

# DIGITAL - Institute for Information and Communication Technologies



Enhancing Annotations and Content Retrieval Through  
Semantic Linking

Wolfgang Halb

CADMOS Dissemination Panel, Turin, 7 December 2012

# Mission Statement of JOANNEUM RESEARCH

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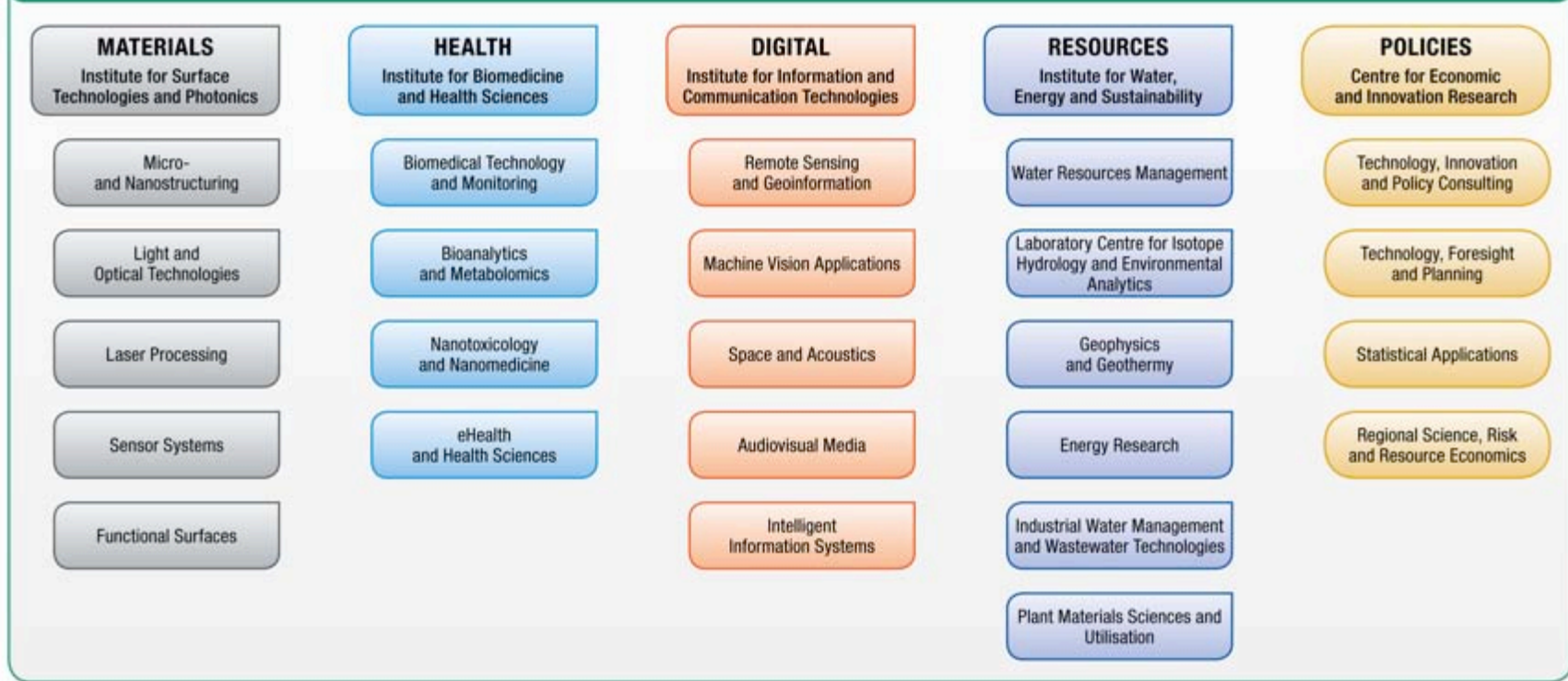
- Commitment to applied research and technology development
- Major contribution to securing the competitiveness of Styria as a centre for research, innovation and business
- Knowledge and technology transfer to business and administration through research and development
- Close cooperation with companies and institutions, Styrian universities and universities of applied sciences, institutes of the Austrian Academy of Sciences and the public sector

