

# Guided Slides: Flexible Lectures using a Tablet PC

Lester I. McCann

mccann@cs.arizona.edu

Computer Science Department  
The University of Arizona  
Tucson, AZ

Frontiers in Education  
October 24, 2008

# Outline

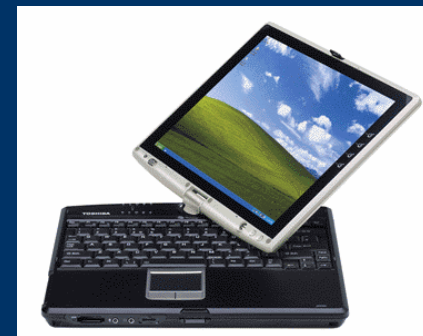
- Background and Motivation
- Creating Guided Slides
- Student Feedback
- Advice for Adopters
- Conclusion

# Motivating Idea #1: *Weird Classrooms!*



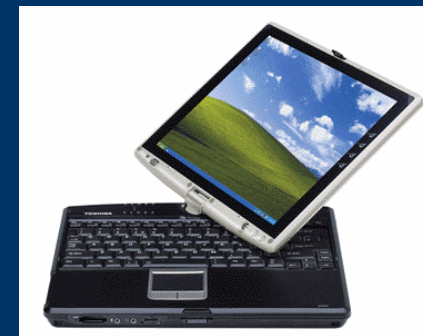
# Motivating Idea #2: *Tablet PCs*

- Because ... I had one!



# Motivating Idea #2: *Tablet PCs*

- Because ... I had one!
- Many suitable software applications available:
  - MS OneNote
  - DyKnow Vision
  - Classroom Presenter
  - Ubiquitous Presenter
  - ...

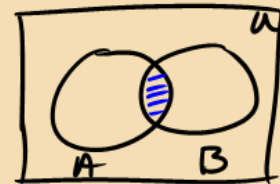


# First Try: Virtual Whiteboard

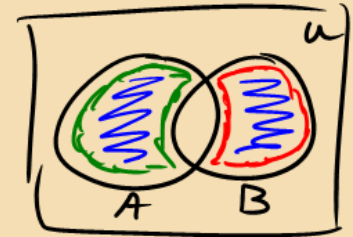
## Subsequences

Def: A subsequence is a sequence formed from a proper subset of the elements of another sequence in which relative element order is retained.

Ex:  $g = 1, 2, 2, 2, 6, 8, 8, 9$   
 $h = 2, 2, 6, 8$   
 $i = 1, 2, 8, 6, 9$  not a subsequence.



$A \cap B$



$(A-B) \cup (B-A)$   
 $C \quad D$

# First Try: Feedback

- Many positive comments; e.g.:
  - “I really liked McCann taking notes on the tablet PC and posting them. It definitely isn’t a replacement for taking your own, but it is a good reference.”
  - “He writes the notes so we can write the notes before he starts speaking.”
- No negative feedback

# Motivating Idea #3: *Guided Notes*

## Guided Notes are:

- Instructor-prepared outlines of lecture topics
  - Distributed in advance to students
  - Include wide gaps for student note-taking
  - Helps students see what they should have learned and/or what they missed



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Why not ... *Guided Slides?*

# Creating Guided Slides

1. Format slides in  $\text{\LaTeX}$  with **Prosper**
2. Convert from `.dvi` to `.pdf`
3. Use **Imagemagick** to extract `.gif` slide images
4. Import the images into **Classroom Presenter**
  - Powerpoint (PPT) slides can be imported directly

# A Word About Layout

How do you know that you have enough space?

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Practice!

The image shows two hand-drawn notes on a grid background, titled 'Matrix Fundamentals' and 'Matrix Fundamentals (cont.)'. The first note defines a matrix as an n-dimensional collection of values and shows the notation for a 3x2 matrix A with elements [4, 3; 0, 2; 1, 1]. The second note defines square matrices as those where the number of rows equals the number of columns, and defines matrix equality as having the same dimensions and equal corresponding elements.

**Matrix Fundamentals**

**Matrix**

A matrix is an  $n$ -dimensional collection of values.

Notation:

$$A = \begin{bmatrix} 4 & 3 \\ 0 & 2 \\ 1 & 1 \end{bmatrix} = \begin{pmatrix} 4 & 3 \\ 0 & 2 \\ 1 & 1 \end{pmatrix} = [a_{ij}] = (a_{ji})$$

A 3x2 matrix

**Matrix Fundamentals (cont.)**

**Square Matrices**

Matrices in which the # of rows = # of columns.

**Matrix Equality**

Matrices A and B are equal if they share the same dimensions and each pair of corresponding elements is equal.

(Printed 4-up using Adobe Reader)

# The Resulting Completed Slides

## Subsequences

### Definition: Subsequence

A subsequence is a sequence, formed from a subset of the elements of another sequence, in which the relative element order is retained.

