Research Challenges of Library and Information Science in retrieving content based Multimedia Information

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ABSTRACT

Since several decades, the field of information retrieval (IR) has been active. Initially, IR field was concerned with effective and efficient analysis of information needs based on a set of keywords. It is still being used today in search engines. Multimedia formats are available in large amounts, including video, audio, and images. Multimedia Information Retrieval (MIR) deals with how to process queries about multimedia objects. The present paper briefly discusses the various components and classifications of the MIR. It discusses analytically LIS perspective on text, image, audio, and video information techniques. Finally, it suggested a research gap in MIR where the LIS domain seriously contributes in the development and upgrading of existing applications.

KEYWORDS: Multimedia Information Retrieval, Library & Information Science, Image Retrieval, Audio Retrieval, Video Retrieval.

1. INTRODUCTION

MIR is becoming increasingly important due to the rapid development of multimedia technologies and the proliferation of diverse multimedia content. Users seeking semantically rich, personalized, and context-aware solutions for accessing multimedia content are increasingly demanding greater sophistication from MIR solutions. In the past two decades, there has been an increase in interest in the development of MIR technology that can meet such high demands by utilizing intensive international research. Due to the explosion of multimedia information today, it has become extremely difficult to locate information of interest.

2. NEED OF THE STUDY

The retrieval term literally originated in old French and is widespread in the library science domain. The retrieval term referred to the early days of the library profession to find and discover the document in the library. The card catalogue is the tool for document retrieval in the library. This concept was a takeover by the computer science

domain-developed search engine tool to locate information over the Internet. Since then information retrieval became an active research area of the computer science domain and the Library Science domain became an active user to use these tools to provide services to end users.

The LIS domain adopted the theoretical part of the different types of IR modules in the teaching process at all the levels of the UG-PG program. The Conferences, Seminars and Symposiums were organized frequently by library science professionals to know the latest happening in the multimedia information retrieval domain. Research on the topic of MIR in the LIS domain is hardly encouraged, particularly in Indian contexts. The present study reviews the current challenges and future direction of Library and information sciences in particular to Multimedia Information retrieval system.

3. RESEARCH CHALLENGES IN TEXT RETRIEVAL SYSTEM

IRS systems retrieve documents and information based on the needs of the user community. The right information will be provided at the right time to the right user, in response to queries or topic statements that may be unstructured in nature. IR systems do not change the knowledge of the user about the subject of his inquiry; rather, they merely inform about the existence, nonexistence, and location of relevant documents.

LIS applications use classical IR techniques to automate libraries and maintain repositories. Open source and commercial applications of library automation and institutional repositories still rely on classical Boolean techniques to retrieve records from the database [1]. Application users are restricted to searching the metadata and human annotations and are not permitted to search full text. There is a lack of interest among the commercial and open-source developers of digital library applications for retrieving a document stored in repositories, and they are rather interested in storing and organizing a document for systematic browsing.

In addition to the digitized version of the back volume of journals, the commercial publisher also provides searching for full-text content from the collection of Books and Journals. A commercial publisher retrieves the information from a large database within a few seconds by using full text information retrieval techniques.

4. RESEARCH CHALLENGES IN IMAGE RETRIEVAL SYSTEM

Image processing and image analysis are very active research in the domain of computer science and electronic communication. The accessibility and availability of digital image capture devices, such as digital cameras, image scanners, and the dimensions of digital image assortment are increasing rapidly. A computer technique for exploring, searching, and retrieving images from a large database of digital images is known as image retrieval [2].

Print media libraries use image retrieval techniques on a daily basis to search large repositories for past events. Media libraries are using commercial applications to organize the archive of past articles, issues, and snaps in image format. The search functionality of this application is limited to metadata, tags, and annotation. Library professionals who work in media libraries are finding it difficult to retrieve the desired image from these repositories. Commercial applications do not support content-based image retrieval techniques to find images.

The available popular open sources Institutional Repositories allowed to collect, store, organize the images into a database, and search term is restricted to the metadata of images. The human annotation and metadata of images cannot be described in limited words as image speaks of thousand words. Since the popular search engines are already adopted content-based retrieval techniques to retrieve images from the internet. Its high time for LIS applications to incorporate content-based techniques to find the image based on color, shape, texture not limited to metadata.

5. RESEARCH CHALLENGES AUDIO RETRIEVAL SYSTEM

The audiobooks are gaining popularity among the student community, subsequently the libraries are procuring the audiobook collection. Most public libraries access the audiobook collection through subscription or perpetual mode[3]. The aggregator provides a platform for the subscription of audiobooks to public and academic libraries. The search engine provided by these aggregators is limited to bibliographic details only. Similarly, electronic media libraries use the audio retrieval technique to search past speech in the database. Users are finding it difficult to find the required audio content from the large database. The popular audio management application used by Media libraries and public libraries is not supported by content-based audio retrieval techniques and is limited to searching metadata on the audio clips.

Research on content-based audio retrieval is a neglected area in the LIS domain. Research experts do not show interest and encourage scholars to pursue research on audio retrieval. The LIS domain needs to find the research gap in content-based audio retrieval to encourage researchers to start working on improving the precision rate.

6. RESEARCH CHALLENGES VIDEO RETRIEVAL SYSTEM

The making of videos is relatively easy with digital camera and mobile technology and 500 hours of video content uploaded to the popular video sharing platform. Video search refers to providing search capabilities for the entire archive of digital video content [4]. There is a huge amount of data involved in a video making it more difficult to extract the pertinent information; additionally, algorithms must be extremely efficient to be practical on large video databases due to this high amount of data.

The challenge of storing and retrieving lecture video content has become increasingly important in the LIS environment. A lack of servers and low bandwidth of the Internet has led to most lecture video repositories and MOOCs being hosted on YouTube. The web links for MOOCs are embedded in content management systems (CMS) and e-learning applications. Most of these applications search for only metadata and human annotations associated with a particular video. A lot of applications lack search engines, and one of the clearest examples of this can be found with the SWAYAM platform. SWAYAM allows users to browse videos according to the topics that they are interested in.

The purpose of a commercial video lecture application is only to record and organize video lectures according to subject and topic. Retrieving videos from repositories is the least important concern, and applications neglect user concerns [5]. Video repositories do not provide the desired information and users spend a lot of time browsing and listening to the videos. The most popular open source institutional repository systems are only able to maintain documents and images. Retrieval is limited to metadata and human annotations. These limitations and restrictions

were addressed by the research scholar of the LIS and the university started designing and developing lecture repositories with more focus on the retrieval of the videos based on the content of these videos.

CONCLUSION

The amount of multimedia content doubles roughly every two years. Due to the rapid growth of multimedia content, creating an efficient server for storing it has become a research challenge in the field of computer sciences. Research in the areas of automatic indexing, retrieval techniques in MIR needs to be resumed in the LIS domain. An evaluation of the existing applications and theories pertaining to indexing and retrieval must be conducted; and the system should be designed so that the end-user will not have to waste time looking for information on the large database. There is not much interaction with the end-user in the computer science domain, which collects the comments at random based on anonymous feedback and builds the application accordingly. Consequently, they may not meet the majority of the requirements and require endless efforts to meet actual end-user expectations.

Professionals in LIS are better positioned to evaluate MIR applications because they interact with end users closely and are able to collect relevant feedback and expectations; consequently, the applications need to be updated and theories need to be revised.

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