

# Knowledge based conference video-recordings visualization

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## ABSTRACT

The advent of technologies in information retrieval driven by users' requests calls for an effort to conceive and develop semantic-based applications. In recent years the semantic web gave place for a new generation of search query engines that rely on the semantic of the documents expressed by metadata. In this paper we present a knowledge-based approach to visualizing and navigating through conference video-recordings. This approach is based on a conference ontology that models the information conveyed within a conference life cycle.

## Categories and Subject Descriptors

I.2.13 [Artificial Intelligence]: Knowledge Management—*Knowledge modeling*; I.6.9 [Simulation, Modeling, and Visualization]: Information visualization

## 1. INTRODUCTION

While recording technology is becoming easier to use and more affordable due to technological developments, an increasing number of conference and scientific events are being recorded. The information and knowledge conveyed in this large available digital content is accessible today only if considerable effort is made to conceive and develop knowledge-based applications to handle, archive, index and distribute this digital content. Many projects such as VideoLectures [1] Mediasite [2], WLAP [3], Omnisio [4], our project SMAC [5] and many others, have been designed to that end. Much effort has been done towards enhancing the interface of a conference recording visualization. Still, and to the best of our knowledge, none of them has addressed yet the issue of visualizing and navigating through the entire digital recordings of a conference. This paper presents a knowledge-based approach to visualizing and navigating through conference recordings based on a conference ontology named HELO.

## 2. KNOWLEDGE MODELING

Extraction of useful knowledge from vast and diverse sources of information is a key enabler for enhancing information retrieval

and visualization. In recent years domain-based ontologies have been used to share knowledge and link accessible data [7]. They have been adopted in order to enhance information retrieval and visualization. Many projects have been carried out to establish a conference ontology. The most relevant one, according to our work, is the SWC ontology [6] which draws heavily on ontologies developed for ESWC2006 and ISWC2006 [8]. However, these ontologies lack expressiveness towards multimedia digital resources generated during a conference - mainly video-recordings. In our work, we addressed this issue in addition to several concepts restructuring within the SWC designed concepts. We therefore proposed the High-level model for cOnference (HELO) detailed in [9]. HELO models and structures information and knowledge conveyed within a scientific conference life cycle. This information mainly concerns three entities: **Event**: Events may consist of single talks such as paper presentations, or multiple talks within a session, or industrial track or special events such as an inauguration or a software release. **People**: People in a conference may be speakers, colleagues of a speaker, participants, organizers, community member, etc. **Artefact**: artefacts are about multimedia data such as talk recordings, speaker's slide set, full papers, posters, conference proceedings, etc. HELO was built on the basis of a study set up to analyze user needs and requirements when seeking for scientific conference recordings. According to this analysis, 8 different concepts, referred as Scopes in our work, were identified: Event Scope, Location Scope, Temporal Scope, Type Scope, Person Scope, Community Scope, Thematic Scope, Media Scope. Information related to each scope comes from various sources such as automatic extraction, users' annotation, ontologies inference, etc. In order to aggregate into HELO the knowledge related to these scopes, we conceived the framework CALIMERA [10] designed for conference recordings management and retrieval. The following section presents the approach we conceived to visualize conference recordings based on the captured knowledge.

## 3. VISUALIZATION APPROACH

As stated earlier much effort has been dedicated to enhance the graphical user interface of a recorded talk replay. However none or few projects have addressed the issue of visualizing the entire recordings of a conference or a set of conferences and their correlation. To that end we put forward a novel approach to access and navigate through the conference knowledge and information. This approach is based on user requirements and the conference knowledge modeled within the HELO ontology. By using HELO for visualization we aim at offering users an interface where the descriptions are grouped based on their use. Our approach is based on the defined scopes. We propose an interactive graphical interface to visualize the recordings by

