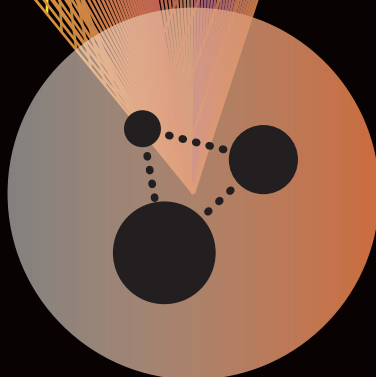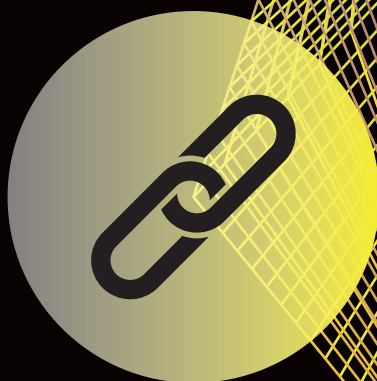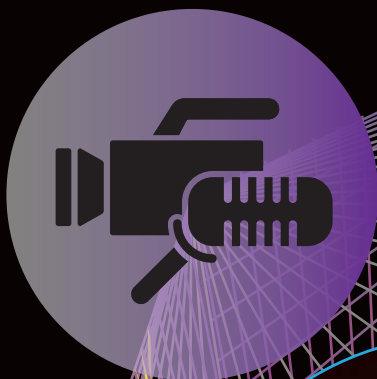# inEvent

Accessing Dynamic
Networked Multimedia Events

ENRICHING MULTIMEDIA CONTENT
THROUGH HYPER-EVENTS

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TEDˣMartigny

x = independently organized TED event

www.inevent-project.eu
inevent.klewel.com

Acquisition
Improved recording and archival processes for video conferences and lectures
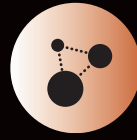
Processing
Automatically extracting meaningful information from video and audio content

Linking
Making accurate recommendations based on advanced emotional analysis

Interface
A visualization tool for intuitive navigation within and between hyper-events

One-hundred hours of video uploaded to YouTube per minute, the success of online conferences like TED, and the propagation of video conferencing in the business world have led to an avalanche of recorded multimedia data. Yet this data, by its very nature, often lacks the important metadata needed to structure databases and create meaningful links between content. The inEvent European FP7 Project, by building a collaboration between industry and academia from 2011 to 2014, has achieved a new phase in recording, processing, automatically recommending and navigating this deluge of multimedia data— through the creation of interconnected HYPER-EVENTS.

A COMPLETE SOLUTION FOR MULTI-MEDIA DATABASES The overarching goal of the inEvent project was to create an end-to-end solution for archiving and accessing these vast multimedia databases.

There is not only an exponential increase in the amount of multimedia data, but also an increasingly rich environment surrounding each recorded event. One telling example is the case of conference calls: chat messages, online comments during a meeting, schemas on a whiteboard and meeting minutes now accompany each recorded event. In the case of uploaded videos on a platform, comments and "likes" from social media can be combined with automatic transcription and video processing, to provide rich metadata for the multimedia database.

