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# From Linked Data to Stories: Using explicit semantics to improve interactive information access

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<https://s-media-cache-ak0.pinimg.com/564x/81/14/e1/8114e1c2332f7dbf8b56dd6a369406a3.jpg>

About 2,420,000 results (0.40 seconds)

**Lessons from the War in Afghanistan - C-Span**[www.c-span.org/video/?311930...war-afghanistan](http://www.c-span.org/video/?311930...war-afghanistan) ▾

Apr 5, 2013

**"The War in Afghanistan: What Went Wrong? .... YOU WOULD THINK WE WOULD HAVE DEVOTED THE BULK OF ...****Extended Presence of U.S. Military Will Not Bring an End to ...**[therealnews.com/irect.php?i=11922](http://therealnews.com/irect.php?i=11922)

McChrystal and the Afghan military "solution" Pt1 ... September 11 Crisis , Ending the US War in Afghanistan

**Americans Split On Whether Afghanistan War Was A Mistake**[www.huffingtonpost.com/.../afghanistan-war-mistake...](http://www.huffingtonpost.com/.../afghanistan-war-mistake...) ▾

Feb 9, 2011

When I think of Afghanistan the very first word that pops into my mind is "quagmire" ... their control and we will ...

**Afghanistan's future after Nato troops leave uncertain ...**[www.theguardian.com > World > Afghanistan](http://www.theguardian.com > World > Afghanistan) ▾

Apr 10, 2013

**Afghans will** determine their own fate, says defence secretary, as MPs warns country could descend into civil ...**PressTV - 'War no solution to Afghan crisis'**[edition.presstv.ir/detail/175594.html](http://edition.presstv.ir/detail/175594.html)

Apr 19, 2011

Violence and insecurity persists in war-torn **Afghanistan** despite the ... I **do not think** that there is a ...**LIST OF RELEVANT VIDEOS**

# **What do you think of war as a solution in Afghanistan?**

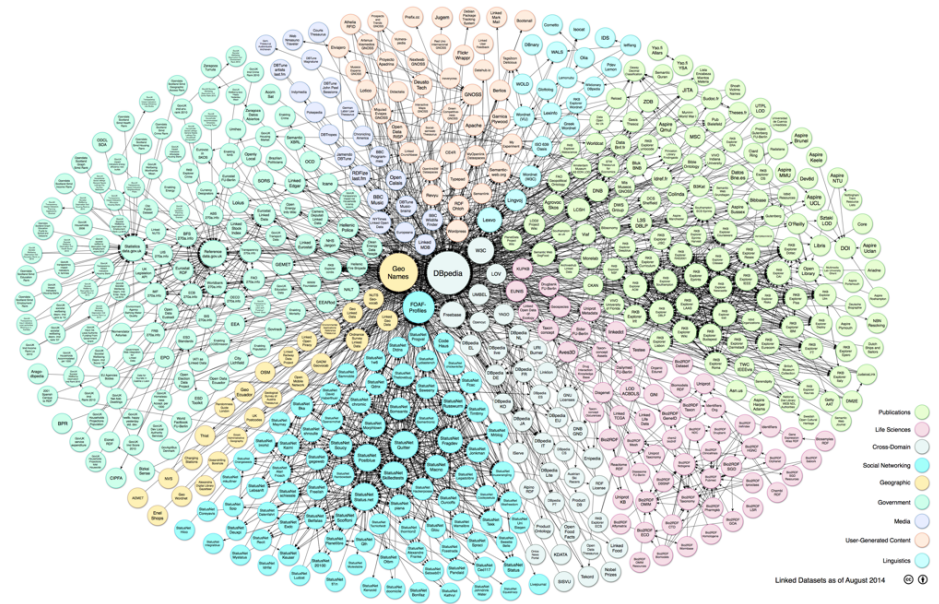




# Research Question: How do we get from lists to stories?



■ Content



■ Descriptions

故事

■ Glue



# Content





# Content for concept "Woman"



<http://dbpedia.org/resource/Woman>

# Descriptions for image

`dbpedia.org/resource/Woman`

`dbpedia.org/resource/Head`



`dbpedia.org/resource/Glasses`



# What do you think of war as a solution in Afghanistan?



- Which concepts are mentioned?

# dbpedia.org/resource/Bomb



Browse using ▾

Formats ▾

Faceted Browser

Sparql Endpoint

## About: Bomb

An Entity of Type : [Thing](#), from Named Graph : <http://dbpedia.org>, within Data Space : [dbpedia.org](http://dbpedia.org)

A bomb is one of a range of explosive weapons that rely on only the exothermic reaction of an explosive material to provide an extremely sudden and violent release of energy (an explosive device). Detonations inflict damage principally through ground- and atmosphere-transmitted mechanical stress, the impact and penetration of pressure-driven projectiles, pressure damage, and explosion-generated effects.

Property	Value
<a href="#">dbo:abstract</a>	<ul style="list-style-type: none"><li>A bomb is one of a range of explosive weapons that rely on only the exothermic reaction of an explosive material to provide an extremely sudden and violent release of energy (an explosive device). Detonations inflict damage principally through ground- and atmosphere-transmitted mechanical stress, the impact and penetration of pressure-driven projectiles, pressure damage, and explosion-generated effects. Bombs have been in use since the</li></ul>

# http://dbpedia.org/resource/ War\_in\_Afghanistan



👁 Browse using ▾

📄 Formats ▾

🔗 Faceted Browser

🔗 Sparql Endpoint

## About: War in Afghanistan

An Entity of Type : [Thing](#), from Named Graph : <http://dbpedia.org>, within Data Space : [dbpedia.org](http://dbpedia.org)

### Property

### Value

- [dbo:wikiPageDisambiguates](#) ▪ [dbr:Soviet-Afghan\\_War](#)
- [dbr:Civil\\_war\\_in\\_Afghanistan\\_\(1989–92\)](#)
  - [dbr:Civil\\_war\\_in\\_Afghanistan\\_\(1992–96\)](#)
  - [dbr:Civil\\_war\\_in\\_Afghanistan\\_\(1996–2001\)](#)
  - [dbr:War\\_in\\_Afghanistan\\_\(1978–present\)](#)
  - [dbr:War\\_in\\_Afghanistan\\_\(2001–present\)](#)
  - [dbr:War\\_in\\_Afghanistan\\_\(2015–present\)](#)