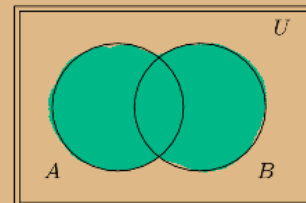
### Example(s):

→  $g$  is 1, 2, 2, 2, 6, 8, 8, 9 and  $h$  is 2, 2, 6, 8  
 Is  $h$  a subsequence of  $g$ ? **yes**

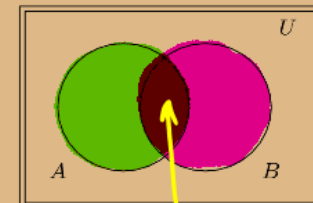
→  $\{h_n\}_{n=1}^7$ , where  $h_n = 1/n$ . Is  $1/4, 1/6$  a subseq. of this? **yes**  $1/4, 1/5, 1/6, 1/7$

Sequences & Strings – CSc 245 v1.1 (McCarthy) – p.8/19

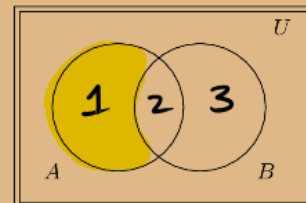
## Venn Diagrams



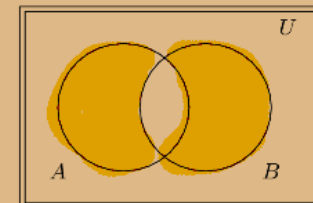
$$A \cup B$$



$$A \cap B$$



$$A - B$$



$$(A - B) \cup (B - A)$$

Sets – CSc 245 v1.1 (McCarthy) – p.10/19

# Student Feedback

- Three consecutive offerings of sophomore discrete math
- End-of-semester anonymous surveys
- Return rates:

	Class #1	Class #2	Class #3	Overall
Returned Survey	45	70	58	173
Took Final Exam	56	80	72	208
%	80.4	87.5	80.6	83.2

# Concern #1: Slide Availability

Question: Are students accessing the completed slides?



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Answer: Yes!

- Every one of the 173 students knew that the slides were available
- 95.6% accessed them at least once
- 53.2% accessed them 10 or more times

## Concern #2: Impact on Attendance

Question: Does posting completed slides encourage absenteeism?

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Question: Does posting completed slides encourage absenteeism?

Answer: No!

‘Posted slides made me  likely to go to class.’

	Class #1	Class #2	Class #3	Totals	%
More	6	10	7	23	13.5
No more / no less	38	50	45	133	78.2
Less	1	9	4	14	8.2
Overall	45	69	56	170	99.9 <sup>†</sup>

<sup>†</sup> Percentages do not total 100.0 due to rounding.

# Concern #3: Note-taking Habits

Question: Will students still take their own notes?

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Answer: Yes (mostly)

	Class #1		Class #2		Class #3		Totals	
	$\Sigma$	%	$\Sigma$	%	$\Sigma$	%	$\Sigma$	%
Detailed	26	57.8	32	45.7	25	43.9	83	48.3
Occasional	7	15.6	23	32.9	15	26.3	45	26.2
No Notes	12	26.7	15	21.4	17	29.8	44	25.6
Totals	45	100.1	70	100.0	57	100.0	172	100.1

# Concern #3: Note-taking Habits (cont.)

Question: If boards / PPT were used?

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Question: **If boards / PPT were used?**

Answer: **Varies.**

	(Whiteboards)		(.PPT/DocCam)		(.PPT)		(#2 & #3 Only)	
	Class #1		Class #2		Class #3		Totals	
	$\Sigma$	%	$\Sigma$	%	$\Sigma$	%	$\Sigma$	%
More Notes	17	37.8	8	11.4	5	8.6	13	10.2
Fewer Notes	3	6.7	19	27.1	18	31.0	37	28.9
Same Amount	25	55.6	43	61.4	35	60.3	78	60.9
Totals	45	100.1	70	99.9	58	99.9	128	100.0

# Making Slides Available Early

‘If completed slides are available in advance, I would attend ...’



# Making Slides Available Early

'If completed slides are available in advance, I would attend ...'

	Class #1		Class #2		Totals	
	$\Sigma$	%	$\Sigma$	%	$\Sigma$	%
More Often	3	6.7	5	7.1	8	7.0
As Often	35	77.8	58	82.9	93	80.9
Less Often	7	15.6	7	10.0	14	12.2
Totals	45	100.1	70	100.0	115	100.1

# Making Slides Available Early (cont.)

– Class #3 only –

Should completed slides be available in advance?

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– Class #3 only –

Should completed slides be available in advance?

Yes:	19	(32.8%)
No:	39	(67.2%)
<hr/>		
Total:	58	(100.0%)

# And the Future?

Question: Should I continue lecturing with a tablet?

