A Web Portal for Open-Source Synchronous Distance Education

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Presentation Overview

• Introduction - motivation
• The NEW software system
• Functions of the NEW Web portal
• System demonstration
• Conclusions
Motivation

• Experience shows instructor-led education is most effective
• Synchronous course delivery from live instructors via Internet is practical today
  – Audiographic delivery is most cost-effective
  – Best when combined with asynchronous delivery
• How to make this affordable?
  – Simulteaching to in-person and Internet students
  – Dialup using inexpensive personal computers
  – Record as it is taught, for missed classes/review
  – No-cost, open-source software

Temporality of Student Interaction
NEW Software Characteristics

- Works on inexpensive PC
- Works over dialup modem
- Quality: well designed, doesn’t break
- Simple, robust, easy to use
- Scalable to large numbers of students
- Works despite firewalls and NATs
- Authentication and floor control
Modular, Open-Source Software

Recorded Sessions

Record/Playback (REC/PLAY)

Audio Send/Receive (SF)

Floor Control/Chat Client (FC)

Record/Playback Control Client (RC/PC)

User Workstation Software

Whiteboard (WBD)

TLM Client (TLMC)

Video Send/Receive (VIC)

Prepared Slides PDF, PostScript, HTML or JPEG

TCP connections

TCP or UDP tunnel

User Workstation Software

Server Software

TLM

MySQL Database

Apache Webserver

NEW webpages

Assembled Tools - Teaching

NEW

Network EducationWare
Synchronous Internet Distributed Education

THE RECORDER IS WAITING TO BE STARTED

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Requirements for Success

• We have determined through experience:
  – Entire system, from teaching to online delivery, must be designed to be simple and robust, functioning in almost any Internet environment.
  – Quality, robust software is essential.
  – System must make online teaching and learning easy
    • Comparable to teaching with overhead projector
  – Software must function over low-capacity Internet connections to reach most students.
  – Use with (not in place of) email, Website, WebCT/Blackboard.

Why a Web Portal

• Simple interface to complex functions
  – Software load and test
  – Live access in multiple forms
  – Playback access in multiple forms
  – Chat rooms

• Focal point for course management
  – For instructors, database management
  – For administrators, server and webpage management

• Scalability
Preparation for Use

• Software download
  – Installs NEW Master Client
  – Other tools loaded as required by configuration files when the system runs
  – Automatic update when tools are upgraded

• Testing connection essential for success
  – ISP support may not enable adequate delivery
  – Live and Playback mode tests
  – Playback is a mini-introduction

Live Class Interfaces

• All use the same basic client
• Student interfaces
  – Basic client
  – Listen-only client
  – Video client
• Instructor interfaces
  – Teaching configuration
  – Recording configuration
  – Extra whiteboard for classroom
Chat Room

• Floor control includes a mini-chat box
  – Typed questions/comment to instructor
  – Online student chatter
  – Available only during class

• Chat rooms based on phpMyChat
  – Works through webserver and MySQL
  – One room per course, available 24x7
  – Could do this with WebCT, Blackboard, etc.
    • But phpMyChat is Open Source and free

Playback

• Uses the same client as live class
• Streaming option
  – Recording files maintained on central server
  – NEW Player streams up to 20 parallel sessions

• Download option
  – Compressed recording file on webserver
  – After download can be played offline

• Slides also available in PDF format
Management Functions

File Upload/Download

- Whiteboard accepts PDF, JPEG, HTML
  - works with any authoring system that will print under Windows
- PowerPoint and LaTeX commonly used
- PDF slides posted for download
- Authors may upload for staff to convert
- Or convert themselves and upload to server
- After class, upload recording to server
Course Status Management

• Class files status display
  – Slides uploaded/converted and dates
  – Recordings uploaded and dates
• Student database display and update
  – Course roster
  – Add a student
  – Edit student record (most often, password)

Authentication and Security

• Early versions of NEW allowed any student to join any session
  – Soon we had hackers disrupting class
• Web portal introduced security with single logon
• PHP session variables and MySQL database are used to preclude bookmarking pages/bypassing login
• Login times out to avoid tailgating entry
System Status Management

• Administrators can
  – View or modify database for any course
  – Add a course to the system
  – Initialize a new semester
  – View live and playback server status
  – Start or stop live or playback server

NEW Information Pages

• NEW website describes development
• DEMO Portal so visitors can try NEW
• Downloads of client and server
  – Client Windows only (for now)
  – Server Unix/Linux or Windows
  – Free for all academic purposes
• Open Source available for download
  – All tools (GMU and others)
Conclusions

• Synchronous online teaching with open source software is popular with our students
  – And the faculty are growing to like it too
• Software must be simple to use and scalable
• Web portal key to ease of use
• Also to scalable management

For more information:

http://netlab.gmu.edu/NEW
NEW Welcome Webpage

Student and Instructor Options

**Student:**
- Select:
  - Preparation
    - Download/install software
    - Test your connection
  - Live Class Connection
    - Standard connection
    - Connect with video (requires broadband Internet)
    - Connect listen only
  - Communication
    - Chat room
  - Review
    - Streaming playback
    - Download playback
    - See class slides

**Instructor:**
- Select:
  - Preparation
    - Download/install software
    - Test your connection
  - Live Class Connection
    - Teach with recorder
    - Teach without recorder
    - Monitor projector
    - Monitor projector with video
    - Standard student connection
    - Student connect with video (requires broadband Internet)
    - Student connect listen only
  - Communication
    - Chat room
  - Review
    - Streaming playback
    - Download playback
    - See class slides
Instructor-Only Options

Uploads/Downloads
- Submit original slides
- Download original slides
- Submit whiteboard slides
- Download whiteboard slides
- Submit handout slides
- Submit original recording
- Submit downloadable recording

Course records
- View course status
- View course roster
- Update session/add comment
- Add student (all sections)
- Update student (all sections)