[dbo:wikiPageID](#)

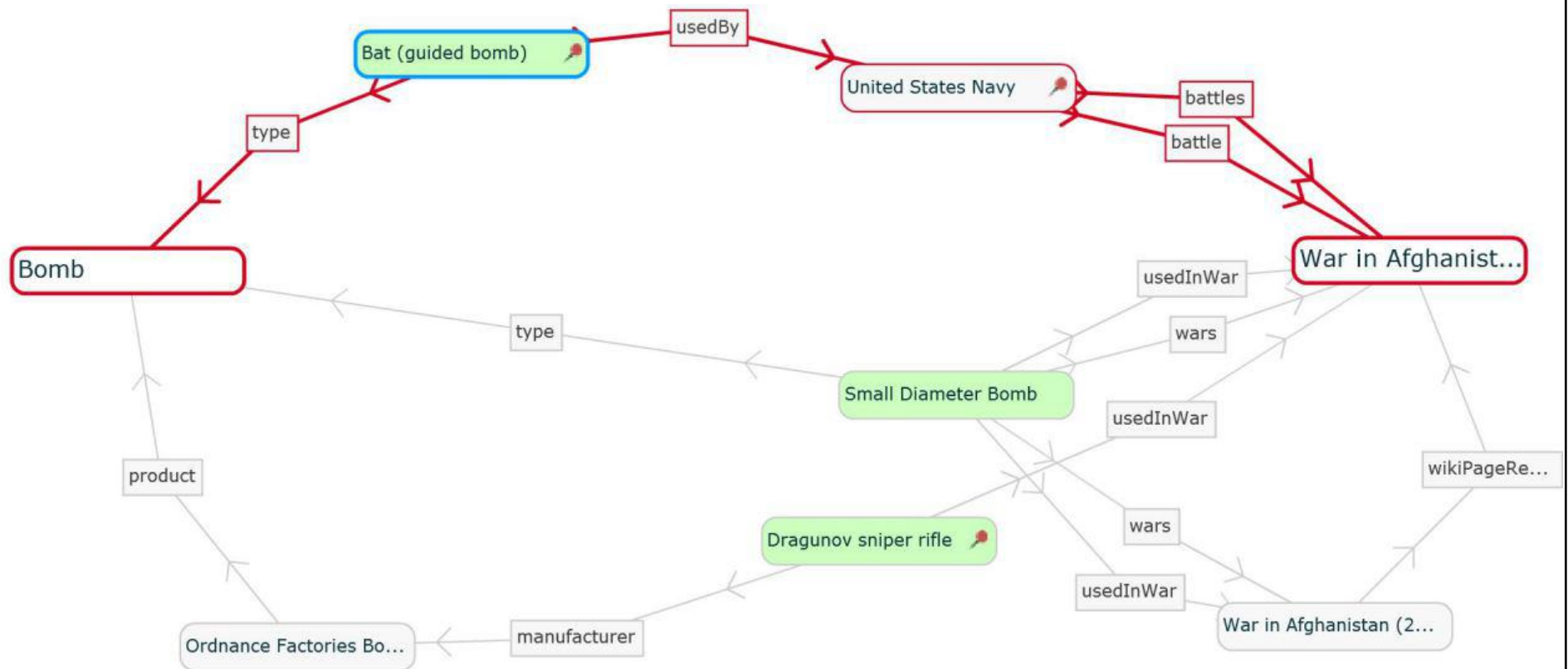
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# Linking Bomb to War in Afghanistan



