Promoting Student Engagement with Classroom Presenter

Richard Anderson
Department of Computer Science and Engineering
University of Washington

Classroom Presenter

- Distributed, Tablet PC Application
- Initial development, 2001-2002 at MSR
- Continuing development at UW
- Collaboration with Microsoft
- CP3 will be released "any day"

- Simple application
- Ink Overlay on images
- Export PPT to image
- Real time ink broadcast
- UI Designed for use during presentation on tablet
- Presentation features
  - Instructor notes on slides
  - Slide minimization

Classroom Presenter as a distributed application

- Designed as distributed application for distance learning
- Enables many scenarios
  - Mobility
  - Walking and taking notes
  - Sharing materials with students
  - Note taking
  - Classroom interaction
  - Student submissions

Ink based presentation

- Tablet PC Inking on images
- Simple pen based controls
- Whiteboard, slide extension
- Multiple views – instructor/display
  - (dual monitor)
- Multiple slides decks with filmstrip navigation

Classroom Presenter

Optimality Condition

- Opt is the maximum weight independent set of intervals \( \{ i_1, \ldots, i_k \} \)
- Let \( \{ i_1, \ldots, i_k \} \) be a set of intervals
- \( \alpha = \max \{ w(i_j) \} \) is the maximum weight
- Opt is a vertex cover of graph \((G,\alpha)\)

“Typical ink usage”
Draw a picture of something from Seattle

Student Attention vs. Time

Classroom Presenter

Deployment Studies
University of Washington
- Computer Science
  - Algorithms, Data Structures, Software Engineering, Digital Design
- College of Forestry
  - Environmental Science and Resource Management
- Classroom set of HP 1100 Tablet PCs
- Average of one activity based lecture per week
- Remaining lectures standard slide based lectures
- One to three students per tablet

Key results
- Successful classroom deployments
- Regular use throughout term
- Generally positive evaluation by all participants
- Effective tool for achieving instructors’ pedagogical goals
- Lecture – Activity model
  - Alternating lecturing with activities
  - Avg. 4 activities per lecture (50 min. classes)
  - 4 min work time, 2 min discussion time per activity
  - 50% of class time associated with activities

Classroom Activities
- Pedagogical Goals
- Classroom Activities
Discussion Artifact
- Use student generated example to explore different aspects of a topic
- Assess overall understanding
- Diagnose misconceptions

Seattle Precipitation and Temperature

Discovery Activity
- Have students derive a concept from an example

Topological Sort
- Given a set of tasks with precedence constraints, find a linear order of the tasks
  - Label vertices with integers 1, 2, ..., n
  - If v precedes w, then l(v) < l(w)

Find a topological order for the following graph

Collective Brainstorm
- Generate student ideas for discussion
- Build a list of ideas
- Analyze and evaluate responses
Special problem: Large Size

List at least three problems trees must face (& solve) because of their large sizes.

1.
2.
3.

Problem Introduction

Have students explore an instance of a problem before topic is introduced.

Determine the LCS of the following strings

BARTHOLEMEOSSIMPSON
KRUSTYTHECLOWN

Submissions

Handwriting Recognition:
Identify the following words
Order the following functions in increasing order by their growth rate:

a) \( n \log_4 n \)
b) \( 2n^2 + 10n \)
c) \( 2^{n/100} \)
d) \( 1000n + \log_8 n \)
e) \( n^{100} \)
f) \( 3^n \)
g) \( 1000 \log_{10} n \)
h) \( n^{1/2} \)

Who was Dijkstra?

- What were his major contributions?

Compute the bottleneck shortest paths:

Find a maximum flow:

Construct a maximum flow and indicate the flow value.
Determine an optimal mine

Traveling Salesman Problem

Classroom Usage

Collaboration

Anonymity
Results

- Comparison with classroom networks
  - Classroom response systems, "clickers"
  - Single display of rich responses versus aggregated, finite responses
  - Support different classroom goals
- Comparison with paper based activities
  - Most of the activities can be done with paper!
  - Improved logistics with digital system
  - Anonymity
  - Key is ability to incorporate into public display

Comparison with classroom networks

- Single display of rich responses versus aggregated, finite responses
- Support different classroom goals

Comparison with paper based activities

- Most of the activities can be done with paper!
- Improved logistics with digital system
- Anonymity
- Key is ability to incorporate into public display

Classroom Presenter 3

- 3.0 Release – any day now!
- Most significant changes from CP2
  - Support for TCP/IP networking
  - Improved ink support
  - Direct import of PPT (no need for deckbuilder)
- For more information contact
  - Richard Anderson, anderson@cs.washington.edu
  - Natalie Linnell, linnell@cs.washington.edu

Any questions?

For more information, contact Richard Anderson
(anderson@cs.washington.edu)
http://www.cs.washington.edu/education/dl/presenter/

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