Providing Flexible Interfaces to Annotated Multimedia Repositories

Lynda Hardman

CWI, Semantic Media Interfaces
TU/e, Multimedia and Internet Technology
Chiaroscuro

Chiaroscuro (Italian) and chiaro-obscur (French) both mean 'light-dark'. They are methods invented by painters to create a contrast of light and dark shading in paintings, drawings and prints. Although the effect had already been used for many years, the term only came into fashion in the late sixteenth century. Originally, the word came from Italy. The painter Caravaggio (1571-1610) made chiaroscuro his trademark. He was a master at painting illuminated scenes in dark settings.
One size *doesn’t* fit all

**Chiaroscuro**

Chiaroscuro (French) and chiaroscuro (Italian) both mean ‘light-dark’. Both terms are used to describe the strong contrast of light and dark shading in paintings, drawings and prints. Although the effect had already been used for many years, the term only came into fashion in the late sixteenth century. Originally, the word came from Italy. The painter Caravaggio (1571–1610) made chiaroscuro his trademark. He was a master at painting illuminated scenes in dark settings.
The problem

• Too many users need their own information
  – for their level of expertise
  – using appropriate media
  – in an appropriate style
  – displayed on their own device

• Multimedia information design is expensive

• There has to be some automation in the process
Overview of topics

• Dependencies in multimedia design
• Canonical processes of media production
• Semantics for improving interaction
• NewsML 2.0: semantics of news media assets
• Vox Populi: creating argument structure with video fragments
Chiaroscuro & Rembrandt Harmensz. van Rijn

Chiaroscuro
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Self Portrait (1661)
Three ingredients

Content
Clair-obscur (Frans) en chiaroscuro (Italiaans) betekenen 'licht-donker'. Beide termen worden gebruikt om sterke licht-donkercontrasten in schilderijen, tekeningen en prenten aan te duiden. Hoewel het effect al eerder werd toegepast, is de term pas sinds het einde van de 16de eeuw in zwang. De oorsprong van het woord ligt in Italië. De schilder Caravaggio (1573-1610) maakte het chiaroscuro-effect tot zijn handelsmerk. Hij was een meester in het schilderen van donkere tafereelen met één felle lichtbundel.
Three ingredients

Presentation structure

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Three ingredients

Presentation structure

Aesthetics

Content
Aesthetics of example

Fonts

Layout

Colours
Design dependencies

Presentation structure

Aesthetics

Content

abcdefghij
abcdefghijk
ABCDEF
abcdefghij
abcdefghijk
Presentation Structure depends on Layout
Style Depends on Content

Chiaroscuro & Rembrandt

The Stone Bridge (1638)

Chiaroscuro & Rembrandt

The Stone Bridge (1638)
Presentation structure depends on content

Chiaroscuro

Caravaggists

Rembrandt

1631

1628

1638

1623

1628
Example Presentation Structure

Chiaroscuro

Caravaggists

1623

Rembrandt

1628

1628

1631

1638
Different presentation styles

- Large amount of information
- High interaction
Please choose the artist(s) you want information about:

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| Haag, Tethart Philipp Christian | Hiller, Joachim |
| Haarlem, Cornelis Cornelisz. van | Hiroshige, Utagawa |
| Haaxman, Pieter Alardus | Hisgen & Co., O. |
| Hack, Marinus Johannes | Hobbema, Meindert |
| Hainhofer, Philipp | Hodges, Charles Howard |
| Hals, Dirck | Hogenberg, Frans |
| Hals, Frans | Hogers, Jacob |
| Hanneman, Adriaen | Hokusai, Katsushika |
| Hannke, | Hondecoeter, Melchior d' |
| Hansen, Carel Lodewijk | Hondius I, Hendrick |
| Hausdorff, | Honthorst, Gerard van |
| Heda, Willem Claesz. | Hooch, Pieter de |
| Heem, Jan Davidsz. de | Hoogstraten, Samuel van |
| Heemskerck, Maarten van | Horrix, Gebr. |
| Heemskerck, Willem Jacobsz. van | Horrix, Matthijs |
| Helst, Bartholomeus van der | Houckgeest, Gerrit |
| Herselle, Josse van | Houdon, Jean-Antoine |
| Heyden, Jan van der | Hove, Bartholomeus J.W.M. van |
| Hillegaert, Pauwels van | Huysum, Jan van |
The Kitchen Maid

