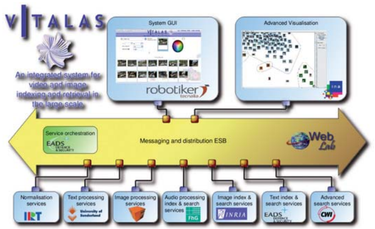
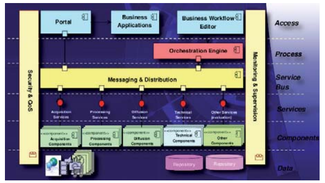
Flexible and Extensible Architecture

VITALAS is built on a flexible, Web Service architecture specifically designed for multimedia processing components. It therefore allows the integration of independently designed components, and facilitates integration of the best breed of modules. Speed of application development, integration and deployment is also significantly improved.
This approach facilitates integration with potential customers' existing systems; this is highly significant, as it means **VITALAS** can be introduced such that new customers can benefit from new functionality without disrupting existing business workflows.

As Web Services remove technical heterogeneity problems (without resolving semantic heterogeneity), we developed a specific exchange model that supports interoperability of heterogeneous multimedia components.
The framework employs secure SSL-based transport for communicating between components. Logging facilities can be used to record user activity, which can be exploited by the profiling components to ultimately provide more relevant results.



VITALAS System



VITALAS Layers

Performance and Scalability

Technologies enabling searches in very large and heterogeneous databases is one of the main target challenges of **VITALAS**.
The system validation will be performed on real and alive databases, up to 10,000 hours of television archives and 3,000,000 of political/societal news content images.

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robotiker tecnalia

INFORMATICS & TELEMATICS INSTITUTE

ina

Institut für Rundfunktechnik IRT

Fraunhofer IAIS Institut Intelligente Analyse- und Informationssysteme

EADS DEFENCE & SECURITY

CWI Centrum voor Wiskunde en Informatica

University of Sunderland

CODEWORKS

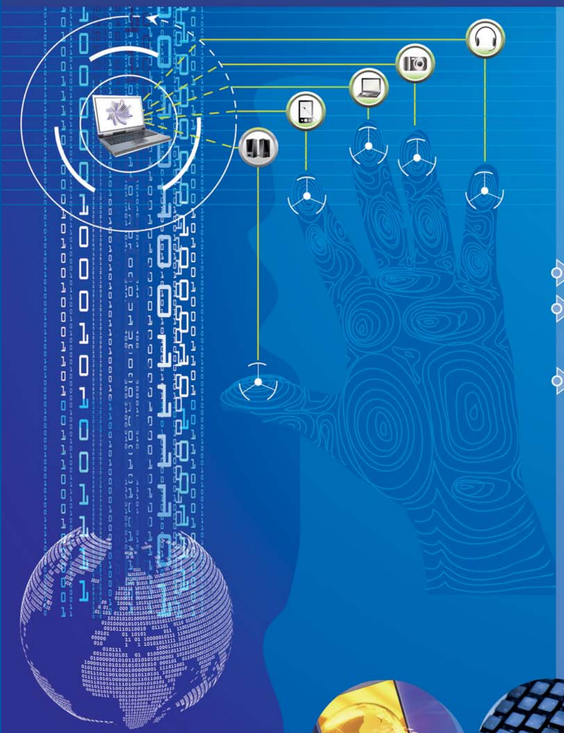
More information:
Go and visit the project web site

http://vitalas.ercim.org

ERCIM News Special September 2008

VITALAS

Video & image Indexing and reTrievAl in the LArge Scale



You are a multimedia professional

Whether you work

- as an audio-visual archivist
- in the audio-visual broadcasting industry
- in a commercial image supply agency

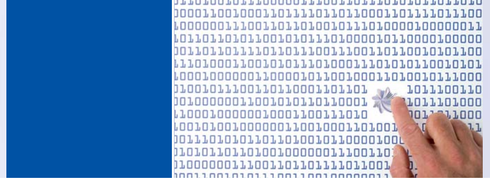
VITALAS
brings advanced audio visual search, indexing and annotation technology to your fingertips.

Next Generation of Multimedia Search Engine

VITALAS is an integrated project funded by the IST 6th Framework Programme of the European Commission

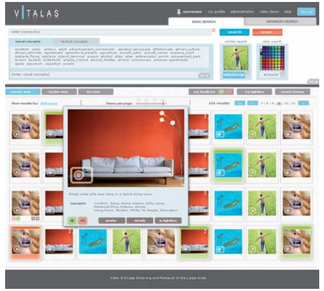
VITALAS Core Strengths

- Cross-Media Indexing and Retrieval
- Automatic Annotation
- Performance and Scalability
- Advanced Visual Interfaces
- Flexible and Extensible Architecture



VITALAS Objectives

VITALAS is a use-case driven project that aims to deliver a pre-industrial prototype allowing intelligent access to large scale multimedia professional archives, through personalised services coupled with new technological functionalities.



