Presenting Knowledge on the Semantic Web

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Introduction

- Main theme of our work:
  - The role that **explicit discourse** information plays in the *personalized generation process*
  - The difference between:
    - a *list* of retrieval results ordered *most relevant first* and
    - a *presentation* that has *structure* interpretable by the end user, giving the collection *sense of belonging to same presentation*

Outline

- Past: Re-use of video
  - Documentary Generation
    Vox Populi (Stefano Bocconi, Frank Nack)
    ToKeN I^{2}RP (NWO)
- Present: Novel interfaces to eCulture
  - MultimediaN (BSIK)
- Future: Generating news presentations
  - IPTC news codes, NewsML2
    K-Space (IST NoE)

Generating video documentaries from annotated media repositories

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Talk Outline

- ☐ Motivation
- ☐ Example
- ☐ Scenarios
- ☐ Technical details
  - ■ Annotations
  - ■ Editing Process
- ☐ Conclusions

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 authoring:
  - ■ Annotate the video material semantics
  - ■ Show automatically what the user asks to see, using presentation forms a film editor would use

Video material

- ☐ Focus on video interviews about controversial issues
- ☐ **Interview with America** video footage with interviews and background material about the opinion of American people after 9-11
  www.interviewwithamerica.com

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…*"

What do you think of the war in Afghanistan?

I am not a fan of military actions

I cannot think of a more effective solution

War has never solved anything

Two billions dollar bombs on tents

The annotations

- ☐ Rhetorical
  - ■ Rhetorical Statement
    (mostly verbal, but visual also possible)
  - ■ Argumentation model: Toulmin model
- ☐ Descriptive
  - ■ Question asked
  - ■ Interviewee (social)
 - ■ Filmic (e.g. location/time/framing/gaze)

Encode statements

- ☐ Statement formally annotated:
  - ▪ <subject> <modifier> <predicate>
  - ▪ E.g. **war best solution**, **diplomacy best solution**
- ☐ A thesaurus 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*
    "war best solution" contradicts "war not solution"

Graph of related statements
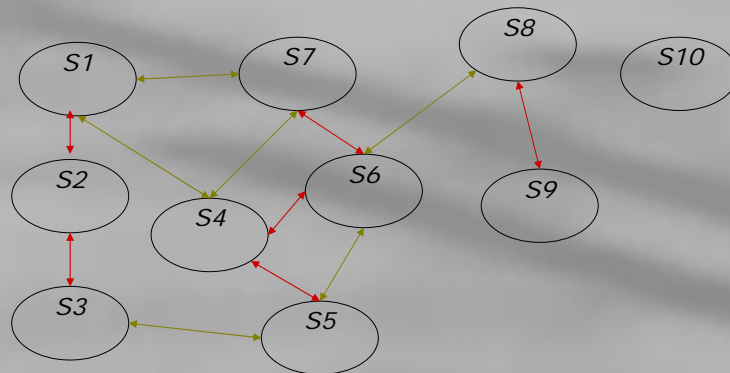
Toulmin model
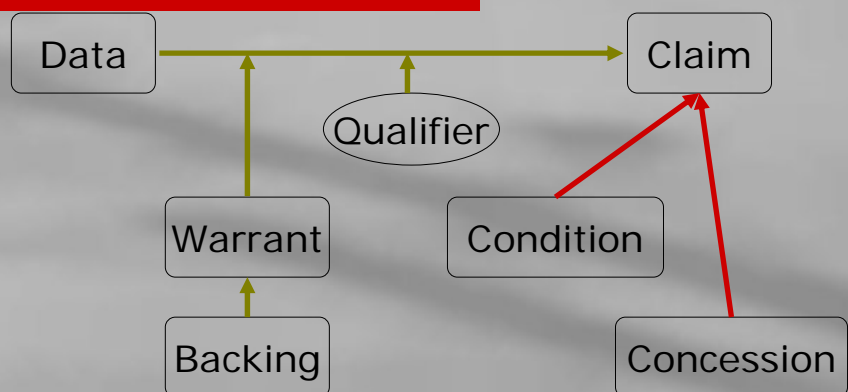
57 Claims, 16 Data, 4 Concessions,
3 Warrants, 1 Condition

