Proceedings of the IATUL Conferences   2015 IATUL Proceedings

Jul 1st, 12:00 AM

Metadata of the Video Analysis of the TIB|AV Portal. Automatic Generation, Retrieval and Linked Open Data

Paloma Marin Arraiza
TIB - German National Library of Science and Technology

Sven Strobel
TIB - German National Library of Science and Technology

METADATA OF THE VIDEO ANALYSIS OF THE TIB|AV-PORTAL

Automatic Generation, Retrieval and Linked Open Data

1. INTRODUCTION

Descriptive metadata plays a key role in finding relevant search results in large amounts of unstructured data. However, there is usually little metadata available for scientific audiovisual media, making them hard to find, let alone individual sequences.

The poster presents the TIB|AV-Portal as a use case where methods for automatically generating metadata, a semantic search and cross-lingual retrieval (German/English) have already been applied. These methods ensure the better discoverability of the scientific audiovisual media hosted on the portal. Other ways of increasing the discoverability and reuse of metadata are to publish it as Linked Open Data and to interlink it with other data sets.
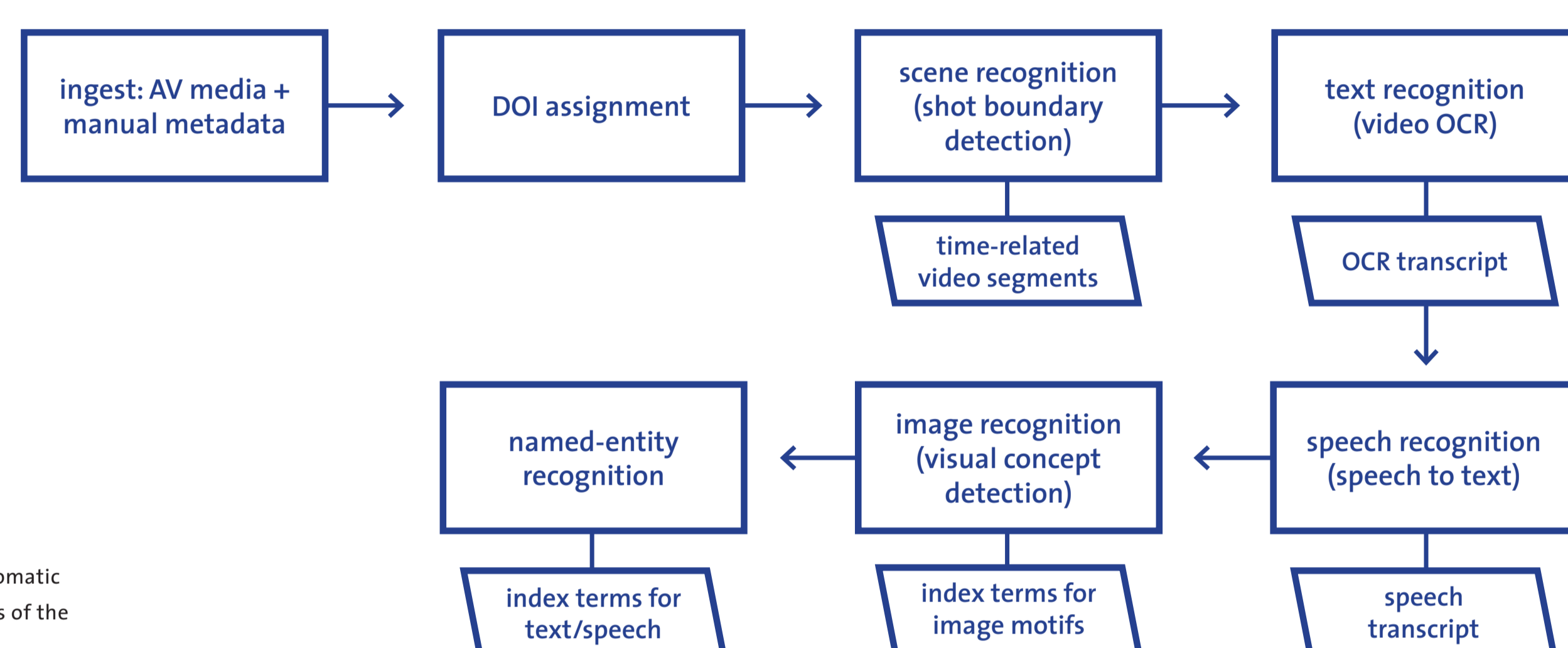
FIGURE 1. Automatic video analysis of the TIB|AV-Portal