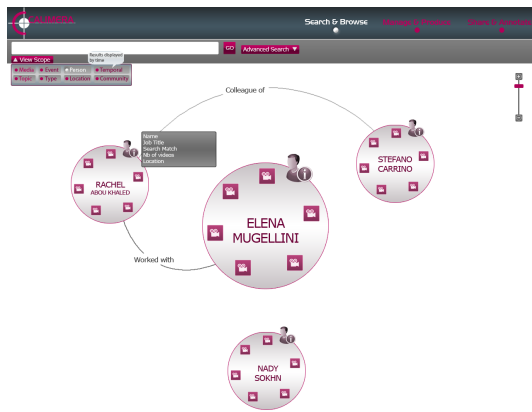


Figure 1: Person Scope view

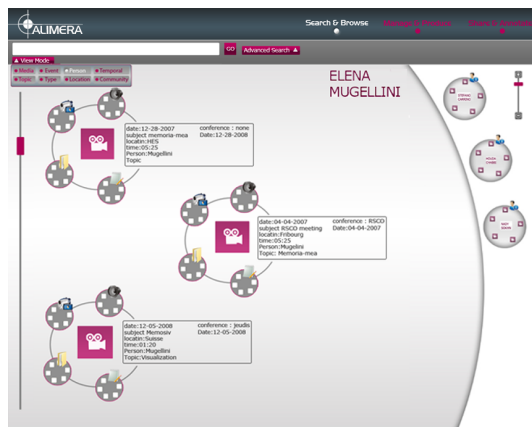


Figure 2: Person Scope Zoomed View

- **Event Scope:** It allows users to search/navigate through talk recordings of a conference related to another event such as the 20th anniversary of WWW event or co-located conference events.
- **Location Scope:** It allows users to search/navigate through the conference recordings based on granular information concerning the location such as Europe, Crowne Plaza Redondo Beach, etc. It allows as well users finding conferences held in Paris if the initial query was done for conferences held in France.
- **Temporal Scope:** It allows users to search/navigate through for conference recordings according to the time such as the year, the month, parallel sessions, etc.
- **Type Scope:** It allows users to search/navigate through recordings based on their type such as workshop, series, keynotes, etc.
- **Person Scope:** It allows users to search/navigate through recordings of people involved in a conference and their relationships and held roles within a conference such as the speaker, chairman, colleagues, etc. (Figure 1, 2).
- **Community Scope:** It allows users to search/navigate through conference recordings of communities such as laboratories, research groups, program committees, etc.

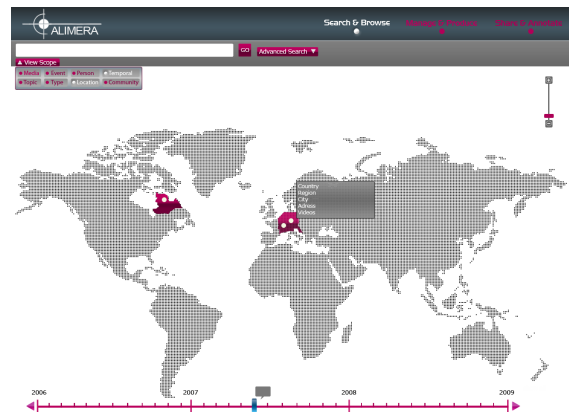


Figure 3: Temporal-Location Scopes view

- **Thematic Scope:** It allows users to search/navigate through recordings according to topics such as the topics listed in ACM taxonomy.
- **Media Scope:** It allows users to search/navigate through recordings related to a media such as paper, book, etc.

We also propose in our approach combined views such as Temporal\_Location Scope shown in Figure 3, Temporal\_Location\_Thematic Scope, Person\_Thematic, etc.

## 4. CONCLUSION

In this paper we presented an ongoing work on a novel approach for knowledge based conference recordings visualization. This knowledge conveyed within a conference life cycle has been structured and carried out within the model HELO. HELO has been used to provide users with an enhanced searching, browsing and interactive navigation interface. This interface is based on the conference knowledge defined with the following 8 Scopes: Event Scope, Location Scope, Temporal Scope, Type Scope, Person Scope, Community Scope, Thematic Scope, and Media Scope.

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