

MULTIMEDIA DISTANCE LEARNING WITHOUT THE WAIT

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Abstract — *Web-linked Digital Video Disks provide high-quality interactive multimedia presentations and virtual laboratories with web-access for timely materials and collaboration. We present techniques for presentation, interaction, and assessment. Experimental modules using these techniques have been developed using multimedia systems as content. New assessment methods allow materials to be dynamically modified to satisfy different learner backgrounds and objectives. A new software tool has been developed for gathering user statistics to best adapt the curriculum as well as evaluate the overall learning efficiency across diverse learner populations. The project is being disseminated at the University of Massachusetts, Springfield Technical Community College, Smith College, ENST/Paris and the National Technological University.*

Index Terms — *CD, Distance Learning, DVD, MANIC*

INTRODUCTION

Recent developments in video-based Distance Learning demand a mode of delivery [1] other than the Internet. This paper describes how CD/DVD technology can complement Internet delivery [2] to improve presentation quality, learner flexibility and ultimately, the extent and efficiency of learning.

Both synchronous and asynchronous online courses are increasingly using audio and video presentations in addition to static graphics and text materials. Video over the Internet has numerous issues related to reliable quality of service, among them are network congestion, client bandwidth and server availability. Based on user feedback [3], we have found that despite recent improvements in Internet access, many learners still have low bandwidth or unreliable connections to the Internet which result in unsatisfactory and unpredictable video quality leading to learner frustration and greatly reduced learning efficiency. In addition, learners desire the flexibility to obtain course materials using various new forms of low-bandwidth Internet access such as wireless LANs and cellular access or even with no Internet access at all.

To address this problem, we can exploit the fact that many video presentations are not required synchronously hence can be distributed using widely available, high capacity storage media. We have been developing a CD/DVD based application called CD-MANIC that is capable of delivering high quality video which is synchronized with audio and presentation slides.

The application uses Real Player as the media player and uses timing data to synchronize the media and the HTML contents (which is a part of our earlier model of distance learning over the Internet [2]). Timing data is collected when the course is being authored and contains information which CD-MANIC uses for changing slides and highlighting bullets. CD-MANIC monitors the time of the media player and changes slides or highlights bullets using the timing data and thereby synchronizing the HTML contents with the media.

Course material changes over time and redistributing a new CD/DVD for every update is an impractical solution. Instead, we post updates on the Internet. To keep track of updated course materials and also logging user behavior in a disk based system, we have developed a set of utilities that CD-MANIC uses to allow logging and updating to operate for clients with only occasional connections to the Internet.

The application also enables a link between assessment and customized curriculum [1]. The logger utility will gather assessment data, which can either be interpreted locally by the client or uploaded to a server for interpretation by a server-based "tutor" or an actual human being. Remedial materials, alternate learning approaches, additional quizzes, labs, demos, etc. can then be provided. These can either be on the CD/DVD or can be downloaded.

The pilot version of CD-MANIC is a five CD-set for a computer networking course offered this summer as well as six short modules on multimedia systems [3]. This is a work in progress and more information about its development can be found at <http://ripples.cs.umass.edu> and <http://vsp2.ecs.umass.edu/dvd/>.

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