Chapter 3.6
Hyper Video for Distance Learning

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INTRODUCTION

In general, the production of hypermedia applications is a complex and expensive task, requiring both technical skills and communicative abilities (Bochicchio, Paiano & Paolini, 1999a, 1999b). Nevertheless, some specific kinds of multimedia production can give good quality results, even without specialized IT skills, at a low cost. We have concentrated on this particular field, with the goal of supplying a valid tool to teachers who want to publish their educational material easily and at a low cost.

It is easy for a good teacher to give a lesson and to explain concepts using images and slides to show objects, to write on the blackboard, and to use his body language to grab and hold the attention of his students.

In our opinion, these kinds of lessons can be effortlessly transformed into very usable and effective multimedia applications based on the video of the lesson, on a simple and regular navigation structure, and on a little set of user-friendly multimedia objects.

BACKGROUND

Various research and commercial tools, such as GRiNS (2001), MTEACH (Montessoro & Caschi, 1999), Video Madeus (Roisin, Tran-Thuong & Villard, 2000), and Real Presenter (PresenterPlus, 2001), are based on this assumption, but their effectiveness is limited by a number of issues:

- their technical complexity makes them unsuitable for a large number of teachers with low technical aptitude;
- in general, they are more data-driven than user-centered;

- the time and the budget needed for a non trivial production (e.g., a course of 10 hours or more) can be remarkable; and
- they are often limited to specific lesson styles (e.g., a frontal lesson based on MS PowerPoint presentations).

Moreover, it is well known that long video sequences (e.g., 1 hour or more) are not compelling and not interactive, and the usual linear cursors and VTR-like controls can be ineffective for navigating video sequences longer than a few minutes.

To solve these problems we created LEZI, an experimental tool oriented to the very easy production of video clips enriched with hierarchical indexes, hyper-textual elements and other multimedia objects (hypervideos).

LEZI PROJECT: REQUIREMENTS

An accurate analysis of both research and commercial tools permitted us to extrapolate the essential requirements of a good development environment based on indexed video.

Starting from these requirements, a LEZI prototype was developed at the Hypermedia Open Center (HOC) of the Politecnico di Milano, and a number of real lessons were produced and tested (Bochicchio, Paiano, Paolini, Andreassi & Montanaro, 2000). A project for a more complete prototype, called LEZI II, was then started at the SET-Lab of the University of Lecce, within a large research project focused on the development of innovative educational tools and applications.

The first fundamental requirement for LEZI is that it be very easy to use, so that it can be truly accessible even to users with very basic computer knowledge.

The second, even more important requirement is to keep production times down (ideally to about one hour of work or less for each hour of the lesson). In some cases (e.g., conferences or special events), it may be important to extend this constraint up to the "real time production" limit (i.e., the indexed hypervideo of the event should be available on CD/DVD, and online, by the end of the event itself!).

A third very important requirement is the ability to effectively support the most common "authoring situations", like those in which a teacher:

- Presents his lesson in a classroom, with a blackboard, or outside the classroom (on the field), if this is appropriate for the topic concerned
- Uses gestures to "animate" some concept expressed by "static schema" (typically a slide), so that students need to simultaneously view the two different information sources (the teacher and the schema)
- Uses his PC to explain how to use a specific computer program when the attention focus is on the display of the PC, on the voice of the teacher and, optionally, on a blackboard
- Uses his PC to make a PowerPoint presentation. The attention focus is on the display of the PC and on the voice of the teacher.

The fourth requirement relates to finding the various topics and subtopics in the lesson. The user needs a fast and effective way to find out the contents of the video lesson, so they can easily find and reach the subjects of interest without wasting time on uninteresting or already-known video sequences.

We maintain that the most common video players (Real Player, Microsoft Media Player and QuickTime player) generally do not offer an adequate solution to this problem.

The fifth requirement concerns the technical skills needed in the authoring phase; it is important to have a high-level authoring tool to simplify all technical tasks and to fully support teachers and