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Answer: Yes!

	Class #1		Class #2		Class #3		Totals	
	$\Sigma$	%	$\Sigma$	%	$\Sigma$	%	$\Sigma$	%
Yes	45	100.0	69	98.6	55	96.5	169	98.3
No	0	0.0	1	1.4	2	3.5	3	1.7
Totals	45	100.0	70	100.0	57	100.0	172	100.0

# Guided Slides in Other Courses?

- Surveyed 62 students in a subsequent data structures / algorithms course:

‘Should I use the tablet in this class, too?’

Yes:	47	(75.8%)
No:	5	(8.1%)
No Opinion:	10	(16.1%)
<hr/>		
Total:	62	(100.0%)

# In Progress: Guided Slides → Guided Notes

- Over half (54.1%) have told us that they would use guided notes, at least occasionally, if they were available on-line.
- Putting it to the test this semester.

topic04notes.pdf (application/pdf Object) - Mozilla Firefox

http://www.cs.arizona.edu/classes/cs245/fall08/guidednotes/t...

### Specious Reasoning: The Bear Patrol

Homer: Ah, not a bear in sight. The Bear Patrol must be working like a charm!

Lisa: That's specious reasoning, Dad. [...] By your logic, I could claim that this rock keeps tigers away!

Homer: Um-huh, and how does it work?

Lisa: It doesn't work. [...] It's just a stupid rock. [...] But I don't see any tigers around here, do you?

Homer: Lisa, I'd like to buy your rock.

From: The Simpsons, "Much Apu About Nothing" (Season 7, Episode 151, Production Code 3F29)

### Specious Reasoning: The Bear Patrol (cont.)

**Definition: Specious Reasoning**

Question: Where is the error in Homer's logic?

# Advice for Potential Adopters

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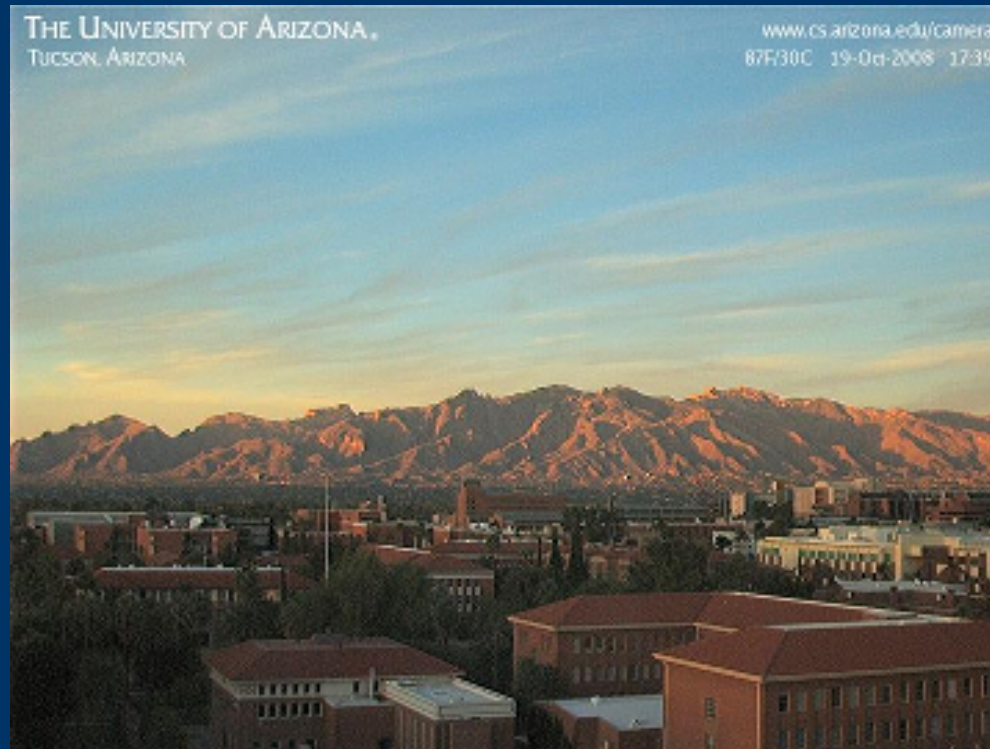
- Consider using a textbook as an arm rest
- Carry a video extension cable
- Need to save time? Pre-write content
- Choose color palette with projector in mind
- Remove background color before posting slides
  - **Imagemagick's** `convert` utility works well

# Conclusions

- Guided slides take roughly as much time to create as PPT slides
- Students have time to take notes
- Posting completed slides after lectures does not appear to adversely affect attendance
- Slides can be used as guided notes with little extra effort
- Students overwhelmingly support guided slides

“Every professor should do this!”

# Any Questions?



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These full-screen PDF slides were created in  $\text{\LaTeX}$  using the `prospect` class.