With quiet concentration a woman pours milk into a bowl. With her left hand she supports the can she is pouring from. Around her are various objects: a loaf of bread, a stoneware jug, a basket and a brass bucket. The woman is standing near the window so she can see what she is doing. The light falls on her hands; her silhouette is dark against the white wall. There is a fascinating play of light and shadow in this painting.

**Genre**
This is one of Johannes Vermeer’s genre pieces in which he establishes an intensely intimate atmosphere. Although the artist observes his model from nearby, she continues with her work, totally unperturbed.

**Technique**
Vermeer made use of light and perspective to create the intimate atmosphere. All lines of perspective lead to the right hand of the girl, which subtly accentuates the task of pouring milk in which she is completely engrossed. The horizon lies beneath her head, so that the viewer seems to look up.
Artists: Johannes Vermeer, Pieter de Hooch  Artefact: The Kitchen Maid  Genre: Genre piece

The Kitchen Maid
ca. 1658, Johannes Vermeer
Oil on canvas, 45.5 x 41 cm

Genre
- [E] Ex [J] All

Style
- [E] Ex [J] All

Technique
- [E] Ex [J] All

Johannes Vermeer
- [E] Ex [J] All

The Sleeping Girl
- [E] [J] All
Artists: Johannes Vermeer, Pieter de Hooch  
Artefact: The Kitchen Maid  
Genre: Genre piece

The Kitchen Maid  
Genre: Genre piece  
Justification

ca. 1658, Johannes Vermeer  
Oil on canvas, 45,5 x 41 cm

Artemisia, ca. 1645, follower of Domenico Fiasella, Canvas
Different presentation styles

• Entertainment rather than information
• Low interaction
Step 1: How long do you want your story to be? 3 minutes.

Step 2: What is the preferred character of your story?

Prosaic
2. Search by name of artist:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Vermeer, Johannes

Artefacts in Rijksmuseum:

"Little Street", ca 1658
The Kitchen Maid, ca 1660
Woman reading a Letter, 1662/1663
The Love Letter, 1669/1670

All other Artefacts in chronological order:

Soldier and a laughing Girl, ca 1658
View of Delft, 1660/1661
The Music Lesson, 1662-1664
Woman holding a Balance, 1669/1670
Young Woman with a Water Pitcher, 1668/1669
The Kitchen Maid
by Johannes Vermeer
ca 1660
Oil on canvas
45.5 x 41 cm
Duration: 3 minutes  Character: Prosaic  Artefact: The Kitchen Maid

Tiny points of light  Nail with shadow
Cracked Windowpane  Brass bucket
Flexible interfaces to MM

• Creating multimedia presentations requires
  – understanding message of presentation
  – knowing specifications of use context
  – making design dependencies explicit
  – taking these dependencies into account

• This is what we want to achieve
Creating Meaningful Presentations

Lynda Hardman
Jacco van Ossenbruggen

Semantic Media Interfaces
CWI, Amsterdam
http://www.cwi.nl/~media
Introduction

• Overview of our research activities:
  – Creating meaningful presentations from query results
  – Part of the K-Space, Passepartout and Multimedia-N

• 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*
Existing approaches in presenting query results

– No explicit discourse (only domain semantics):
  • Noadster - clusters from domain semantics
  • Topia - preselecting concepts in domain semantics
  • Museo Suomi - selection based on domain semantics

– Deriving some aspects of discourse:
  • Giving meaning to clustering process
  • Assigning different weights to clusters => ordering
    – Influence the way people perceive information
Semantic Web browsing

- Noadster
- Generalised semantic web browsing
- Integrating global and local browsing