# Glue examples

- Aristotle's Art of Rhetoric
  - Logos, ethos, pathos
- Film theory

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# Aristotle

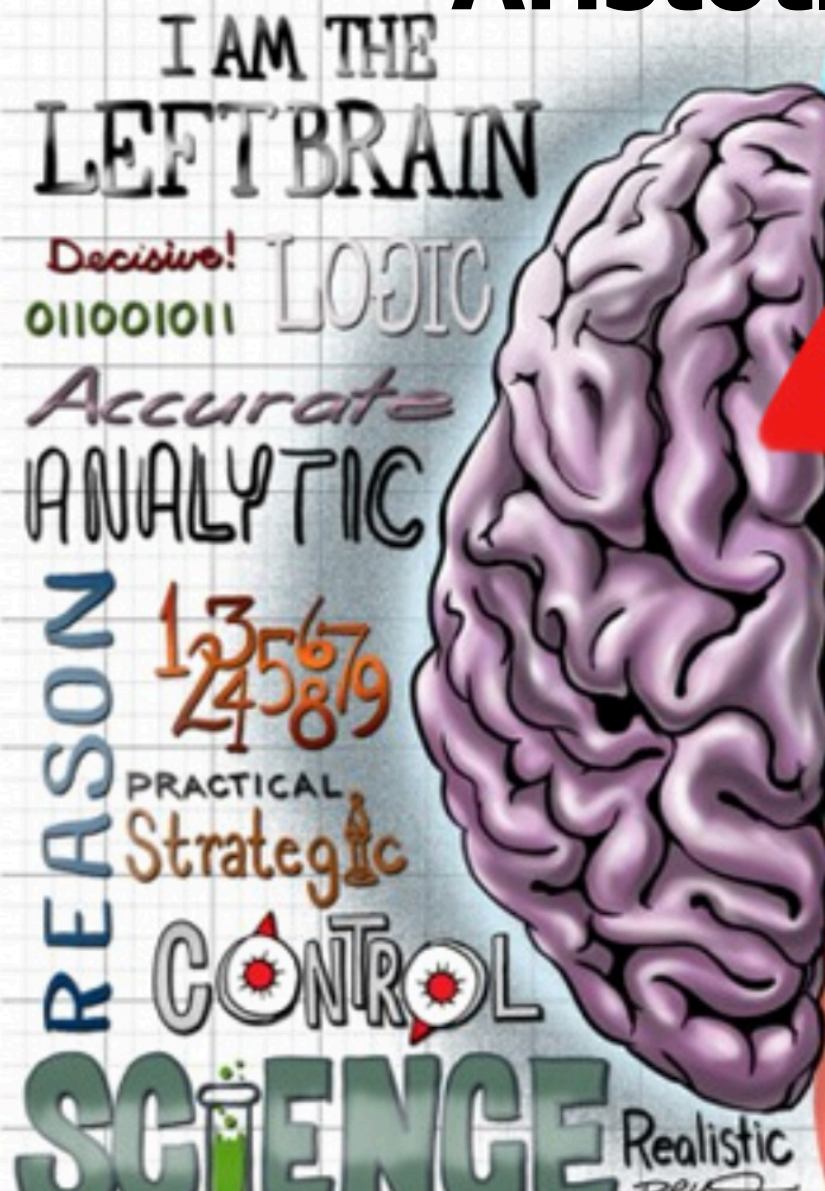
## Art of Rhetoric

- Logos
- Ethos
- Pathos

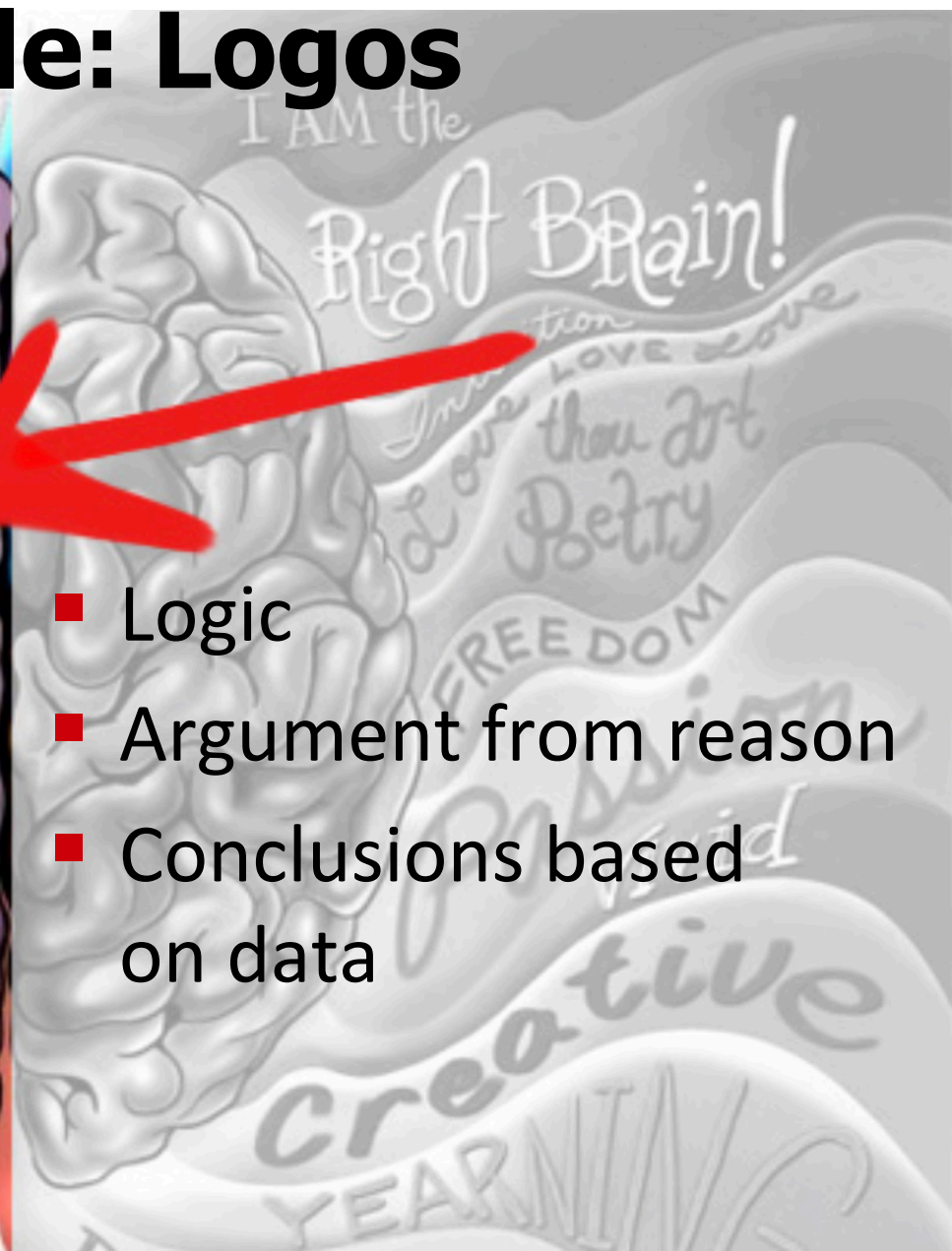




# Aristotle: Logos



- Logic
- Argument from reason
- Conclusions based on data



# Aristotle: Ethos



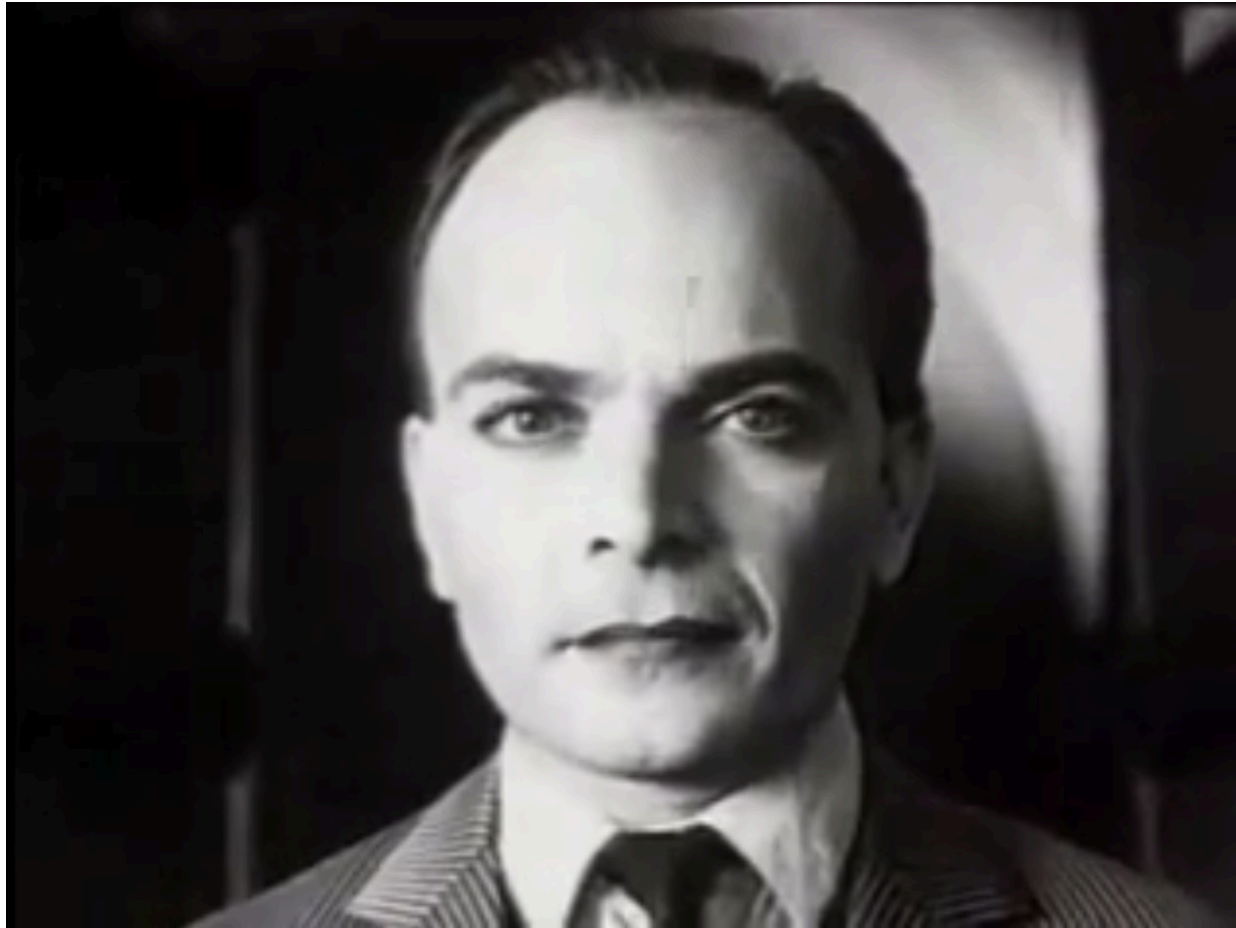
Who are you more likely to believe?

# Aristotle: Pathos





# Film theory: Kuleshov Effect



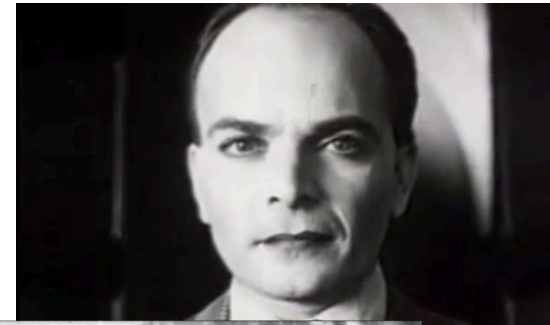
[https://www.youtube.com/watch?v=\\_gGl3LJ7vHc](https://www.youtube.com/watch?v=_gGl3LJ7vHc)

# Film theory: inferring story



The Birth of a Nation, directed by D. W. Griffith, starring Lillian Gish, 1915  
[en.wikipedia.org/wiki/The\\_Birth\\_of\\_a\\_Nation](https://en.wikipedia.org/wiki/The_Birth_of_a_Nation)

# Glue

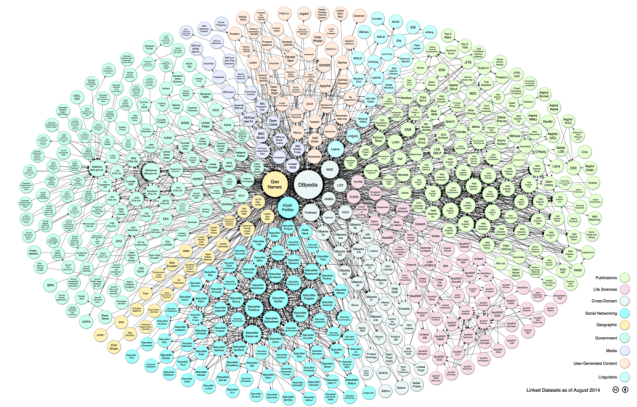


# 故事

# What do we have so far?



■ Content



■ Descriptions



■ Glue

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# What is the problem?

- List of results is ordered with respect to relevance to the query
  - not how a viewer understands video sequences
- Relationships among the video clips are ignored
  - in selecting and ordering
- Result does not convey the information to the user