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- Kompetenzzentrum für wissenschaftsbasierte Anwendungen und Systeme Forschungs- und Entwicklungs GmbH<sup>1</sup>
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- Polymer Competence Center Leoben GmbH<sup>1</sup>
- Research Center Pharmaceutical Engineering GmbH<sup>1</sup>

<sup>1</sup> K1 Centre    <sup>2</sup> K2 Centre

As of: January 2011

# Linked (Open) Data Background

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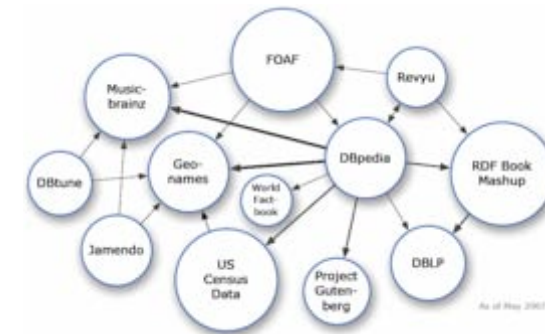
- Linking Open Data W3C SWEO community project started in 2007
- Based on ideas by
  - Sir Tim Berners-Lee (Linked Data)
  - Open Data Movement - aims at making data freely available to everyone
- LOD goal is to extend the Web with a data commons by publishing various open data sets as RDF on the Web and by setting RDF links between data items from different data sources
- Making data available for efficient human and machine consumption



# Linked Open Data

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- Based on „Semantic Web“ idea
- Linked Data Principles
  1. Use URIs as names for things
  2. Use HTTP URIs so that people can look up those names
  3. When someone looks up a URI, provide useful information, using the standards (RDF, SPARQL)
  4. Include links to other URIs so that they can discover more things



2007



2011

# CaMiCatzee (Catch Me If You Can) Proof-of-Concept

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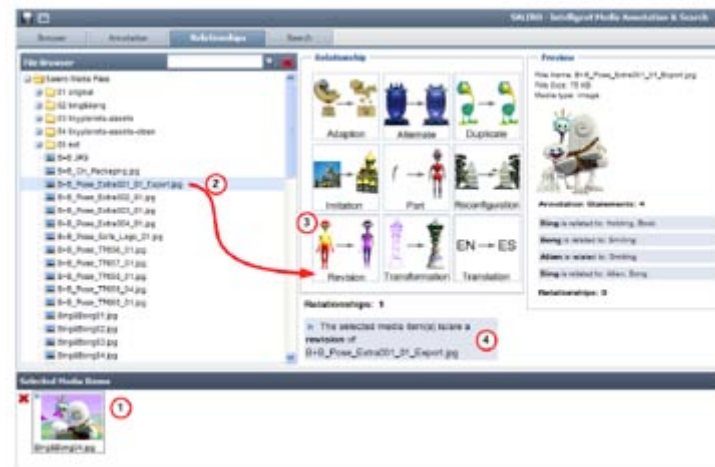
- Multimedia interlinking concept demonstrator
- Search person descriptions in flickr
- Allows flexible retrieval based on Linked Data, query can also include common sense knowledge



# SALERO Demonstrator

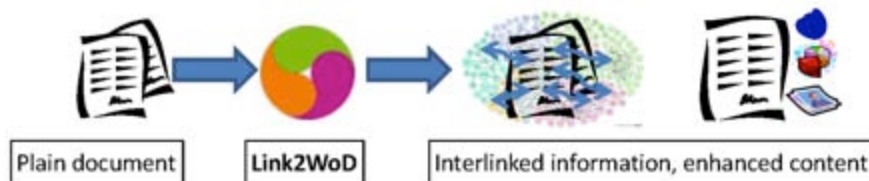
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- Generating RDF by annotating multimedia files (SALERO Intelligent Media Annotation & Search)



# Media Industry

- Several online content providers going in the direction of providing Linked Data (BBC, NYT, ...)
- Demonstrator with Link2WoD



## Semantic Text Analysis and Interlinking

The screenshot shows a web application interface. On the left, there is a text editor with a document titled 'Von Graz aus zu über 60 Destinationen'. The text contains several words highlighted in blue, indicating they have been analyzed and linked to external data. On the right, there is a sidebar titled 'Article Recommendations' which lists various related articles and images, such as 'Von Graz aus zu über 60 Destinationen' and 'Von Graz aus zu über 60 Destinationen'.