- Lloyd Rutledge, WWW 2005
Inferring document structure

- Topia
- Rijksmuseum ARIA database -> RDF
- Clustering on results of query
- Presentation showing “table of contents” and current focus

- Lloyd Rutledge
  ACM Hypertext 2003
Fishing boats are lying at anchor in the surf before Scheveningen. They are 'pinks', flat-bottomed boats with no keel and a broad curved prow. They were used in the herring fishery. The boats would be dragged along the beach by horses. Scheveningen did not yet have a harbour in the nineteenth century. To the left is a pink on dry land, surrounded by fisherfolk, mainly women with baskets of fish. A strong breeze is blowing and the breakers are capped with white foam. Mesdag was skilled at catching the feeling of a rough day at
Explicit Discourse

– Fixed discourse:
  • DISC – uses annotated multimedia repository + domain ontology and discourse knowledge
  • discourse knowledge = set of rules (genre, narrative units...)

– Dynamic discourse:
  • VoxPopuli: argument generation in video

– Role of structured progression
Fixed Discourse

- DISC
- Rijksmuseum repository of media items
- Semantic graph is not enough
  Rembrandt married—to Saskia
  also need discourse structures for deriving grouping, ordering and priorities
- Biography template created
  painter is—a profession

- Stefano Bocconi, Joost Geurts
  ISWC 2003
Rembrandt Harmensz. van Rijn

Clair-obscur (French) and chiaroscuro (Italian) both mean 'light-dark'. Both terms are used to describe strong contrast of light and dark shading in paintings, drawings and prints. Although the effect had already been used for many years, the term only came into fashion in the late sixteenth century. Originally, the word came from Italy. The painter Caravaggio (1573-1610) made chiaroscuro his trademark. He was a master at painting illuminated scenes in dark settings.

Self Portrait (1628)
Dynamic Discourse

- Vox Populi: Argument generation in video

- Database of video clips

- Annotated with topic and agree/disagree

- Argumentation model (Toulmin)

- User specifies query and video sequence

- Stefano Bocconi, ICME 2005
Role of structured progression

- Mono-media cases (text or video sequences):
  - ordering for the fragments and present them

- Presentations that use combinations of media,
  - Semantics of domain and discourse need translation to *hierarchical structures* that can be expressed through *layout, navigational links* or *temporal info*.

- Intermediate format is required:
Conclusions

• From projects described we have learned:
  – distinguish stages in process
  – separate discourse knowledge
    • Fixed and Dynamic discourse
  – mappings between domain & discourse knowledge

• Scientific challenges remain:
  – Making (MM) discourse and design knowledge explicit
  – Expressing re-usable semantics of media assets
  – Architectures for multimedia presentation generation
Acknowledgments

- This research was funded by:
  - the European Commission under contract FP6-027026, *Knowledge Space of semantic inference for automatic annotation and retrieval of multimedia content - K-Space*
  - the European *ITEA Passepartout project*,
  - Dutch *BSIK MultimediaN e-Culture project*
Canonical Processes of Annotated Media Production

Lynda Hardman
Frank Nack
Željko Obrenović

http://www.cwi.nl/~lynda
Introduction

• Motivation
  – agreement on a small number of very basic processes
  – allow designers to decide which processes they will support (or not)
  – encourage system designers to provide the outputs when the processes are supported

• Application areas
  – feature extraction
  – professional news production
  – new media art
  – photo book generation
  – ambient multimedia systems with complex sensory networks

http://www.cwi.nl/~media/projects/canonical/
Describing Canonical Processes

• Canonical: reduced to the simplest and most significant form possible without loss of generality

• Describe processes in terms of
  – basic or complex process artifacts
  – actors who carry out the processes

• Descriptions are inclusive

http://wordnet.princeton.edu/perl/webwn?s=canonical
Canonical processes of annotated media production

Premeditate

Create

Construc message

Package

Annotate

Query

Organise

Publish

Distribute
Premeditate

- Intention behind media production is established
  - Harry Potter and the Order of the Phoenix
  - Security camera in Glasgow underground
  - Photos of your friend’s birthday party
  - MR scan of brain