- We want a selection of clips that *together* combine information for the viewer

# Where are we now?

- Information processes in which media and metadata play a role
  - “canonical processes of media production”
- Vox Populi
  - An example system that generates arguments in a sequence of videos

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# Workflow for Multimedia Applications

- Identify and define a number of canonical processes of media production
- Community effort
  - 2005: Dagstuhl seminar
  - 2005: ACM MM Workshop on Multimedia for Human Communication
  - 2008: Multimedia Systems Journal Special Issue  
(core model and companion system papers)  
editors: *Frank Nack, Zeljko Obrenovic and Lynda Hardman*





**Canonical** Reduced to the simplest  
and most significant form possible,  
without loss of generality

# Overview of Canonical Processes

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Premeditate

Create

Annotate

Package

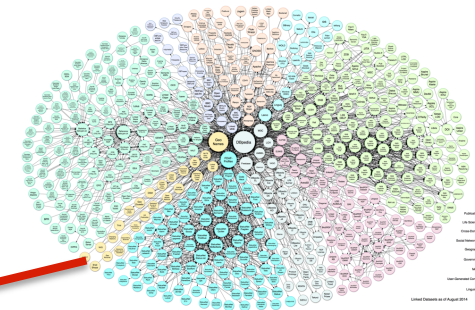
Organize

Construct Message

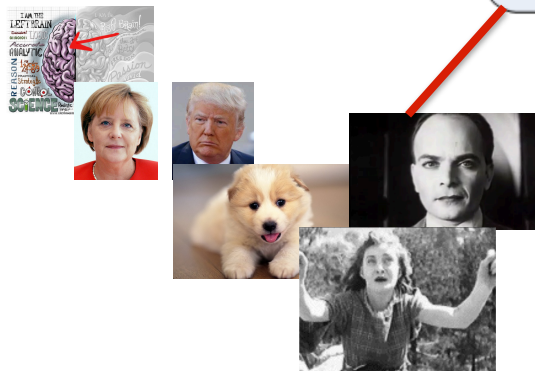
Query

Publish

Distribute



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# Example application areas

- multimedia feature extraction systems
- professional news production systems (VRT)
- new media art
- hyper-video production
- photo book production (CeWe)
- ambient multimedia systems with complex sensory networks



