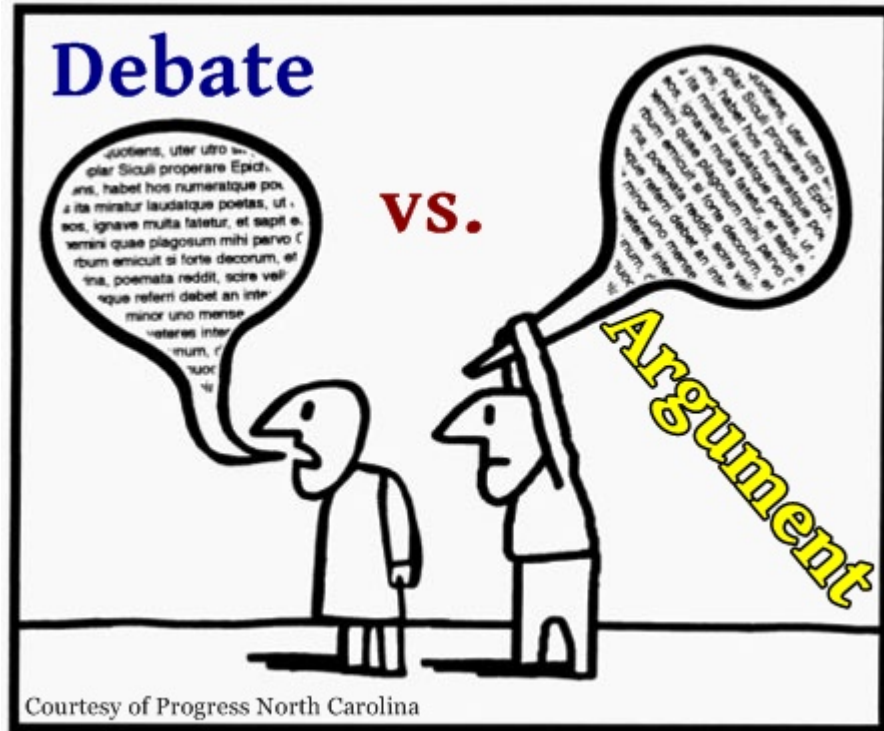


**“I already diagnosed myself on the Internet.
I’m only here for a second opinion.”**

As an Aid Towards Informed Citizenship



As an Aid Towards Better Debates

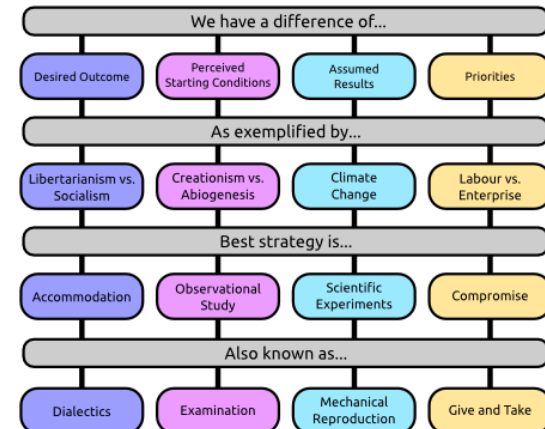


How to Have a Good Argument

Much of what makes an argument (logos rhetoric) fail, is an inability for either party to recognise the type of argument they involve themselves in, and how to deal with different types of arguments. This guide describes loosely some strategies to use to come to a mutually beneficial results.



Art (c) 2011 Mimoly & DoctorMO



Impact Areas

- Structured and civilized argument exchange
- Argument-aware Web search engines
 - Literally global, high-level view of the topic
- Collective awareness, informed decision-making
- Active citizenship, e-democracy, public discourse
- Fact-checking, identification of unjustified opinions, prejudices, biases
 - Avoid reproducing common, but unjustified opinions
 - Avoid being the victim of information manipulation
- E-Commerce & e-marketing
- Legal argumentation, justice attribution

Interdisciplinary Research

- Security, access control, privacy
- Provenance, trust
- Visualization
- Pragmatic Web, Web of Opinions
- Social robotics
- Natural language processing
 - Sentiment analysis
 - Analysis of text, articles etc.
 - Analysis of tweets and short text (e.g., comments)
- Philosophy, rhetorics, social sciences and similar fields

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The vision of a new Web Paradigm



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