<<process>> Premeditate

<<input>> Ideas, decisions and artifacts

<<output>>

<<involved>> 1..* Premeditate Actor

<<process artifact>> Premeditate Artifacts
Create Media Asset

- Media asset is captured, generated, transformed, combined
Annotate

- Process where annotation is created

```
<<anchor>>
Artifact Anchor

<<process artifact>>
Any Process Artifact

<<input>>

<<process>>
Annotate

<<output>>

<<annotation>>
Artifact Annotation

<<involves>>
1..*

<<process actor>>
Annotation Actor

<<process actor>>
Human Annotator

<<process actor>>
Computing Annotator
```
Semantic annotation

Any Process Artifact

Annotate

Artifact Annotation

Vocabulary

Semantic Annotate

Semantic Artifact Annotation

Vocabulary Term

describe in terms of

link
• Process where process artifacts are logically and physically packed
Query

- Process where a user retrieves a set of process artifacts based on a given query.
Construct Message

- Process where an author specifies the message they wish to convey
Organize

• Process where process artifacts are organized according to the message
Publish

- Process where final content and user interface is created
Distribute

• Process where produced media is distributed to end-users
Discussion

• Frequently asked questions
  – Complex processes, e.g. interaction
  – Changing roles of media assets
  – Further specification of canonical processes

• Towards a more rigorous formalization of the model
  – Relationship to foundational ontologies
  – Semantics of annotations, relationship with COMM
Semantic Search

Michiel Hildebrand
Jacco van Ossenbruggen, Alia Amin, Lynda Hardman

CWI, Semantic Media Interfaces
Semantic Search

- Text-based search queries
- Explicit semantics improve search results

- Many implementations
  - different types of functionality and interfaces
  - What is useful for end-users?
Semantic search survey

- 35 systems
  - Search engine, faceted browser, wiki, question answering, portal

- Analysis of search functionality and interface for
  - Query construction
  - Search algorithm
  - Presentation of search results

## Query Construction

<table>
<thead>
<tr>
<th></th>
<th>Free text input</th>
<th>Keyword, natural language</th>
<th>Single text-entry, Property specific field</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operators</strong></td>
<td></td>
<td>Syntactic disambiguation, Semantic constraints</td>
<td></td>
</tr>
<tr>
<td><strong>Controlled terms</strong></td>
<td>Disambiguate input, Restrict output, Predefined queries</td>
<td>Value lists, Faceted browser, Graph</td>
<td></td>
</tr>
<tr>
<td><strong>User feedback</strong></td>
<td>Pre-query disambiguation</td>
<td>Autocompletion</td>
<td></td>
</tr>
</tbody>
</table>
Search algorithm

• Syntactic matching
  – Exact, prefix or substring match
  – Minimal edit distance
  – Stemming

• Semantic matching
  – Graph traversal
  – Query expansion
  – RDFS/OWL reasoning
## Result Presentation

<table>
<thead>
<tr>
<th>Data selection</th>
<th>Selected values, Template, Display vocabularies</th>
<th>Visualized by text, graph, tagcloud, map, timeline, calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering</td>
<td>Content / link structure based ranking</td>
<td>Ordered list</td>
</tr>
<tr>
<td>Organization</td>
<td>Clustering by property, by result path or dynamic</td>
<td>Tree, nested box structure, clustermap</td>
</tr>
<tr>
<td>User feedback</td>
<td>Post-query disambiguation, Recommendation</td>
<td>Facets, tagcloud, value list</td>
</tr>
</tbody>
</table>
The MultimediaN eCulture project

• See
  MultimedianN E-Culture
  behind the scenes
Semantic Search

• Point in graph
• Whole graph
• Subset of graph useful for human

• Basic search in eCulture
  – http://e-culture.multimedian.nl
  http://e-culture.multimedian.nl/tutorials/
Principles of Facet Browsing

- Groups objects from different perspective
- Build constraints as you go

With thanks to Alia Amin for the slides explaining facet browsing
Group objects from different perspectives

Example: A set of paintings with these properties. How to group them?