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# **Vox Populi: Generating video documentaries from annotated media repositories**

Stefano Bocconi, Frank Nack (CWI, Amsterdam) 2006



# Video material

- **Interview with America**

video footage with interviews and background material about the opinion of American people after 9-11

[www.interviewwithamerica.com](http://www.interviewwithamerica.com)

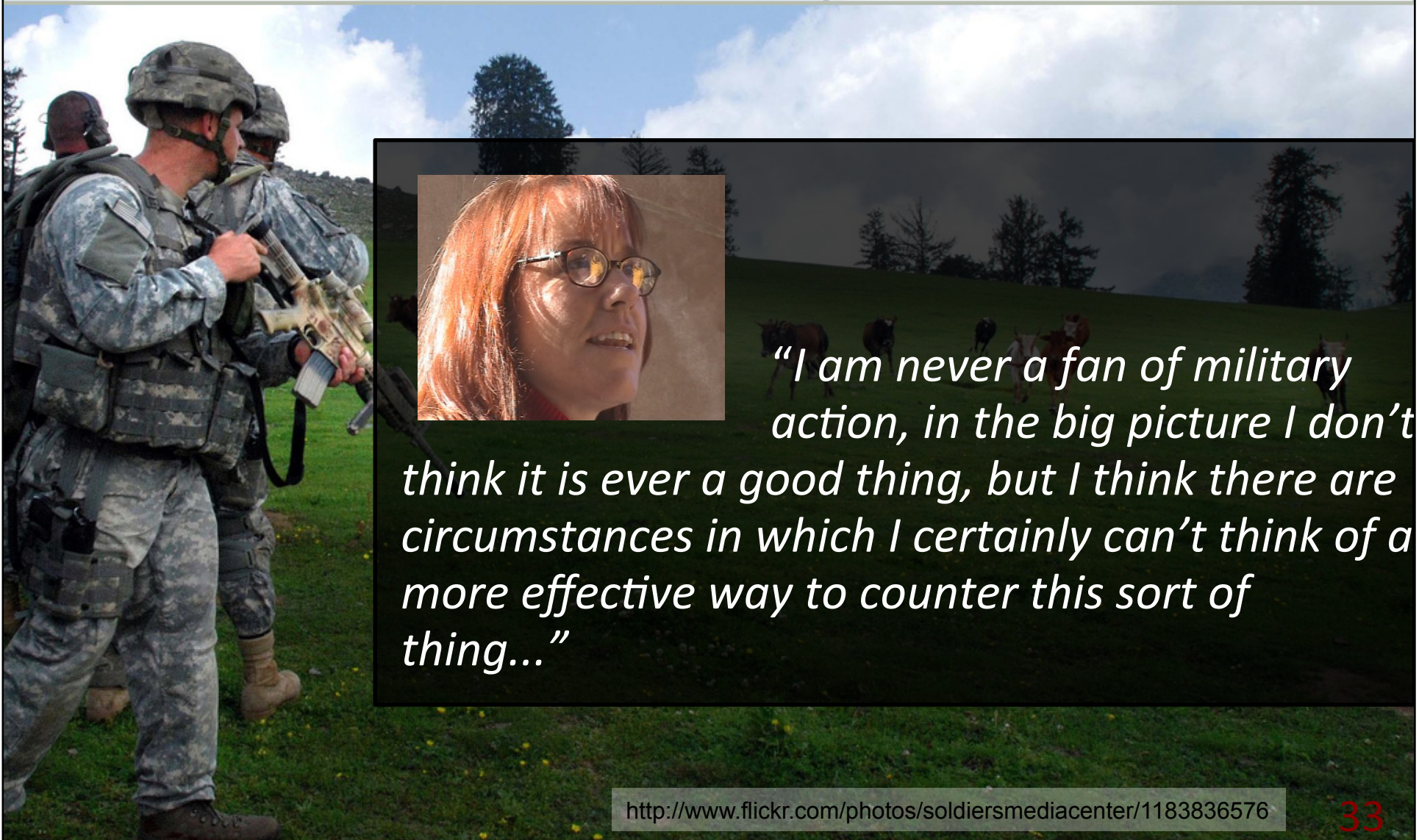
- Filming 27-10-2001 to 01-11-2001 in Stamford (CT), New York (NY), Boston (MA) and Cleveland (OH)

Premeditate

# Video Documentaries on the Web

- Traditional video authoring: there is only one final version, what is shown is the choice of the author/editor
- Proposed video sequence creation:
  - Annotate the video material
  - Show automatically what the user asks to see, using presentation forms a film editor would use

# Example: What do you think of the war in Afghanistan?



*"I am never a fan of military action, in the big picture I don't think it is ever a good thing, but I think there are circumstances in which I certainly can't think of a more effective way to counter this sort of thing..."*

# Generating a short sequence

What do you think of the war in Afghanistan?

**War has  
never solved  
anything**

**Two billions  
dollar bombs  
on tents**



**I am not a  
fan of  
military  
action**

**I cannot think  
of a more  
effective  
solution**



# The annotations

## Rhetorical (**logos**)

- Rhetorical Statement  
(mostly verbal, but visual also possible)
- Argumentation model: Toulmin model

Annotate

## Descriptive

- Question asked (**logos**)
- Interviewee (social, **ethos**)
- Filmic *next slide*



# Filmic annotations

Continuity, e.g.