2. THE TIB|AV-PORTAL

... is a free web-based platform for scientific videos from the fields of science and technology

... was developed by the Competence Centre for Non-Textual Materials at TIB in cooperation with the Hasso Plattner Institute

3. AUTOMATIC GENERATION

1. Audiovisual media and manual metadata are ingested
2. A digital object identifier (DOI) is assigned to each video
3. Shot boundary detection splits up the video into time-related segments
4. Video OCR converts written text in the video into the OCR transcript, which can be searched on the basis of a full-text search
5. Speech to text converts spoken language in the video into the speech transcript, which allows a full-text search
6. Visual concept detection classifies keyframes according to visual concepts such as 'experiment' or 'technical drawing'
7. Named-entity recognition links textual metadata (OCR and speech transcripts) with specialist terms of the GND ontology (63 356 GND subject headings)
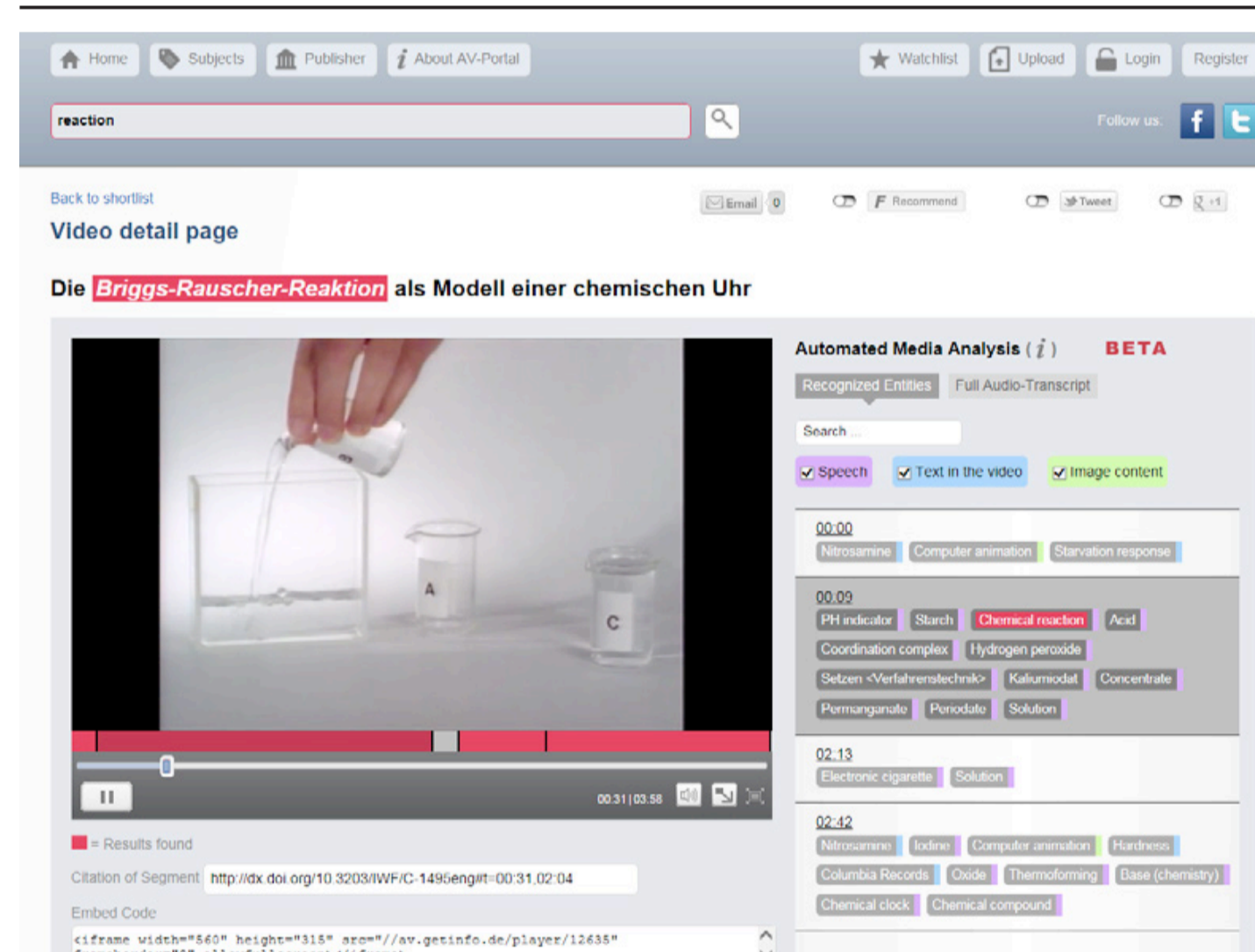
4. RETRIEVAL