- **Art Style:** Art Nouveau
- **Location:** Paris
- **Artist:** Gustav Klimt

- **Art Style:** Art Nouveau
- **Location:** Paris
- **Artist:** Monet

- **Art Style:** Expressionist
- **Location:** Vienna
- **Artist:** Monet

- **Art Style:** Impressionist
- **Location:** Paris
- **Artist:** Picasso
Groups of objects from different perspectives (location)

Group objects based on location:
- Group 1: Paris
- Group 2: Vienna
Group objects from different perspectives

Example: A set of paintings with these properties. How to group them?

- Art Style: Art Nouveau
  - Location: Paris
  - Artist: Gustav Klimt

- Art Style: Expressionist
  - Location: Vienna
  - Artist: Monet

- Art Style: Art Nouveau
  - Location: Paris
  - Artist: Monet

- Art Style: Impressionist
  - Location: Paris
  - Artist: Picasso
Groups of objects from different perspectives (art style)

Group objects based on art style:

- Group 1: Art nouveau
- Group 2: Expressionist
- Group 3: Impressionist
Group objects from different perspectives

Example: A set of paintings with these properties. How to group them?

- **Art Style:** Art Nouveau
  - Location: Paris
  - Artist: Gustav Klimt

- **Art Style:** Expressionist
  - Location: Vienna
  - Artist: Monet

- **Art Style:** Impressionist
  - Location: Paris
  - Artist: Picasso
Groups of objects from different perspectives (artist)

Group objects based on artist:

- Group 1: Gustav Klimt
- Group 2: Picasso
- Group 3: Monet
Build constraints as you go

All paintings which are
• Location: Paris
• Artstyle: Art Nouveau
• Artist: Gustav Klimt
Examples

- Commercial: Ebay Express
- Noncommercial: /facet, Flamenco

- Main advantage: support exploratory search
- Facet browser tutorial at CHI06 and CHI07
eCulture /facet

Pronounced and googled Slashfacet

http://e-culture.multimedian.nl/demo/facet
http://e-culture.multimedian.nl/poster/slashfacet_iswc06/
Relation search

• Interaction: eCulture

relation search

• Explicit Discourse: Vox Populi
Relation Search

• Find relations between two resources
  – What do Vincent van Gogh and Paul Gauguin have in common?

• Naive approach: Search RDF graph
  – search space too large
  – which relations are meaningful?
Meaningful relations

- Who - person
- What - object
- Where - location
- When - time

- Not explicitly search for relations
- Visualize information in a particular dimension
We perceive the relationships...

...or not:

relation search
Bringing NewsML2 into the Semantic Web

Raphaël Troncy
George Anadiotis

raphael.troncy@cwi.nl
Why Bother with Metadata?

- A News agency is a content provider
  - Content (stories, photo, video, etc.) are assets
- Metadata add value to these assets as they provide human and machine readable information about them
- Metadata is much more than just a bunch of keywords added at the end of the chain so the customer can find your image
- Metadata covers all information about an asset, which enables machines to do smart things with your assets
Why Bother with Semantics?

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: packaging the news stories, photos, graphics, audio, videos
  - For different end-user platforms (mobiles, PC, handhelds, etc.)
IPTC Metadata Standards

- **Metadata "fields"
  
  - Informal definition and guidelines to use the field according to its semantics
  
  - e.g. "Date Created": content creation date ≠ digital representation creation date

---

<table>
<thead>
<tr>
<th>Property name:</th>
<th>Creator</th>
</tr>
</thead>
<tbody>
<tr>
<td>User interface label:</td>
<td>Creator</td>
</tr>
</tbody>
</table>

**Description:**

Contains preferably the name of the person who created the content of this news object, a photographer for photos, a graphic artist for graphics, or a writer for textual news. If it is not appropriate to add the name of a person the name of a company or organisation could be applied as well.