VITALAS Search page

The **VITALAS** system technology is envisaged to be a B2B tool which develops innovative services, with a clear potential to be adopted by a larger public and to be re-used by consumers demanding robust multi-media search engines.

The main **advantages of VITALAS** over existing technologies are:

(i) its **provision of automatic annotation functions**
(ii) its **use of innovative interfaces for searching in large audio visual archives,** and
(iii) its **capacity to perform personalised searches for each and every user.**

VITALAS offers personalisation that allows the system to adapt to a user's context of operation. Knowledge about the users and their goals is key to retrieve the most relevant documents for a particular context.

This results in a system that can be customised according to the needs of a specific user.

VITALAS is the Next Generation of Multimedia Search Engine

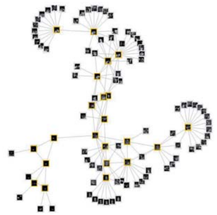
VITALAS enables content-based retrieval and browsing of very large audio and visual datasets without pre-existing metadata, through different advanced technologies:

- Automatic retrieval of spoken words through advanced syllable-based speech recognition
- Automatic annotation through generic "object" recognition allowing post-editing of multimedia content
- Content-based filtering, re-ranking and browsing of visual contents
- Automatic structuring of video streams
- Automatic duplicates and near-duplicates retrieval

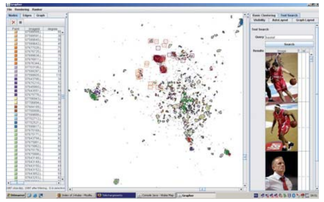
Advanced Visual Interfaces

VITALAS identifies the most relevant document set in an interative process, and prioritises the manipulation of results sets. To facilitate this process **VITALAS** improves existing approaches such as visual feedback exploiting the eye's capability to group densities perception. **VITALAS** makes more intuitive what should be done next, supports user actions, and really allows users to feel they are controlling the navigation.

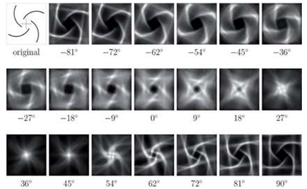
VITALAS provides visual maps to explore and navigate in corpora more easily than with classical list views. Clusters of documents are automatically generated according to proximity criteria that users can specify so as to allow quick analysis of large sets of query results. Interactive visual video structuring provides users with efficient ways of video browsing.



Local Interactive Similarity Map Navigation



Global Map Visualisation



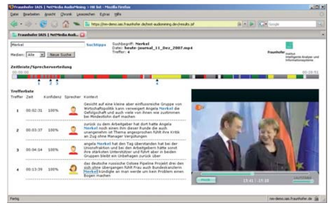
Object class recognition methods for automatic visual content annotation

Automatic Annotation

VITALAS uses advanced machine learning techniques to identify concepts based on audio, visual and textual features.

VITALAS allows for a professional annotator to be fully involved in the process. The annotator benefits because the system greatly reduces the amount of effort required by automatically suggesting classifications and annotations. The system in turn benefits and learns from the experience of the skilled professional annotator.

Vitalas makes implicit knowledge accessible



Automatic Speech Recognition

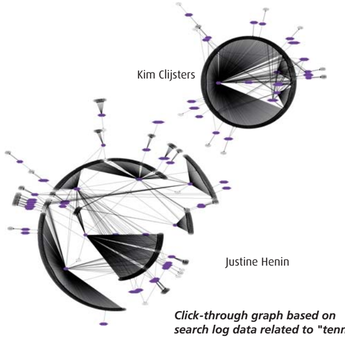
Scalable Cross-Media Indexing

VITALAS develops cross-media indexing techniques that consider all media inputs – visual, from a content-based analysis of visual features; audio analysis providing word and phonetic speech transcriptions and detecting acoustic concepts such as the gender of the speaker; and text, derived from still image captions and speech-to-text transcribed voiceovers to video content.

VITALAS is targetting to go beyond current best performance in the development of efficient scalable cross-media indexing techniques. **VITALAS** is developing machine learning methods together with new content description methods. A large set of concepts, statistically derived from image, video captions, previous search logs, and post-edited by content providers, will generate the concepts that people are searching for. The production of a large set of annotated ground-truth data needed for training and testing machine learning techniques has been facilitated by a new annotation tool, which first clusters images to speed up manual annotation.

Scalable Cross-Media Retrieval

VITALAS develops cross-media probabilistic retrieval models that combine all media inputs so as to effectively retrieve relevant images and video which satisfy users' multimedia information needs. Retrieval results are refined by taking into account the explicit and implicit relevance feedback users provide during their interactive retrieval sessions. These search interactions are logged so that they can be further exploited by the retrieval model, to enhance retrieval results based on the collective experience and knowledge of past users. Search logs are also used to adapt retrieval results to the users' context, focussing them on each user's particular interests and task at hand. The **VITALAS** cross-media retrieval techniques are currently being implemented as XQuery extensions and evaluated in international benchmarks and **VITALAS** users' trials.



Click-through graph based on search log data related to "tennis"