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Content Based Analysis Improves Audiovisual Archieve Retrieval

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ABSTRACT: Media professionals actively utilize audiovisual archives as a source for reusable material. Archives are struggling to reinvent themselves in the face of fully digital operations and growing user bases. Yet, surprisingly, very little has been done to examine how content-based video retrieval will affect the searches of professionals searching in the audiovisual archive.So the primary goal is to investigate how content-based video search which enhances the performance of traditional archive retrieval. The project complements the old, manual, descriptions of the images in the archive with new, automatically generated, labels. Then, this project measures the effect of combining them for queries typical of professionals searching an archive. The queries used present are not based on real-world queries, and generally no manually created metadata (which is often present in the real world) is included in the experiments. The project takes into account the information needs and retrieval data already present in the audiovisual archive, and demonstrate that retrieval performance can be significantly improved when content-based methods are applied to search.

KEYWORDS: Benchmark testing, content based retrieval, multimedia databases, and search problems

I. INTRODUCTION

Audiovisual archivists aimed to manually describe every shot in every video acquired by their archive. However, due to the rapid increase in the number of videos coming into the archives, it soon became apparent that it was impossible to accomplish this goal through manual labor; given the limited human resources at their disposal.Media professionals actively utilize audiovisual archives as a source for reusable material. The documentary maker requiring footage of Christmas trees from different cultures, and the news editor requiring footage of the Haiti earthquake for a news broadcast exactly one year after the disaster, can both turn to audiovisual archives to locate relevant footage themselves. In this task, they search through the archive using whatever annotations are available. Archives are struggling to reinvent themselves in the face of fully digital operations and growing user bases. Our goal is to investigate how content-based video search can enhance the performance of traditional archive retrieval. Thecomplementation of old, manual, descriptions of the images in the archive with newautomatically generated labels.The measure the effect of combining them for queries typical of professionals searching an archive also be done.Existing evaluation initiatives such as TRECVID, Video CLEF, and Mediaeval have been a valuable instigator in the advancement of techniques for content-based video retrieval. However, they are unsuited to assessing the potential impact of such techniques in a real-world setting such as the audiovisual archive.

POTENTIAL IMPACT OF CONTENT-BASED VIDEO RETRIEVAL

1.CONTENT PERSPECTIVE

The literature on content-based video retrieval and its evaluation is vast and impossible to cover here completely. Instead, we identify three dominant content-based video retrieval methods according to the source of video retrieval data: transcripts, detectors, and low-level features.Together, these three sources have been extensively utilized in the content-based video retrieval community.

Content-based video retrieval is maturing to the point where it can be used in real-world retrieval practices. One such practice is the audiovisual archive, whose users increasingly require fine grained access to broadcast television

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content.They investigated to what extent content-based video retrieval methods can improve search in the audiovisual archive.

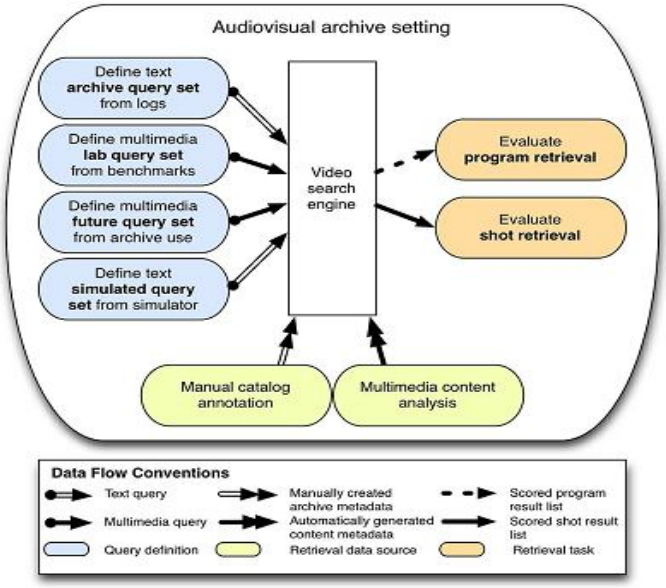

Figure.1 Potential impact of content-based video retrieval in the audiovisual archive.

II. PRACTITIONER PERSPECTIVE

With an increasing amount of digitization in the audiovisual archive, a number of crossover efforts have used archive data to aid content retrieval, or conversely have studied attitudes towards content-based video retrieval methods in the archive. In the category of using archive data to aid retrieval, Tsikrika et al. Utilize logged user result clicks in a photo graphic archive to create training data for concept detection algorithms

To the best of our knowledge, no content-based video retrieval evaluation methodology exists which is tailored to the specific needs and circumstances of the audiovisual archive. In order to better answer how content-based video retrieval can be used to answer today's real-world queries; simulated queries generated on the basis of the logged searches and purchases of professional users an extra set of 2190 is added. These allow to evaluate the impact at scale of content-based video retrieval methods on queries as they are currently issued in the archive, and also to evaluate the impact of content-based video retrieval when searching for entire programs.