**Note(s):**

Aligning with IIM notions IPTC Core intents to have only one creator for this news object despite the underlying XMP property dc:creator allows for more than one item to be included. If there are more than one item in this array the first one should be considered as the IPTC Core Creator value.

**XMP Schema specifications:**

- **XMP Category:** External
- **XMP Path:** dc:creator/*[1]
- **XMP Value Type:** Seq ProperName
IPTC Metadata Standards

- Metadata "values"
  - Expressed as *controlled* vocabularies (standardization bodies)
  - A vocabulary is composed of terms (flat list, taxonomy organization)
  - IPTC has defined 28 sets of multilingual News Codes
    - NewsCodes use numeric strings = language agnostic
    - Ex: Subject ≈ 1300 terms, 3 levels hierarchy in 4 languages
    - NewsCodes Viewer application View

- XML Wrapper
  - Metadata embedded in a photo: XMP
  - Metadata stored in a separate file: NewsML
Problem: XML and Semantic *)

Need for formal semantics for the content

⇒⇒⇒

World Wide Web Consortium [W3C] について

*) adapted from Frank van Harmelen
Problem: interoperability

- Different management applications may label the same field differently
  - e.g. Creator / By-Line (Author) / Author / By-Line
- The informal semantics (guidelines) of the various metadata fields prevent an automatic validation of their use

⇒ Need for formal semantics for the structure
"Oh no! Not yet another metadata standard!" Like we don't have enough of them already:
- EXIF, Dublin Core, VRA Core, IPTC Core, XMP, MPEG-7, Creative Commons, ...

But again: No single standard can cover all metadata needs

SW is a framework that could make existing metadata standards and tools interoperable ... and make them interoperable with the rest of the Web!
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
Nepal's King Gyanendra attended a Hindu festival in Kathmandu, his first public appearance since being stripped of most of his powers by parliament last month.
Use Case scenario

Q: News about the leader of the country Nepal?

The King Gyanendra of Nepal

The Prime Minister
Girija Prasad Koirala

Head State ⇔ and (King
(oneOf country Nepal, NL, ...))

Head Government ⇔ and (Prime Minister
(oneOf country Nepal, NL, ...))

Semantic Web

Country leader

Head of state

Head of Government
What we have done?

- 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:
    - A military drill for dealing with contaminations (toxic, nuclear or biological) - Photo
    - A regular meeting of the French cabinet - Photo
    - A strike in New Caledonia - Photo
    - A protest made on the Arch of Triumph in Paris, related to the Iran nuclear crisis - Photo
    - A wine makers protest - Photo
    - A meeting between the French president and Israeli prime minister - Photo
    - A senator's publicity pictures - Photo
Example 1: reasoning on the content

- Find all related news about "Nuclear"

Nucléaire → Military drill (NBC)

Arc de Triomphe protest

Nuclear → Iran nuclear crisis

Chirac – Elmer summit
Example 2: reasoning on the structure

- Find photos of Y for which the author is X?
- What the NewsML ontology provide?
  - *slugline* and *headline* are *metadata properties*, whose values are *Basic Components*
  - *creator* and *contributor* are *authors*
  - history of the description (versioning)
- No need to know the NewsML structure to answer the query
What to do with the RDF data?

- Various tools that are able to digest RDF data and provide a unified view of these data
  - FOAF Viewer
  - SIMILE project
- /facet: A Browser for Heterogeneous Semantic Web repositories
  - Faceted browser paradigm (*Flamenco*)
  - Provide a view on any RDF dataset
Conclusion

- Methods and conversion tools for bringing NewsML in the SW (RDF - compliant)
- Added-value:
  - Enhance search of news items (logical inferences on the structure and the content)
  - Enhance presentation of news items
    - Semantic media interfaces
    - Discover relations between Items / Topics / Packages
  - Semantic Content Management System
    - Keep track of provenance information
Future Work

- Making the use case scenario REAL!
  - Needs data: photos, videos, graphics, audio, textual stories!