## Baseline AV analysis modules at JRS

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- Shot boundary detection
- Key frame extraction
- Key frame feature extraction, low-level features (color, texture, etc.)
- Stripe image extraction
- Camera motion estimation
- Object/concept/scenario identification (with limitations)

# Multimedia Mining Toolbox MediaFind

The screenshot shows the MediaFind application interface. It includes a 'Query Tools' panel on the left with options like 'Audio Coding', 'Media Selector', 'Clipping Object', 'Production Data', 'Shot Camera Motion', 'Similar Image / Shot', and 'Visual Coding'. The 'Similar Image / Shot' panel in the center features a video preview window showing a woman in a yellow dress, with 'Property' and 'Weight' sliders for 'Global Color Similarity', 'Local Color Similarity', 'Texture', 'Aspect ratio', and 'Image Dimension'. The 'Shot Hit List' panel on the right displays a table of search results with columns for 'Keyframe', 'File / Shot start time', 'Shot length', 'Camera motion', and similarity scores. The 'Example Catalog' panel at the bottom left shows a grid of image thumbnails. The 'Result Collection' panel at the bottom right shows a tree view of search results.

Keyframe	File / Shot start time	Shot length	Camera motion	Total	Local
	Moderatoin_Nacht.avi 00:00:00	00:29:09	Pan: Right (0) o Tilt: Up (0) o Zoom: In (0) o Roll: CW (0) o		
	Pan_Moderatoin_Nacht_Sziget 00:00:00	00:14:04	Pan: Right (0) o Tilt: Up (0) o Zoom: In (0) o Roll: CW (0) o	Total: 0.902588	Local: 0.909586
	0104 - Sziget - EU Umbrage5.avi 00:30:06	00:17:15	Pan: Right (0) o Tilt: Up (0) o Zoom: In (0) o Roll: CW (0) o	Total: 0.90163	Local: 0.90163
	Moderatoin_Boot_Nacht_aussen 00:00:00	00:06:09	Pan: Left (5) o Tilt: Up (58) ++ Zoom: In (0) o Roll: CW (0) o	Total: 0.900792	Local: 0.900792
	Moderatoin_Boot_Nacht_aussen 00:00:00	00:06:09	Pan: Left (5) o Tilt: Up (58) ++ Zoom: In (0) o Roll: CW (0) o	Total: 0.900792	Local: 0.900792

# BrandDetector



Keystone	Logo	Length	Visibility	Structure	Readability	Other Logo	Average Size
	FOSTER'S	00:00:04:11	partially occluded	hoarding	3	no	8.37 %
	FOSTER'S	00:00:04:11	fair	hoarding	30	no	7.16 %
	orange	00:00:03:15	perfect	hoarding	181	yes	2.87 %
	FOSTER'S	00:00:03:02	fair	hoarding	85	no	0.92 %
	FOSTER'S	00:00:02:00	fair	hoarding	45	yes	0.73 %
	FOSTER'S	00:00:04:00	blurred	hoarding	178	no	2.40 %
	FOSTER'S	00:00:02:16	good	panel	95	no	1.16 %
	FOSTER'S	00:00:02:16	good	panel	139	no	1.68 %

**Occurrence Controls:** [Icons for play, stop, previous, next, full screen, etc.]  
**Tracker Settings:**  Track forward  Track backward  
**Occurrence metadata:**  
 OccID: 41 Length: 00:00:04:11  
 Start: 00:00:00:00 End: 00:00:04:10 Logo: Fosters  
 Structure: hoarding Readability: 3  
 Visibility: partially occluded Other Logo: no

# Metadaten Mapping etc.

## semantic VAMP A Semantic Validation Service for MPEG-7

[validator](#)  
[references](#)  
[contact](#)  
[disclaimer](#)  
[FAQ](#)

