ITI Interactive Video Retrieval System

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ABSTRACT

This paper describes the ITI interactive video retrieval system.

Categories and Subject Descriptors

H.3.3 [**Information Search and Retrieval**]: Retrieval models.

General Terms

Algorithms, Design.

Keywords

Search engine, retrieval, visual, hybrid, video, MPEG-7

1. INTRODUCTION

The Search Engine implemented by ITI is based on an interactive retrieval model for handling video resources, integrating different search modules and supporting hybrid functionality by combining information from visual and textual queries.

2. VIDEO RETRIEVAL SYSTEM

In general, the developed application is a hybrid interactive retrieval system, combining basic retrieval functionalities with a user friendly interface supporting the submission of queries and the accumulation of relevant retrieval results.

The following basic retrieval modules are integrated in the developed search application and are combined in order to provide the hybrid functionality:

- Visual similarity search module
- Textual information processing module

The search application is built on web technologies, specifically php, JavaScript and a mySQL database, providing a GUI for performing retrieval experiments over the internet (Fig. 1). Using this GUI, the user is allowed to employ any combination of the supported retrieval functionalities to submit a query and view the retrieval results ordered according to rank. Starting with a textual query, the user can take advantage of the hybrid functionality by subsequently submitting a visual similarity search based on the initial textual results and obtain a set of results that combines textual and visual information. The storage of the desirable video shots is made possible using a storage structure that mimics the functionality of the shopping cart found in electronic commerce sites. This way, the user can repeat the search using different queries each time without loosing relevant shots retrieved during previous queries submitted by the same user during the allowed time interval.
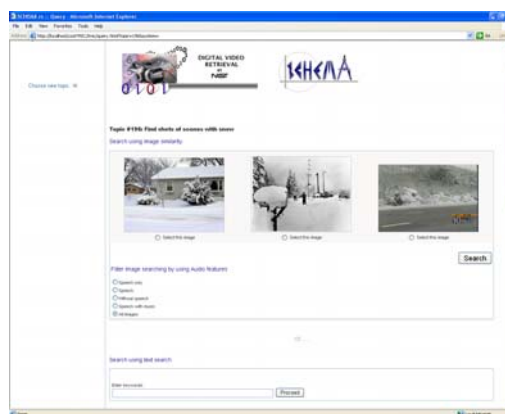
Figure 1. GUI of ITI Video Retrieval System

3. RETRIEVAL MODULES DESCRIPTION

3.1 Visual Similarity Search

In the developed application, visual similarity search is realized using MPEG-7 XM and its extensions.

The MPEG-7 XM supports two main functionalities, i.e. (a) extraction of a standardized Descriptor for a collection of images and (b) retrieval of images of a collection that are similar to a given example, using the previously extracted standardized Descriptor and a corresponding matching function. Employed extensions to the MPEG-7 XM include the *MultiImage module*, effectively combining more than one MPEG-7 descriptor, the *XM Server,* which forces the original command-line MPEG-7 XM software to constantly run as a process in the background so as not to repeat decoding of binary descriptor files during each query, and the *Indexing module*, which employs an indexing structure to speed up query execution.

3.2 Textual Information Processing Module

Text query is based on the video shot audio information. The text algorithm integrated in the search platform is the BM25 algorithm, which incorporates normalized document length, term and collection frequency in order to produce matching score for the document against the request.

4. REFERENCES

[1] V. Mezaris, H. Doulaverakis, S. Herrmann, et. al, *Combining Textual and Visual Information Processing for Interactive Video Retrieval*, TRECVID 2004 Workshop, Gaithersburg MD, USA, November 2004.

[2] J. Calic, P. Kramer, U. Naci, S. Vrochidis, et. al, *COST292 experimental framework for TRECVID 2006*, 4th TRECVID Workshop, Gaithersburg, USA, November 2006.