III. EVALUATION METHODOLOGY

A quantitative system evaluation methodology is used to explore the potential of content-based video retrieval for enhancing search performance in the audiovisual archive. System evaluation requires a collection of documents, a set of statements of information need (called "queries" in this paper), and relevance judgments indicating which documents in the collection should be returned for each query.

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1. AUDIOVISUAL ARCHIVE SETTING

The study of content-based video retrieval in the audiovisual archive referred as "the archive".Most of its users are searching for pieces of video to reuse in new television productions, and as such have a need to find fragments of video rather than consuming entire programs. Currently the archive caters for this need by allowing users to search for programs, which can then be browsed using a keyframe viewer or a video preview so that the desired fragment can be retrieved.

2. RETRIEVAL DATA SOURCES

- Manual Catalog Annotation:the main source of retrieval data used is a collection of manually created catalog entries that describe each program. The archive structures its catalog entries using multiple information fields.
- Multimedia Content Analysis: In addition to these manually created catalog entries, we utilize state-of-the-art multimedia analysis results produced by transcript-based, feature-based, and detector-based methods identified.In contrast to the manual catalog annotations, all of the multimedia analysis sources contain noise, but are abundant and available at the shot level.

3. QUERY DEFINITIONS

There are four query sets and their associated relevance judgments are being considered at the shot level and at the program level. This allows for evaluation of the video retrieval tasks from different perspectives

- current practice in the archive
- current content-retrieval benchmarks
- content-based search.

4. VIDEO RETRIEVAL TASKS

There are two video retrieval tasks, organized by search unit are considered.

Shot Retrieval:

Users in the archive cannot currently retrieve shots, but over 66% of the orders in the archive contain requests for video fragments. Hence, shot-based video retrieval could allow these users to search through tomorrow's archive much more efficiently.

Program Retrieval:

Users in the archive currently retrieve entire programs, and tomorrow's archive is likely to continue support of this task. This requires an adjustment to the retrieval based on shot-based multimedia content analysis. To adapt the shot-level annotations for content based video retrieval, we employ an approach from the domain of passage retrieval.

IV. EXISTING SYSTEM

The existing system includes three dominant content-based video retrieval methods according to the source of video retrieval data.

- Transcripts
- Detectors,
- Low-level features

Together, these three sources have been extensively utilized in the content-based video retrieval community.

Transcript-based search: utilizes automatic speech recognition transcripts and machine translation of spoken dialog to retrieve video fragments given a textual query

.

Low-level feature-based search: allows direct access to visual information by representing key frames in terms of low-level visual descriptors, which are then matched to query images. This search method has evolved from exploiting basic

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similarity metrics between global image histograms of video fragments, to more advanced methods incorporating invariant key point descriptors.

Detector-based search: utilizes shot-based detection scores for a given human-defined concept—such as a horse, a telephone, or a musical instrument—to retrieve video fragments. It includes a set of simulated queries which allow for large scale evaluation of retrieval.

i)Archive Queries: To create a set of Archive queries based directly on today's user needs, we make use of the archive's transaction logs. In other settings, searches and clicks from transaction logs have been used to create queries and relevance judgments for retrieval experiments.

ii)Lab Queries:We create Lab queries that are representative of those used in content retrieval research by adopting them from several existing evaluation initiatives.

iii)Future Queries: Turning back to the needs of archive users, we create a set of Future queries. These are based on logged user needs, but reformulated in terms of an archive retrieval system that includes content-based video retrieval capabilities.

iv)SimulatedQueries: In this simulation approach, a given catalog entry is used to generate a simulated query. The associated program is then considered relevant to that query.

Using a simulator to create a set of queries for evaluation gives us the advantage of being able to create as many queries as we wish. However there are limitations to this approach. Namely, the simulators create relevance judgments at the level of an entire program, and are therefore not suitable for evaluating shot-level retrieval.

DRAWBACKS

- Maintain and analyze all the previous query logs are tedious if more number of records is found.
- Video frames are not converted to gray scale and then detector based search is applied, so processing time is more since all the red, green and blue components are taken and compared with user given visual image query.
- Relevant videos are found out but re-ranking them is not considered in existing system.
- Simulation query is not created in existing system.

V. PROPOSED SYSTEM

The proposed system approach covers all existing system methods. Moreover, simulation query created is carried out using combining all the query phrases given by end users. In addition, the re-ranking approach is provide to get the result which is efficient in terms of more than two feature spaces Options are provided to filter the search by various features such as file size, duration, category and quality aspects.

After retrieve the video samples for output, the proposed system also presents a flexible and effective re-ranking method, called Cross Reference-Re-ranking, to improve the retrieval effectiveness. To offer high accuracy on the top-ranked results, CR-Re-ranking employs a cross-reference (CR) strategy to fuse multimodal cues. Specifically, multimodal features are first utilized separately to re-rank the initial returned results at the cluster level, and then all the ranked clusters from different modalities are cooperatively used to infer the shots with high relevance.

MODULE DESCRIPTION

The project contains following are the module description as follows,

1.Text Based Search
2.Low-Level Feature-Based Search
3.Detector-Based Search

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4.Archive Queries
5.Lab Queries
6.Future Queries
7.Cross Referencing

1. Text Based Search

In this module, text search input is given. The video file saved with the name, title or description containing the text is retrieved as search result.