FIGURE 2. Automatically indexed GND subject headings

FIGURE 3. Semantic search based on the TIB|AV-Portal knowledge base

FIGURE 4. Highlighted search terms in the speech transcript

BENEFITS OF NAMED-ENTITY RECOGNITION

→ Fine-grained descriptions of video segments enable a pinpoint segment-based search within the video content
→ Linking textual metadata with the GND ontology enables a semantic search
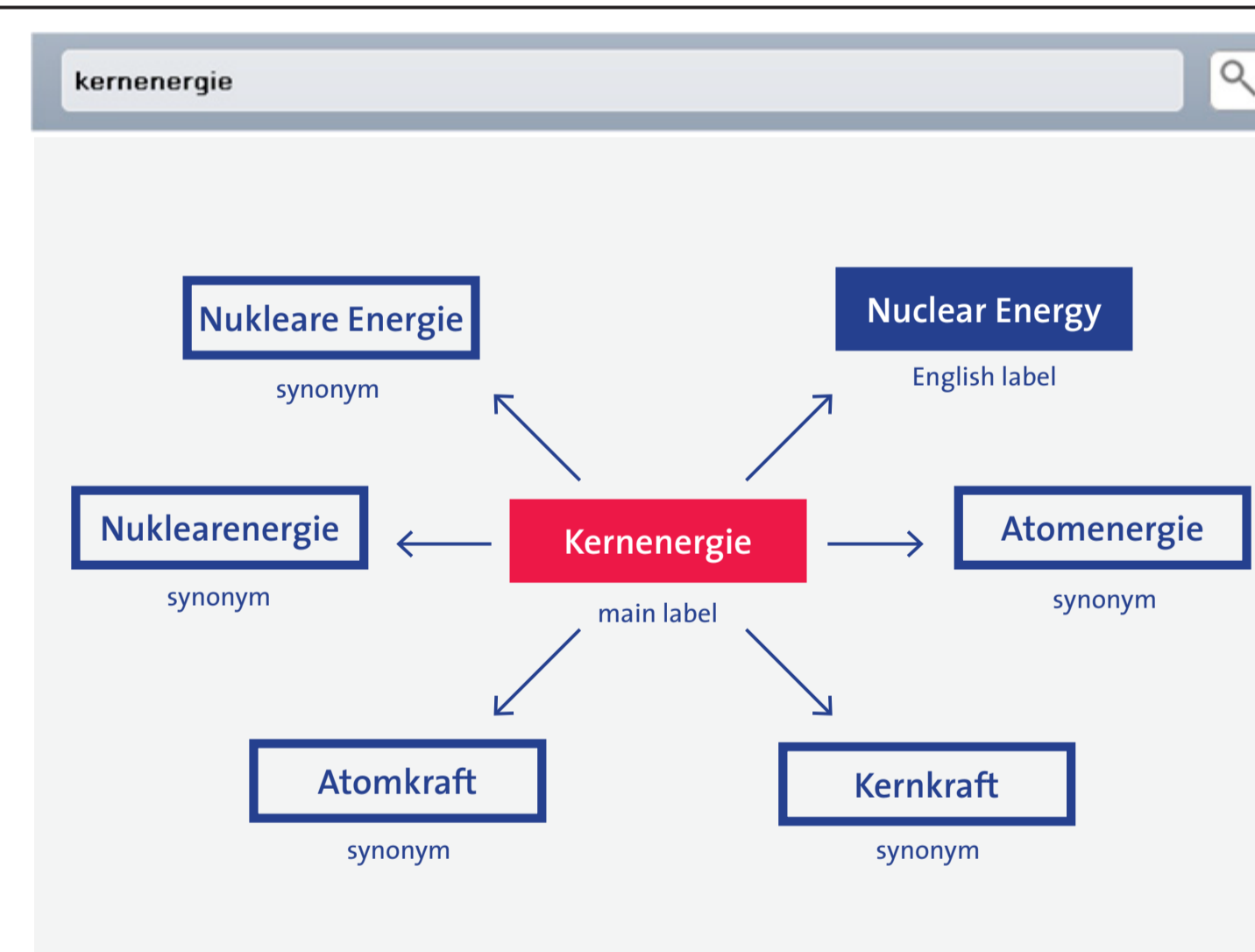
SEMANTIC SEARCH WITH CROSS-LINGUAL RETRIEVAL