- Implement interfaces for:
  - Browsing a News archive
  - Rendering the search results

- Establishing links between NewsML and other vocabularies
  - IPTC News Codes *versus* domain ontologies
  - NewsML *versus* DC, EXIF, MPEG-7, etc.
Formal Name: S60C1000

Name: renewable energy

Explanation: Stories about the environmental impact of renewable energy, including solar, wind, hydro, biomass and geothermal.

Translations (right click for language specific menu):
Generating video documentaries from annotated media repositories

Stefano Bocconi, Frank Nack
CWI Amsterdam
The Netherlands

Contact: Stefano.Bocconi@di.unito.it
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.
Scenarios

- Augmenting one interview with man-on-the-street opinion ("Vox Populi" documentary)

- Overview of the content of video footage:
  - Example: trailers ("Voices of Iraq")
  - Browse the content by opinion
The annotations

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

☐ Descriptive
  - Question asked
  - Interviewee (social)
  - Filmic *next slide*
Filmic annotations

Continuity, e.g.

- lighting conditions
- background sound
- gaze direction of speaker
  - left, centre, right
- framing continuity
  - close-up, medium shot, long shot
- camera movement
  - none, pan left/right, shaking, tilt up/down, zoom in/out
Statement encoding

- Statement formally annotated:
  - `<subject> <modifier> <predicate>`
  - E.g. “war 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
Toulmin model

Data → Claim

Qualifier

Warrant → Concession

Backing

Condition

57 Claims, 16 Data, 4 Concessions, 3 Warrants, 1 Condition
Analysis of the Example

Two billions dollar bombs on tents

Claim

I am not a fan

contradict

I cannot think of a more effective solution

weaken

Concession

I am not a fan of military actions

support

War has never solved anything
Facts and features

- Annotations: 1 hour annotated, 15 interviews, 60 interview segments, 120 statements
- Partially tunable: examining the Segment graph gives feedback on the quality of the annotations and the thesaurus

\[ \begin{array}{cccc}
S1 & S7 & S8 & S10 \\
S2 & S4 & S6 & S9 \\
S3 & S5 & & \\
\end{array} \]

\[ \begin{array}{c}
\rightarrow \quad = \text{support} \\
\leftarrow \quad = \text{contradict} \\
\end{array} \]
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

<table>
<thead>
<tr>
<th>Question</th>
<th>Interviewee</th>
<th>Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why did they do what they did?</td>
<td>Cameroun Parking Guard at Stamford</td>
<td>War in Afghanistan - Pro</td>
</tr>
<tr>
<td>What do you think of the casualties among civilians?</td>
<td>Lawyer in Harvard</td>
<td></td>
</tr>
<tr>
<td>What do you think of the Afghanistan war?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are the consequences of the war?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are the roots of the problem?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What do you think about the Anthrax?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Filter Options

<table>
<thead>
<tr>
<th>Age</th>
<th>Education</th>
<th>Employment</th>
<th>GeoLocation</th>
<th>Religion</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle</td>
<td>Low Educated</td>
<td>High Income Job</td>
<td>Not USA</td>
<td>Atheist</td>
<td>Female</td>
</tr>
<tr>
<td>Age</td>
<td>Medium Educated</td>
<td>Low Income Job</td>
<td>USA</td>
<td>Christian</td>
<td>Male</td>
</tr>
<tr>
<td>Teenage</td>
<td>High Educated</td>
<td>Retired Student</td>
<td>American</td>
<td>Muslim</td>
<td>Male</td>
</tr>
<tr>
<td>Young</td>
<td>Low Educated</td>
<td>Student</td>
<td>Hispanic</td>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>Old</td>
<td>Medium Educated</td>
<td></td>
<td>White</td>
<td></td>
<td>Male</td>
</tr>
</tbody>
</table>

### Strategy

- None
- Create Clash
- Create Support
- Vox Populi

### Bandwidth

- None
- Low Bandwidth
- Medium Bandwidth
- High Bandwidth

### Intercut

- True
- False

### Caption

- On (can cause problems)
- Off

Done  | Reset
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 Dutch national ToKeN I\(^2\)RP and CHIME projects.
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