Going beyond current state-of-the-art processing and indexing, the project built intelligent databases where visualization and search tools can help the user make links to similar content based on insights and experiences, beyond the standard fields of querying.
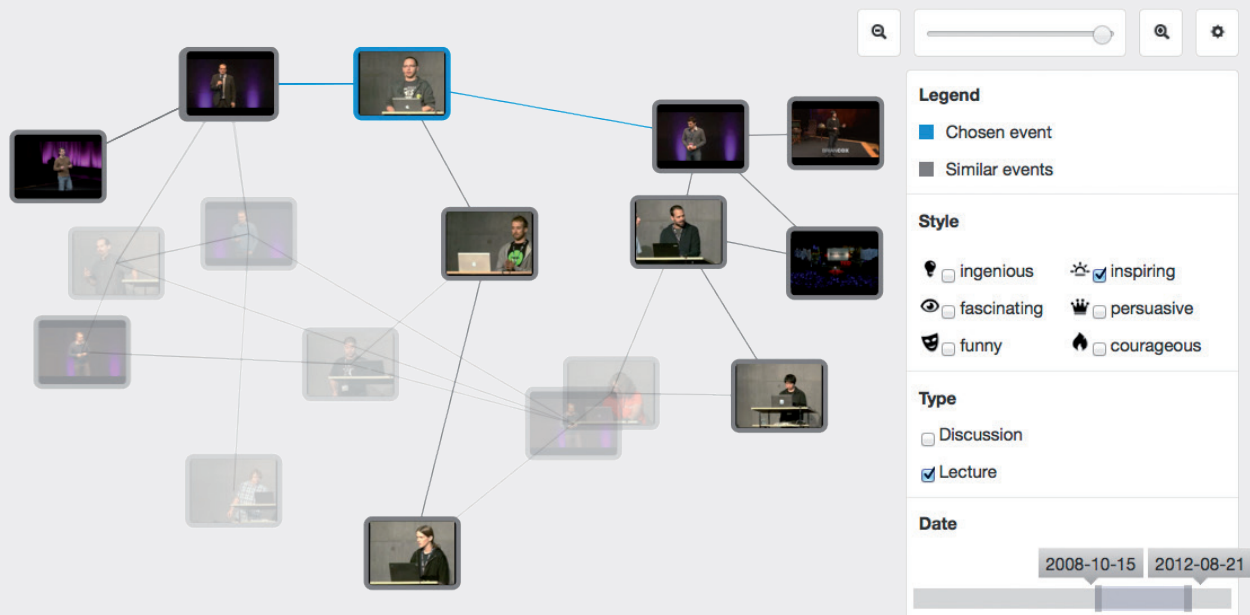
THE INEVENT PORTAL: ACCESSING HYPER-EVENTS The inEvent Portal is the culmination of three years of technical development and allows easy access to hyper-events. The easy to navigate interface, where videos and their enriched content are semantically linked, has been made possible by a veritable tour-de-force of innovation that includes automatic video segmentation, transcription of what was said, and identification of the speakers.

Hyper-Events: By analogy to hyper-text, hyper-events are defined as complex audio-video recordings that are indexed along several dimensions and linked/searched along different facets.

Navigation graph: A visualization tool to perceive hyper-links between events, the graph allows for structured as well as serendipitous navigation between events. With the possibility to filter content by date, audience perception with a single click, the portal gives an overview of the repository as well as how events are clustered together for efficient inter-event navigation.

Intra-Event Navigation: Visualization tool for navigation within one event, creating the ability to quickly find pertinent information, even within longer conferences and laughter shown the hopping interface, include inline comments during meetings.

Archiving System: A custom-built recording server, compatible with any video conferencing equipment, enhances and optimizes the data, augmenting hyper-events with additional levels of information.