When the user enters a search term, all available synonyms and English/German translations from the TIB|AV-Portal knowledge base are automatically included in the query. The TIB|AV-Portal knowledge base includes:

→ 63 356 GND subject headings plus synonyms
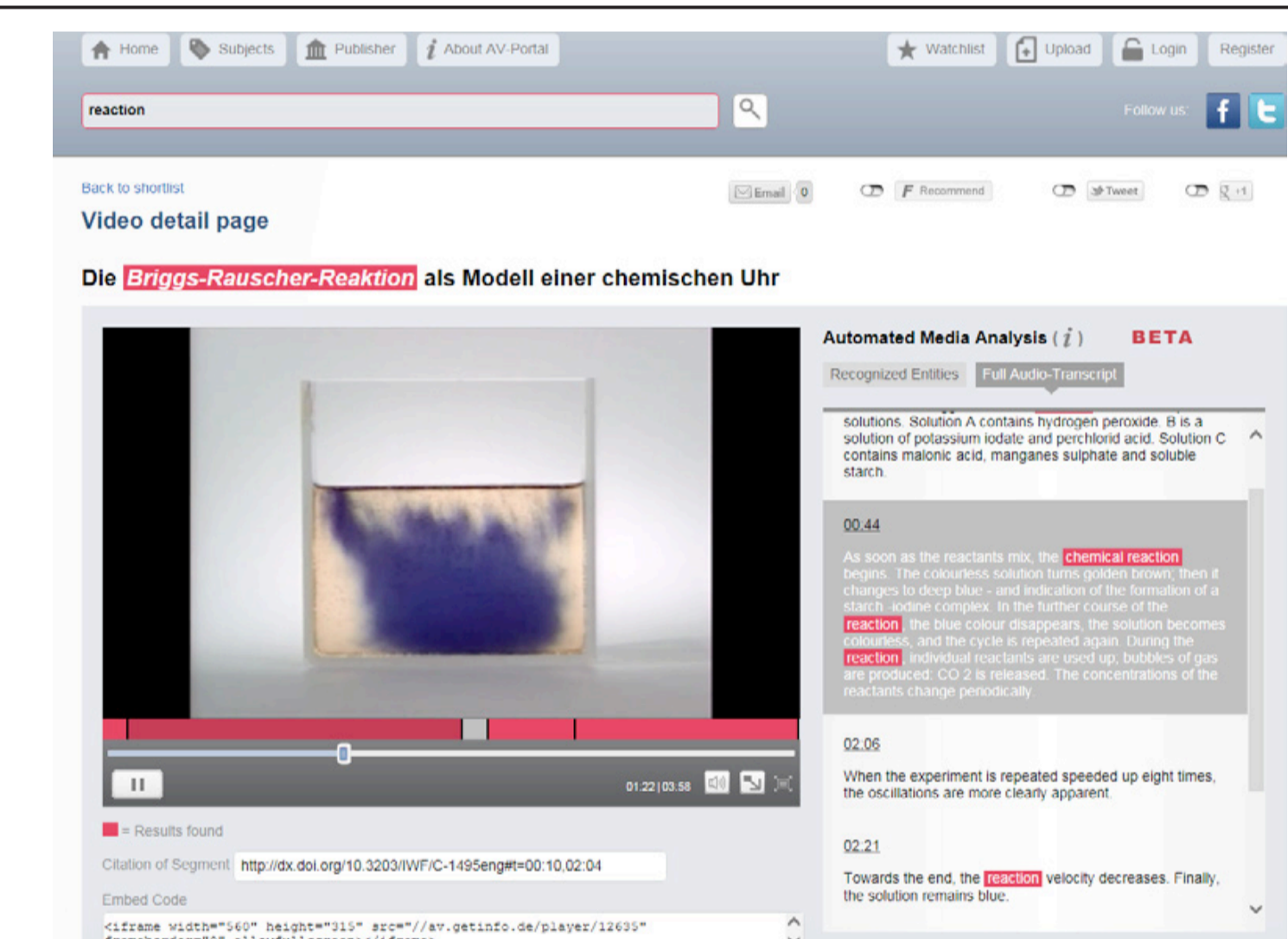→ English translations from DBpedia, LCSH, MACS and WTI Thesaurus