- camera movement

**none**, pan left/right, shaking, tilt up/down, zoom in/out

- framing continuity (**pathos**)

**close-up**, medium shot, long shot

- gaze direction of speaker

left, centre, **right**

- lighting conditions

- background sound (**pathos**)

Annotate



# Statement encoding

3-part statement:

- <subject> <*modifier*> <predicate>
- E.g. “**war** *best* **solution**”

Annotate

Thesaurus (pre-Wordnet) containing:

- Terms (155)
  - Relations between terms:
    - similar (72),
    - opposite (108),
    - generalization (10),
    - specialization (10)
- e.g. **war** opposite **diplomacy**

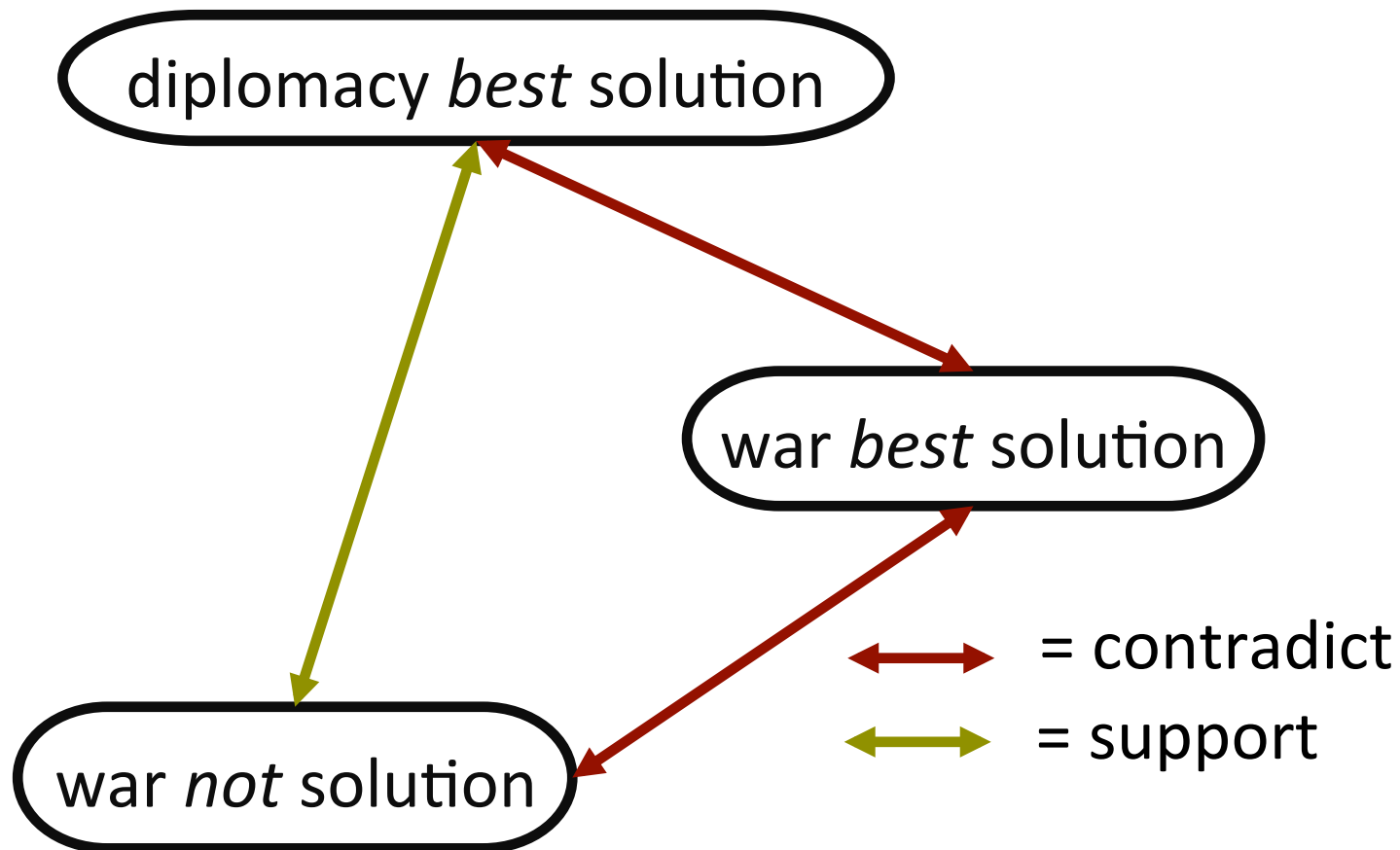


# Connect statements

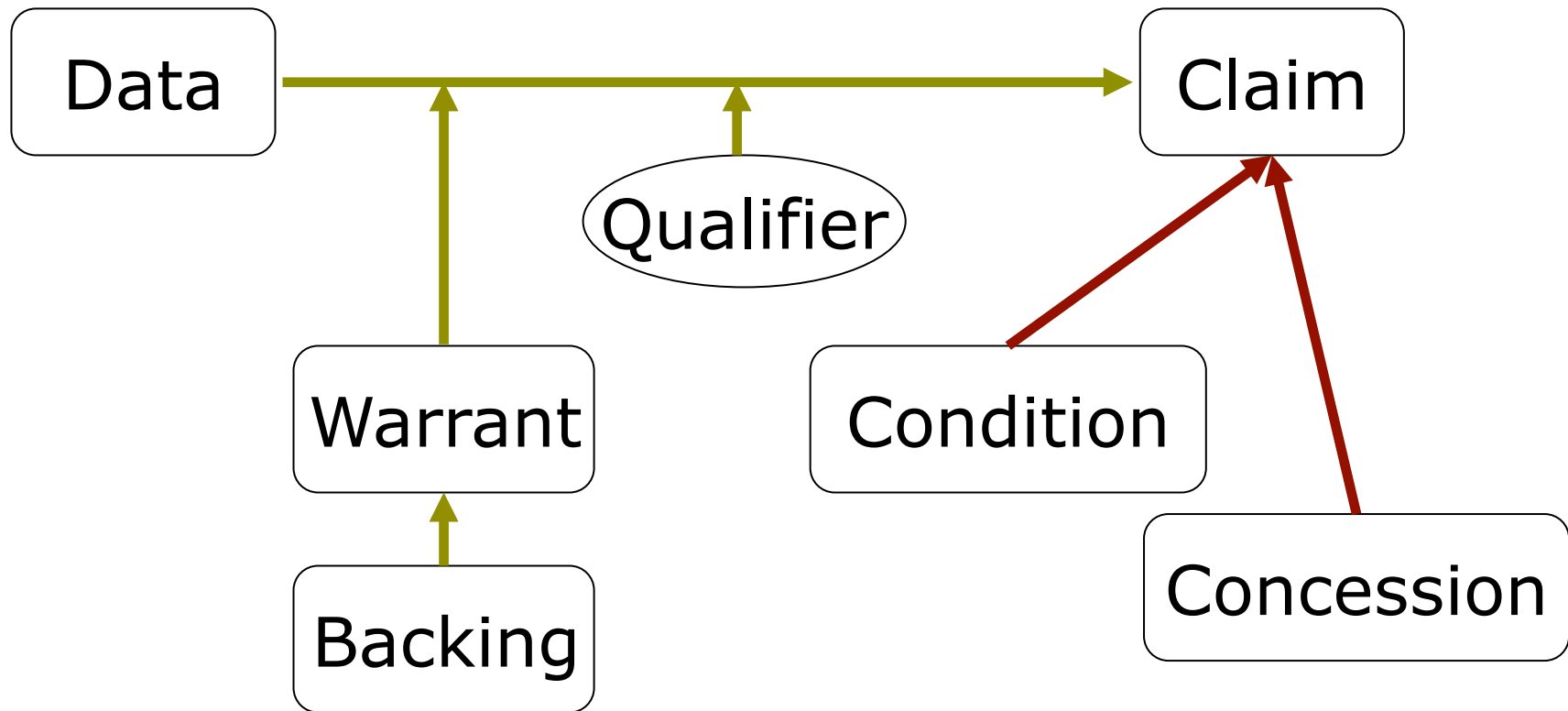
- Using the thesaurus, generate related statements and query the repository  
*“war best solution”,*  
*“diplomacy best solution”,*  
*“war not solution”*
- Create a **graph** of related statements
  - nodes are the statements  
(corresponding to video segments)
  - edges are either *support* or *contradict*