Analysis of the Example

Two billions dollar bombs on tents

Claim — *contradict* → Claim

I cannot think of a more effective solution

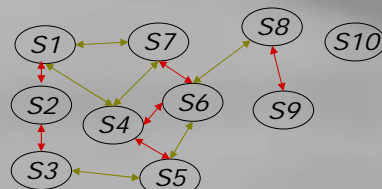*weaken*

Concession

I am not a fan of military actions

Claim — *support*

War has never solved anything

Facts and features

☐ Annotations:
1 hour annotated, 15 interviews,
60 interview segments, 120 statements

☐ Partially tunable: examining the statement
graph gives feedback on the quality of the
annotations and the thesaurus

S1, S7, S8, S10, S2, S4, S6, S9, S3, S5

⟷ = support
⟷ = contradict

Controlling the Bias

- Video documentaries are not neutral account of reality: the selection and editing of the footage expresses a point of view
- Editing strategy:
  - Balanced
  - Pro opinion X
  - Against opinion X
- We use:
  - Logos (the statements)
  - Ethos (based on user profile)
  - Film editing (e.g. framing, gaze)

Vox Populi interface

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

Pointers & Acknowledgments

- This presentation and a Demo available at:
  http://www.cwi.nl/~media/demo/IWA/

- This research was funded by the NWO ToKeN I²RP and CHIME projects.

MultimediaN e-Culture

- Goal: Improve *in context* search and presentation of results by
  - Linking multiple collections
  - Reusing existing background knowledge (rich domain!)
- Partners: ICN, DEN, UvA, VU, CWI
- Current status:
  - Collections: Rijksmuseum A'dam (750), Artchive.com (3000), Rijksmuseum Volkenkunde (250.000), ...
  - Thesauri: Getty AAT, TGN, ULAN; SVCN, WordNet, ...
  - In total about 10 million RDF statements

MultimediaN E-Culture Demonstrator

Cultural Heritage Data

Collections

Artchive.com	36K
Rijksmuseum	30K
Ethnographical	1.1M

...and growing

Vocabularies

SVCN (ethnographic)	65K
W3C Wordnet	2.2M
Getty: AAT	450K
TGN	500K
ULAN	1.5M

...and growing

Schemas

Dublin Core
VRA Core
E-Culture Specific

Triples 6,663,465 *and counting...*

web standards

HTML	OWL
SVG	RDF
AJAX	RDFa

SWI-Prolog
Semantic Web
Server (SPARQL support)

Generic Multilingual Interfaces

Semantic Grouping
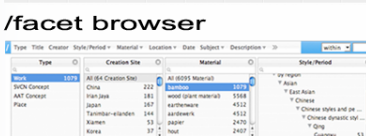
Works created by an artist with matching AAT style (214)

Two Girls in a Yellow and Red Inter..., Matisse, Henri
Green Stripe (Madame Matisse), Matisse, Henri
A Glimpse of Notre Dame in the Late ..., Matisse, Henri
Le bonheur de vivre (The Joy of Life), Matisse, Henri
Portrait of Matisse, Derain, André
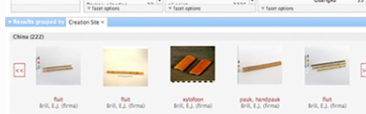
Works created by a teacher of an artist with matching AAT style (3)

Orpheus
Jason
Herald and the Muse

Semantic Timeline

1850 1855 1860 1865 1870 1875 1880 1885 1890 18

Gauguin, Paul
Gogh, Vincent van
Post-Impressionist
Breitner, George Hendrik

/facet browser

e-culture.multimedian.nl   Semantic Web Challenge 2006

MultimediaN Eculture project

- http://www.multimedian.nl/
- http://e-culture.multimedian.nl/demo/search

(Demo)

Architecture of the demonstrator

- Open Web standards
  - XML, XHTML, SVG, RDF/OWL, SPARQL
- SWI-Prolog's semantic web package
  - SPARQL interface, RDF/OWL partial reasoning
- AJAX for rich Web client interaction
  - Semantic keyword suggestion
  - Dynamic tree browser for structured taxonomies
- Java applets for other interaction types
  - Picture point: annotating image content

News Presentations

- Goal: similar to eCulture, improve dynamic presentation of news archives
- High quality semantic multimedia metadata enables:
  - Easy exchange of news items
  - Semantic search of particular news items
  - Delivery of personalized news content to customers
    - ‣ Interactive browsing in a news archive
    - ‣ Cross-modality:
      including news stories, photos, graphics, audio, videos
    - ‣ For different end-user platforms (mobiles, PC, handhelds, etc.)