SEARCH IN THE SPEECH TRANSCRIPT

The speech transcript allows a keyword-based full-text search. Hits in the speech transcript are highlighted. The speech transcript has timestamps, enabling accurate searches within the video content.

5. LINKED OPEN DATA

Being structured, metadata of the TIB|AV-Portal presents a huge potential to be linked to other data sets. Moreover, weaving metadata into the Linked Open Data Cloud makes it more accessible and improves its discoverability and integration in different scenarios.

Actions we have planned to publish our metadata as Linked Open Data:

→ Have a local RDF store and use an internal ontology to relate data items
→ Map internal ontology onto other non-proprietary ontologies and vocabularies
→ Provide structured data via data dumps

http://lod-cloud.net/
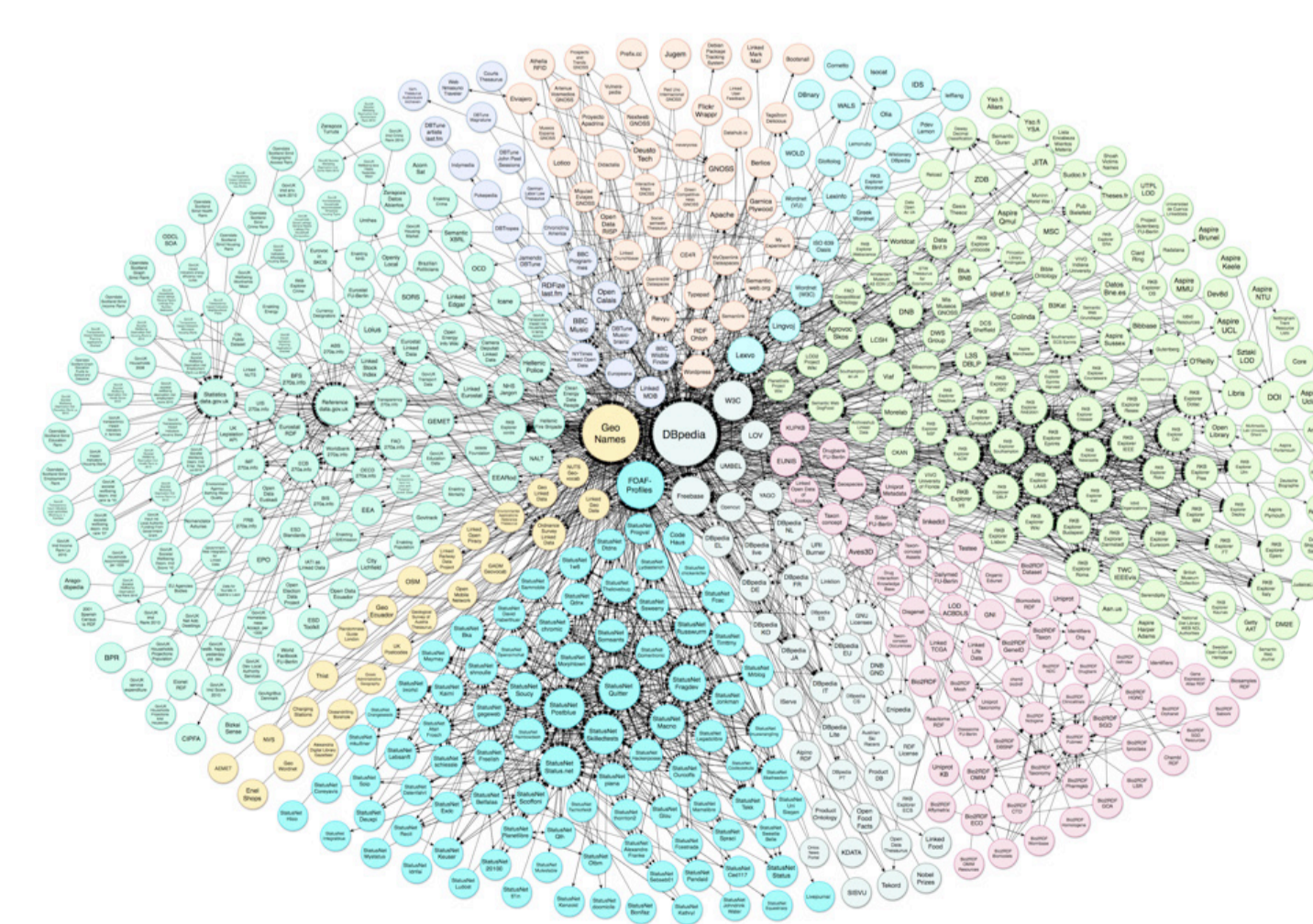
MAIN REFERENCES

1   Hentschel, C., Blümel, I., Sack, H.: Automatic Annotation of Scientific Video Material based on Visual Concept Detection. In: Proc. 13th International Conference on Knowledge Management and Knowledge Technologies, n. 16 (2013). http://dl.acm.org/citation.cfm?id=2494213.

2   Marín-Arraiza, P.; Strobel, S.: The TIB|AV-Portal as a Future Linked Media Ecosystem. WWW 2015 Companion, May 18–22, 2015. Florence, Italy, pp. 733-734 (2015). http://dl.acm.org/citation.cfm?id=2740908.2742912.

3   Plank, M., Lichtenstein, A., Neumann, J.: TIB's Portal for Audiovisual Media. Combining Manual and Automatic Indexing. In: Cataloging & Classification Quarterly, vol. 52, no. 5, pp. 562-577 (2014).

4   Strobel, S., Plank, M.: Semantische Suche nach wissenschaftlichen Videos. Automatische Verschlagwortung durch Named Entity Recognition. In: Zeitschrift für Bibliothekswesen und Bibliographie, vol. 61, n. 4-5, pp. 255-259 (2014). http://dx.doi.org/10.3196/186429501461451454

Discover more at: http://av.getinfo.de