2.Low-Level Feature-Based Search

In this module, direct access to visual information by representing key-frames in terms of low-level visual descriptors, which are then matched to query images, is applied. For example, if the search requirement is texture, then if the video contains image frames of texture data, then the video is retrieved.

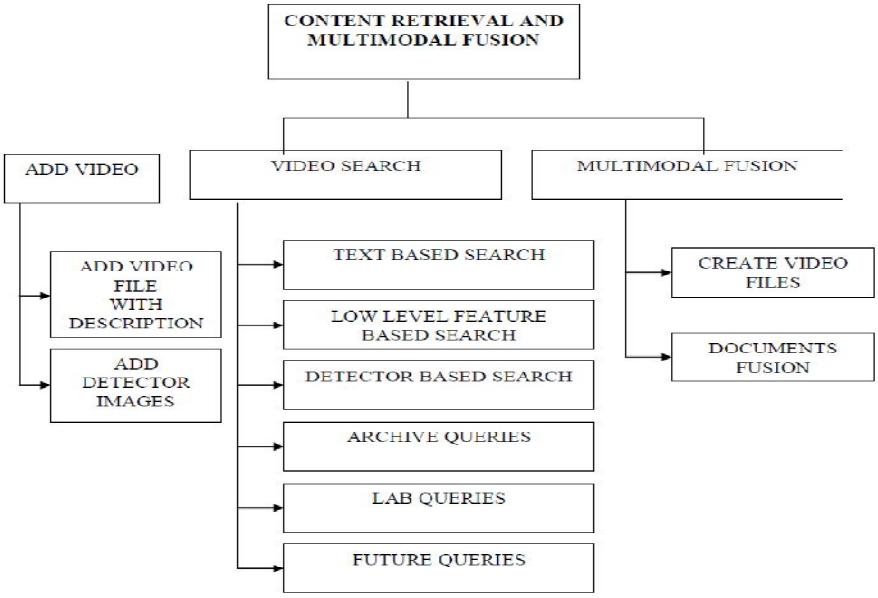

Figure 2. System f low diagram

3.Detector-Based Search

This module utilizes shot-based detection scores for a given human-defined concept—such as a horse, a telephone, or a musical instrument—to retrieve video fragments. The visual query image (like horses, telephones or others) is stored already in the database. So if video contains the frames with the given visual query image, then the video is retrieved.

4. Archive Queries

In this module, the users previous query words and the search result returned are stored in the database. In future, if the new query matches with any of these queries, then the search result is taken from those logs.

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5. Lab Queries

In this module, annotation phrase is generated and saved at regular intervals say in hours or days. Then if the query contains the annotation phrase, then the videos matching with the phrase are returned. Each annotator was able to browse through the video using transcript-based search, feature-based search, and detector-based search.

6. Future Queries

Turning back to the needs of archive users, we create a set of Future queries. These are based on logged user needs, but reformulated in terms of an archive retrieval system that includes content-based video retrieval capabilities. The video owner enter the 'N' query phrases for a single video and the user's query phrase matches with these 'N' query phrases, the videos are returned.

7. Cross Referencing

All the clusters are spitted into three sub groups as High, Medium and Low for each cluster. For example, Cluster A is spitted in A_{high}, A_{medium} and A_{Low} and Cluster B is spitted in B_{high}, B_{medium} and $B_{Low.}$

ADVANTAGES

The proposed system has following advantages

- The re-ranking result is efficient in terms of more than two feature spaces.
- Video frames are converted to gray scale and then detector based search is applied, so processing time is less.
- Simulation query creation is carried out.
- Time Reduction in searching.
- Result Efficiency is improved.
- Accurate Re-ranking of result.
- Multiple feature space based search is possible.

VI. FUTURE WORK

The project investigated how content-based video retrieval can improve searches in the audiovisual archive. The Future search engine combined manually created archive metadata and automatically generated content metadata. It applied the search engine to queries derived from the logged searches of media professionals. It is found that for queries taken directly from a search log, content-based video retrieval was of limited use.

Closer inspection confirmed that this was because search queries were being formulated in terms of the limited metadata available in the system, such as program title and broadcast date.

To enable replication of our experiments, we provide a publicly available evaluation collection that includes manually created program annotations from the archive, queries based on the information needs of users from the audiovisual archive, and their associated relevance judgments.

VII. CONCLUSION

The most important contribution of this paper, then, is a detailed investigation of how content-based video retrieval can improve audiovisual archive search. An experimental methodology has been developed that allows us to quantitatively evaluate how retrieval performance for professional searches is affected.

In addition, the purchases used as relevance judgments were regularly for entire programs, so that shot-level retrieval could not be properly assessed. Therefore we asked an archive employee to act as a query creator, studying the searched from the archive's logs and reformulating them as they might be issued in an archive with content-based video

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retrieval capabilities. We found that for these queries, shot retrieval performance was more than doubled (140% relative improvement) by combining catalog-based video search with content retrieval search.

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