# Statement Graph - domain



# Toulmin model (logos)



*57 Claims, 16 Data, 4 Concessions,  
3 Warrants, 1 Condition*

# Putting it all together

**Two billions dollar bombs on tents**



Claim

*contradict*

Claim

**I cannot think of a more effective solution**

*weaken*

Concession

**I am not a fan of military action**

Claim

*support*

Organize

**War has never solved anything**

# What do you think of the war in Afghanistan?

Publish

**War has  
never solved  
anything**

**Two billion  
dollar bombs on  
two dollar tents**



**I am not a  
fan of  
military  
action**

**I cannot think  
of a more  
effective  
solution**

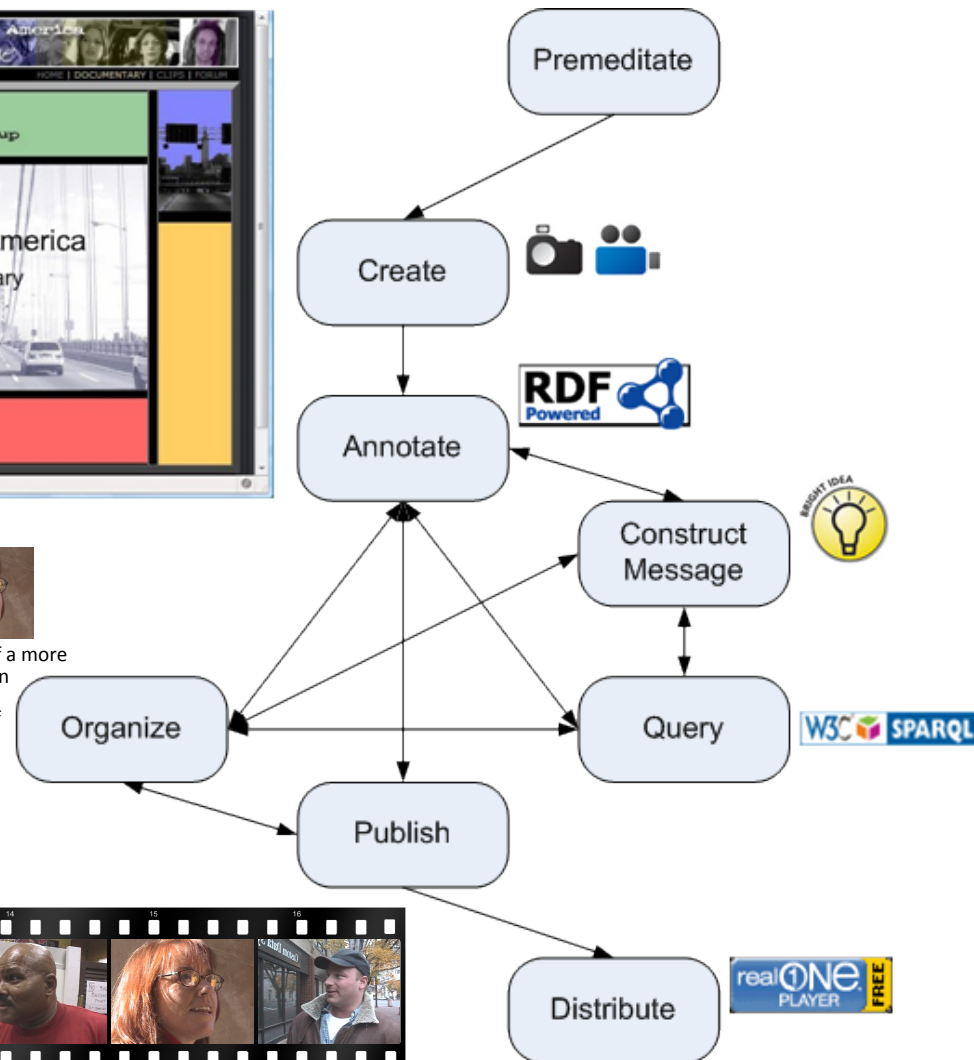
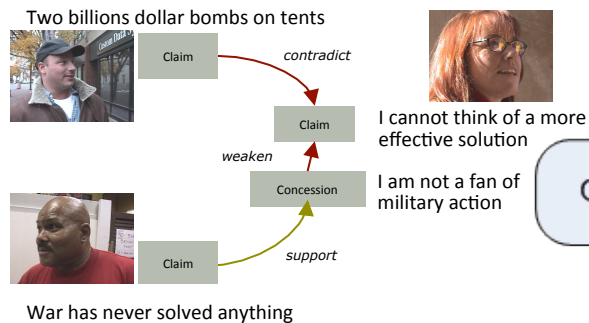


