CONTEXTS OF COMPUTING EDUCATION

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"I think there is a world market for about five computers."

—Thomas J. Watson, 1943
(Chairman of the Board of IBM)
“...over 1 billion PCs in use today.”

“Today, there are more computers than people on your campus.”
— Deepak Kumar, 2007.
Intention to major in CS compared to degrees granted

Goal: To produce women who have a full grasp of modern technology, the role it plays, and its implications in society, regardless of their discipline of study.

Implication: CS has emerged beyond its traditional perception as a subset of Math and Engineering to the very core of a liberal arts education.
Curriculum Design

- Less prescriptive
- More student-centered
- More interdisciplinary electives
- Flat pre-requisite structure
Minor in Computational Methods

Accessible to *any* student on campus

4 CS courses (CS1, CS2, Disc. Math, +1)
2 computational courses outside CS

Requires buy-in from Dept. X!
Computing Contexts in CS1 &

- Robots
- Multimedia
- Visualization
- Games
- Social Networking
- Others
Contextual Courses

- CS1 with Robots & Multimedia
  IPRE initiative [www.roboteducation.org](http://www.roboteducation.org)

  Seven course offerings at Bryn Mawr and GeorgiaTech since Spring 2007

- CS1 with Visualization
  Two course offerings (2006, 2008)

- Elective on Game Design & Programming
  Included non-majors (2006, 2008)
Contextual Approaches to CS1

- Contexts make learning experience more engaging and exciting
- Still learn core CS concepts
- View CS as a type of logic and problem solving; requiring patience and thought
- Discover that CS is applicable to the real world
Gender Issues

- Differences in male and female interests
- Inherent obsession for speed & efficiency
- Social relevance of computing/software

- Introducing gaming into the curriculum has a real danger of discouraging female enrollment
- Significant student frustration over software and tools
# Computers > # People?
Contexts of Computing

# Computers > # People?

Declining Interest in CS
Contexts of Computing

# Computers > # People?

Declining Interest in CS

Flexible Curriculum
Minor in Computational Methods
Contexts of Computing

# Computers > # People?

Declining Interest in CS

Flexible Curriculum
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Teaching Contexts
- Robots
- Multimedia
- Visualization
- Games
- Social Networking
- ...
Other important

- CS != Programming
- Computing as a medium for creativity
- Computing as a social activity
- Performances vs Competitions
- Nature of examples, assignments, projects
- Create accessible, engaging environments for new, diverse population of students
Example CS1 Exercise
Example Elective

- Computational Models
- Computational Linguistics
- Emergence
- Game Design & Programming
- Search Engines and Information Retrieval
- Geographical Information Systems
- Recent Advances in CS (topics vary)