Reading Movies - An Integrated DVD Player for Browsing Movies And Their Scripts

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ABSTRACT

We have built over the last few years an integrated browser and query interface for watching a movie synchronized with its script. The system is demonstrated with the movie 'The Wizard of Oz', which was fully synchronized with its script using automated tools described elsewhere. Searchable textual descriptions and synchronization metadata (hyperlinks) are generated dynamically on the server side. Video content navigation runs in a DVD player embedded in a web browser on the client side. Thus, the owner of the DVD can connect to our site and view, search and navigate the movie shot by shot.

Categories and Subject Descriptors

H.5.1 [**Information Systems**]: INFORMATION INTERFACES AND PRESENTATION—*Multimedia Information Systems*

General Terms

Experimentation

Keywords

Media Aesthetics, Film Analysis, Semantic Video Indexing, Internet, Computers in Education
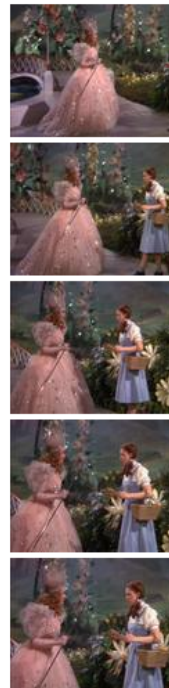
1. INTRODUCTION

The advent of DVD have already had an impact on film studies by providing high quality copies of a large number of classic movies on computers and home cinema systems. Yet, the audio and video content of a DVD can only be browsed or searched with the simplest tools (chapters or timecodes).

In the last few years, we have built the tools for synchronizing a movie with its script using a combination of video and text processing techniques [1]. The synchronized

Figure 1: Synchronized browser showing frames and script description of a shot from 'The Wizard of Oz'.

script is a very powerful source of semantically meaningful metadata, which we use for searching and browsing the movie shot by shot, rather than frame by frame or chapter by chapter. By allowing video contents to become *browsable and searchable*, those tools can be extremely useful in teaching film studies or litterature using DVDs.

2. SEARCH AND RETRIEVAL

We organized the text of the script and the synchronization metadata into a generic database schema representing the structure and the content of a movie. The standard formatting used in Hollywood scripts allowed us to extract the locations and settings, shot sizes from Close-Up to Long Shot, speakers and dialogs, action descriptions and camera movements for every shot in the movie.

Since most of the descriptions in a script are in natural

language, the movie shots can be be indexed for full-text search, using classical methods from information retrieval. For demonstrating our system, we performed a selection of the most frequent nouns and verbs appearing in each section, and ended up with the following search modes:

- Size of shot
- Scene location
- Camera movements
- Verbs in action descriptions
- Object names in action descriptions
- Place names in action descriptions
- Actor names in action descriptions

Because it is based on a relational database, the demonstrated system includes a full-fledged, boolean query interface allowing any combination of the above search modes to be combined.

3. BROWSING AND HYPERLINKING

The results of a query is composed of several, chronologically ordered video segments (shots). Since the results pages are generated dynamically by the server, we allow several modes of navigation:

- From current shot to next or previous shot in the movie
- From current shot to next or previous shot in the results list
- From current shot to next or previous shot with same actors, locations or shot sizes

Finally, the navigation can also be driven by the DVD player itself, with the script and synchronization metadata being updated each time the player is paused.

4. SYSTEM ARCHITECTURE

The demonstrated system runs in a web browser equipped with a standard embedded DVD player [1]. Thus, the movie content is accessed on the client-side, from a legally owned DVD. The script, synchronization metadata and contextual hyperlinks are assembled on the fly into pages dynamically generated by our server.

5. EDITING AND VALIDATION

A special mode of our tools is restricted to local users, and cannot be seen on our web site. This is the editing mode, which allows the synchronization metadata to be reviewed and edited. This is especially useful when earlier drafts of the script are used as metadata. In such cases, we would like to record the discrepancies between the movie as it was actually shot and the script, while restoring the true synchronization for those shots which are both in the script and the final movie. Our editing tool thus shows frames from the movie and shot descriptions from the script in separate, scrollable columns, and allows to label the shots as 'synchronized', 'not in script' or 'not in movie', and to update the synchronization data.

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[1]Microsoft's MSWebDVD for Internet Explorer and Xine Plugin for Mozilla/Netscape

6. TECHNICAL DEMO

Out technical demonstration will feature the fully synchronized script for the entire movie 'The Wizard of Oz', shot by shot, as described in [1], which can be accessed online at

`http://www.inrialpes.fr/movi/people/Ronfard/Advanced`

and used to control a DVD player on the client side, in which case the DVD can be played shot by shot, in synchronization with the script [2].

The demo will focus on two main aspects. On the one hand, we will demonstrate a web application which uses rich metadata from a distant server to drive a video player reading a DVD on a local drive. Such a system can be used to enhance fully owned video content with metadata from various sources, other than the script, and can be useful in its own right. On the other hand, we will show how a fully synchronized script is a rich source of indexing, searching and browsing information for a movie. Participants will be able to search shots in a well-known movie by choosing characters, places, objects and actions, as described in the script, as well as camera movements, shots sizes and transitions. In addition, they will be able to play the movie shot by shot while reading the script, and to jump from shot to shot using hyperlinking keywords from the script.

7. CONCLUSIONS

A movie is a rich document, whose structure and content are best described in terms of the intentions explicit in the script. We demonstrate a system which makes that script available at every step in the viewing of the movie, thus providing new and effective tools for appreciating, understanding and teaching movies. The system is based on an original architecture separating content on the client-side from metadata on the server-side.

8. REFERENCES

[1] R. Ronfard and T. T. Thuong. A framework for aligning and indexing movies with their scripts. In *IEEE Conference on Multimedia and Expo (ICME), Baltimore, USA*, 2003.