IPTC Metadata Standards

- IPTC has defined 28 sets of multilingual News Codes
  - ‣ NewsCodes use numeric strings = language agnostic
  - ‣ Subject ≈ 1300 terms, 3 levels hierarchy
  - ‣ NewsCodes Viewer application View
  - ‣ multilingual (currently 6: de, en-GB, es, fr, it, ja-JP)
- XML Wrapper
  - Metadata embedded in a photo: XMP
  - Metadata stored in a separate file: NewsML

NewsML2 and the SW

- Common basis
  - Distributed resources (news item) globally and uniquely identified => URI
  - Use of shared and controlled vocabularies
- Natural switch and numerous benefits
  - Better control of NewsML2 descriptions (logical consistency check)
  - Enhanced search of News topic (logical inferences)
  - Intelligent presentation – Semantic interfaces
  - Unified news management – Semantic CMS

What we have done so far?

- Creation of a News domain ontology in OWL
  - Based on the UML model specifications of NewsML2
- Online conversion service
  - Mapping of the IPTC NewsCodes into various SKOS thesaurus
  - Transforming dynamically the NewsML2 (XML) descriptions in its equivalent RDF counterpart
    - Using to the NewsML ontology
    - Linking to the SKOS IPTC NewsCodes

http://newsml.cwi.nl/

What is the added value?

- Example: A "normal" day in AFP
- Dataset
  - 200 NewsML2 stories,
    35 photos (original size + thumbnails) +
    35 NewsML2 descriptions
  - Covering various subjects e.g.:
    - A military drill for dealing with contaminations (toxic, nuclear or biological) - Photo
    - A protest made on the Arch of Triumph in Paris, related to the Iran nuclear crisis - Photo
    - A meeting between the French president and Israeli prime minister - Photo

Example 1: reasoning on the content

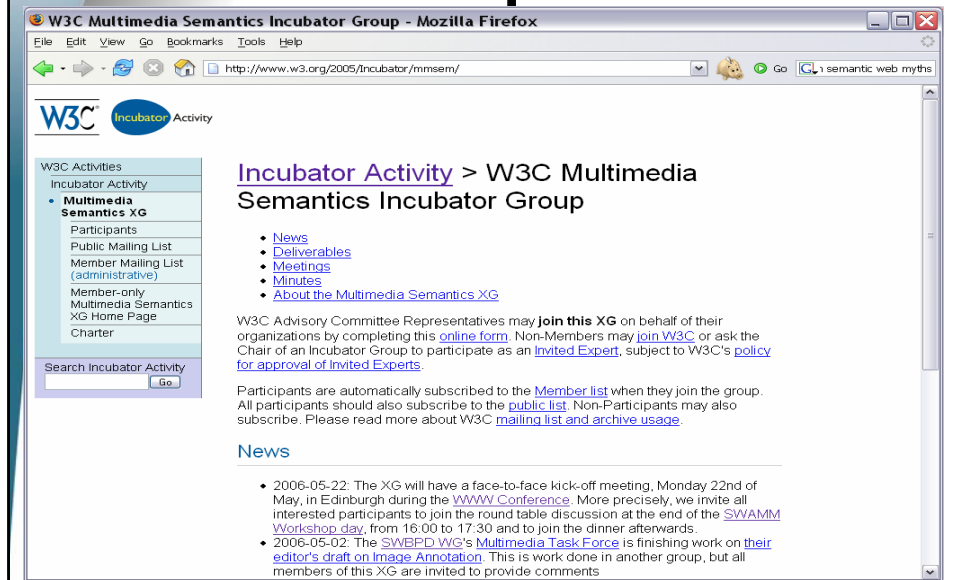- Find all related news about "Nuclear"

Nucléaire ⟶ Military drill (NBC)

Nuclear ⟶ Iran nuclear crisis → *Arc de Triomphe* protest

Iran nuclear crisis → Chirac – Elmer summit

W3C Multimedia Semantics Incubator Group

W3C Multimedia Semantics Incubator Group

- Light-weight, one year (May 2007) group looking at image and other multimedia metadata on the Web
- Focus on interoperability with existing standards
- http://www.w3.org/2005/Incubator/mmsem

Conclusions

- Re-using video for end users
  Vox Populi
- Semantic access to cultural repositories
  eCulture
- News presentations
  NewsML
- Use cases in MM Sem XG
  http://www.w3.org/2005/Incubator/mmsem/wiki/News_Use_Case
  http://www.w3.org/2005/Incubator/mmsem/wiki/