Word clouds: Thanks to automatic word extraction, each event can also be presented as a series of key words for a quick overview of the content.
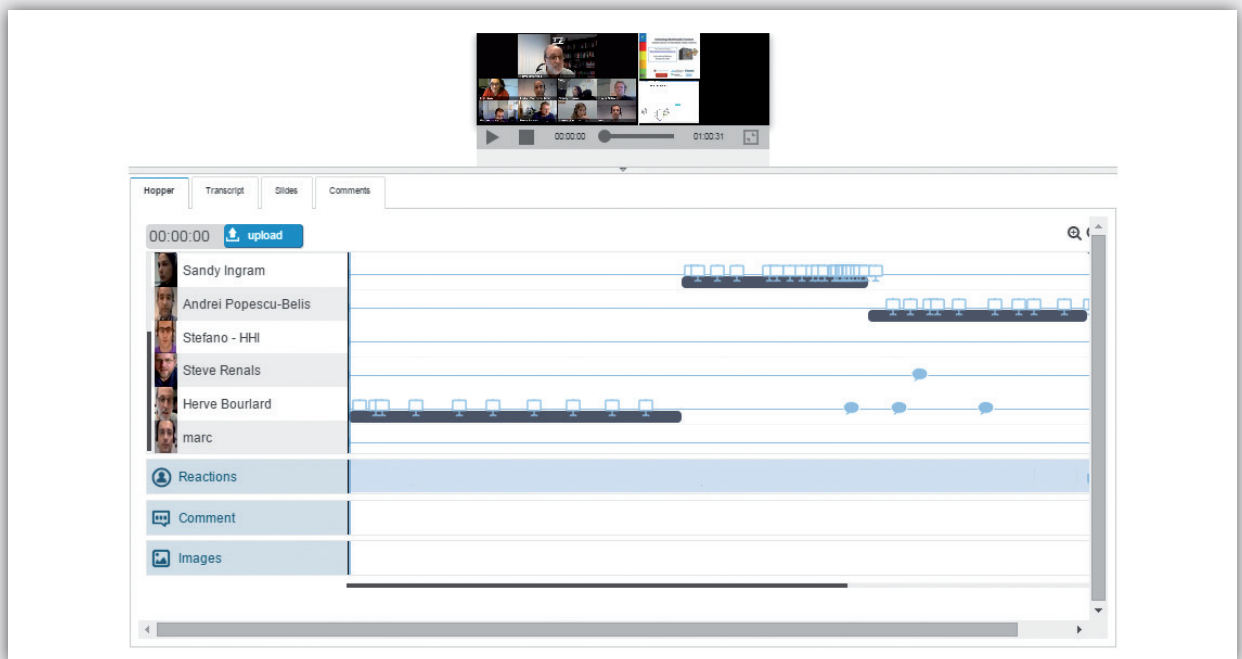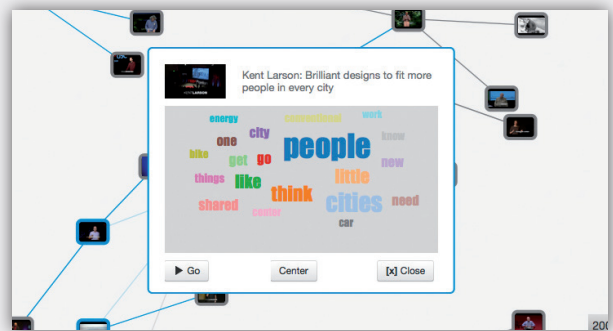
MOVING FORWARD, GOING OPEN SOURCE
The inEvent portal has undergone substantive user testing designed both to ensure its usability to meet real and immediate user needs. Our users, including Klewel and Radvision clients, have told us of its potential not just for deployments in business, but also for uses in education and social media. The project's advancements will take on a life of their own both within the industrial partners' own ecosystem and the world at large. With the decision to free the interface and media repository into the Open Source sphere, the inEvent project leaders are making a significant contribution to an ever-more multimedia driven society and taking advantage of the Open Source talent pool at the same time. It might not be long until the buzzword "hyper-event" is on the tongues of media users around the world.

NEW AND ENHANCED TECHNOLOGY FOR SEMANTIC EXTRACTION In order to create the links between the hyper-events, data was extracted from a variety of sources. For each technical challenge, an innovative step forward was made:

Visual recognition technology was developed to segment and classify the narrative structure of video. It is now possible to automatically identify and differentiate between sections of a conference.

Deep neural networks were employed for automatic audio transcription, enabling meaningful relationships between audio content to be made.

Cutting-edge natural language processing was used to qualify and quantify comments made on TED videos and accurately recommend other potentially interesting videos to users.

Advances in state-of-the-art technology were used to identify who said what and to link the speakers across different recordings.

November 2014