# Vox Populi interface

Question		Interviewee		Opinion		
<div>Why did they do what they did?</div> <div>What do you think of the casualties among civilians?</div> <div>What do you think of the Afghanistan war?</div> <div>What are the consequences of the war?</div> <div>What are the roots of the problem?</div> <div>What do you think about the Anthrax?</div>		<div>Cameroun Parking Guard at Stamford</div> <div>Lawyer in Harward</div>		<div>War in Afghanistan - Pro</div>		Position
Age	Education	Employment	GeoLocation	Race	Religion	Sex
<div>Middleage</div> <div>Old</div> <div>Teenager</div> <div>Young</div>	<div>HighEducated</div> <div>LowEducated</div> <div>MediumEducated</div>	<div>HighIncomeJob</div> <div>LowIncomeJob</div> <div>MiddleIncomeJob</div> <div>Retired</div> <div>Student</div>	<div>NotUSA</div> <div>USA</div>	<div>AmericanIndian</div> <div>Asian</div> <div>Black</div> <div>Hispanic</div> <div>White</div>	<div>Atheist</div> <div>Christian</div> <div>Muslim</div>	<div>Female</div> <div>Male</div>
First Character						
Age	Education	Employment	GeoLocation	Race	Religion	Sex
<div>Middleage</div> <div>Old</div> <div>Teenager</div> <div>Young</div>	<div>HighEducated</div> <div>LowEducated</div> <div>MediumEducated</div>	<div>HighIncomeJob</div> <div>LowIncomeJob</div> <div>MiddleIncomeJob</div> <div>Retired</div> <div>Student</div>	<div>NotUSA</div> <div>USA</div>	<div>AmericanIndian</div> <div>Asian</div> <div>Black</div> <div>Hispanic</div> <div>White</div>	<div>Atheist</div> <div>Christian</div> <div>Muslim</div>	<div>Female</div> <div>Male</div>
Second Character						
Strategy		Bandwidth	Intercut	Caption		Query
<div><input type="radio"/> None</div> <div><input checked="" type="radio"/> Create Clash</div> <div><input type="radio"/> Create Support</div> <div><input type="radio"/> Vox Populi</div>		<div><input type="radio"/> Low Bandwidth</div> <div><input checked="" type="radio"/> Medium Bandwidth</div> <div><input type="radio"/> High Bandwidth</div>	<div><input checked="" type="radio"/> True</div> <div><input type="radio"/> False</div>	<div><input type="radio"/> On (can cause problems)</div> <div><input checked="" type="radio"/> Off</div>		
<div>Done</div> <div>Reset</div>						

Construct  
Message

# Vox Populi Processes



# Vox Populi Conclusions

- Automatic generation of video interviews augmented with supporting and/or contradicting material
- The **user** can determine the subject and the bias of the presentation
- The **documentarist** can add material and let the system generate new documentaries

# Pointer & Acknowledgments

- More on VoxPopuli at:  
<http://www.cwi.nl/~media/demo/VoxPopuli/>
- VoxPopuli was funded by the Dutch national ToKeN I<sup>2</sup>RP and CHIME projects



# How can annotations help?

What can be expressed explicitly?

- the message to be conveyed
- objects that are depicted in a media asset
- domain information (e.g., art, painter)
- human communication roles (discourse)

What can they be used for?

- disambiguating query terms
- grouping similar items for conveying topic breadth
- visualizing items for presentation, e.g. timeline, map
- finding similar items
- organising the order of presentation

# What can be expressed?

- The story/message to be conveyed, e.g.
  - War is not effective
- objects that are depicted in the video clip
  - linked descriptions from LOD
- how we communicate the story, e.g.
  - Toulmin
  - logos, ethos, pathos
  - film theory

# What next?

- Build on Vox Populi semantic graph engine generation and selection for other discourse models
- Explore other domains where discourse is valuable
  - forming opinions on environmental issues
  - education, crime-solving
- Long-term goal is to have a collection of related discourse models

# Acknowledgements



Jacco van  
Ossenbruggen



Frank Nack



Raphaël Troncy



Stefano  
Bocconi



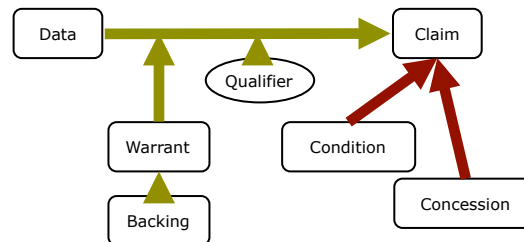
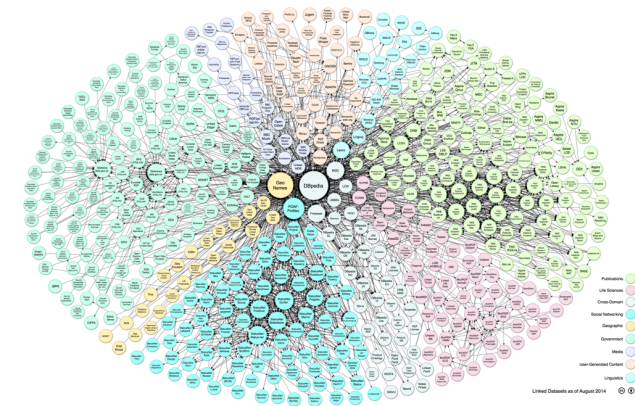
Ana Carina  
Palumbo



Andre Fialho



# From Linked Data to Stories



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# Literature

- Special Issue on Canonical Processes of Media Production  
<http://link.springer.com/journal/530/14/6/>  
<http://www.cwi.nl/~media/projects/canonical/>
- Lynda Hardman, Zeljko Obrenovic, Frank Nack, Brigitte Kerhervé and Kurt Piersol: *Canonical Processes of Semantically Annotated Media Production*. [Multimedia Systems Journal](#), 14(6), 2008
- Philipp Sandhaus, Sabine Thieme and Susanne Boll: *Canonical Processes in Photo Book Production*. [Multimedia Systems Journal](#), 14(6), 2008
- Stefano Bocconi, Frank Nack and Lynda Hardman: *Automatic generation of matter-of-opinion video documentaries*. [Journal of Web Semantics](#), 6(2), p139-150, 2008.
- Ana Carina Palumbo and Lynda Hardman: *User information needs for environmental opinion-forming and decision-making in link-enriched video*  
In [EuroITV '13](#), pp 85-88