1. Type the MPEG-7 Document URL:

or use the following demo example

2. Select MPEG-7 version:

MPEG-7 v1 (2001)  MPEG-7 v2 (2004)

3. Select profile:

DAVP  TRECVID  AVDP

4. Select semantic validation type:

Profile validation (default)  Temporal validation

Presto
PRIME

[Home](#)
[Mapping Visualization](#)
[Semantic Converter](#)
[Semantic Validation](#)

**Semantic Converter**

Input format:  Dublin Core  MPEG-7  W3C MA  P/META

Output format:  Dublin Core  MPEG-7  W3C MA  P/META

Convert from MPEG-7 to Dublin Core: itrai-0033-nk0610.mp7

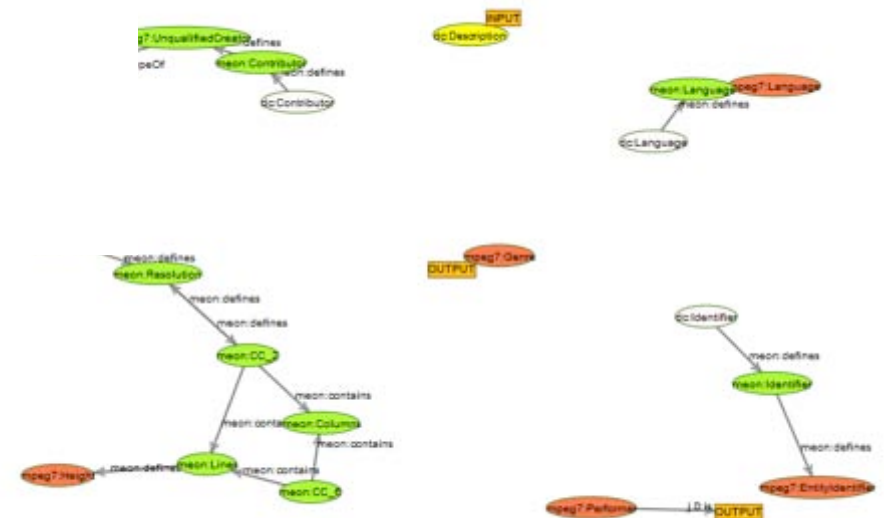
Steps:  
 Input files was: [input file \(mpeg7\)](#)

**1. Create firing templates based on ontology:**

```

<xsl:template match="//mpeg7:Creator[mpeg7:Role[@href='urn:mpeg:mpeg7:cs:RoleCS:2001:PRODUCER']]
/mpeg7:Agent[@xsi:type='PersonType']">
<xsl:call-template name="Mpeg7_PersonType_TaggedText">
<xsl:with-param name="tag">dc:creator</xsl:with-param>
</xsl:call-template>
</xsl:template>

<xsl:template match="//mpeg7:Creator[mpeg7:Role[@href='urn:mpeg:mpeg7:cs:RoleCS:2001:PRODUCER']]
/mpeg7:Agent[@xsi:type='OrganizationType']">
<xsl:call-template name="Mpeg7_OrganizationType_TaggedText">
<xsl:with-param name="tag">dc:creator</xsl:with-param>
</xsl:call-template>
</xsl:template>
            
```



# Inspiration machine

Inspiration machine beta

rogueleadzer0 Why did the graph

joskimax RT @deeped RT @cshirky kein Produkt gefunden

YURAJOV Graph designer

kein Produkt gefunden

Bilder Personen Produkte

INSPIRE ME

Video Text Audio

Shelby Sifers - Blackberry

Billy Hime - 10 MB 181 - No iPhone News Promise

The Twilight Singers - Fat City (Slight Return)

Meine Moodboards

semantic

© 2009 Neurovation | Impressum | AGBs | Feedback | Hilfe | Share:



# Standardisation activities at JRS

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## ■ W3C

- Media Annotations WG
- RDB2RDF WG

## ■ EBU

- MPEG-7 Profile for Content Analysis in media production

## ■ MPEG

- MPEG eXtensible Middleware (MXM):  
Implementations for GenericMetadataEngine



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