

# CS111 Fall 2007

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## Survey Says...

- What year are you?
- Who has used a computer regularly?
- Who has used the Internet regularly?
- Who has made a web page?
- Who has written a program?
- Why are you taking this course?
- What is computer science?

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## Discussion: What is Computer Science?

- Know any famous computer scientists?

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## What is Computer Science?

“Computer Science is no more about computers than astronomy is about telescopes.” --Edsger Dijkstra

- What is computable?
- How can we compute X most effectively/efficiently/accurately?
  - Optimize speed, space using optimum data structures, algorithms
  - Accurate modeling of “world”

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## Computer Science Fields

### Systems

- Architecture
- Operating systems
- Networks
- Distributed and parallel systems
- Databases
- ...

### Software

- Compilers
- Graphics
- Software engineering
- Software testing and verification,
- ...

### Theory

- Algorithms
- Theory of computation
- ...

### Other

- Artificial intelligence
- Robotics
- Natural language processing
- Bioinformatics
- Visualization
- Numerical analysis
- ...

- Often research involves combinations of these fields
- Not just programming!
  - But programming is a foundation to do much, much more!

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## What I do **not** do as a computer scientist

- Fix hardware
- Fix Microsoft Windows (or other operating systems) problems
- Fix Microsoft Office (or other desktop applications) problems

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## What I do as a computer scientist

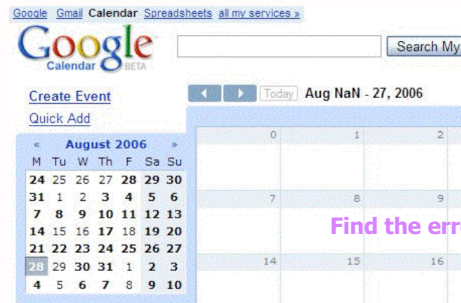
- Interests: Software testing, empirical studies, distributed systems
- Focus: Automated web application testing

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## What I do as a computer scientist



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## Matt Welsh

- Assistant professor at **Harvard University**
- Research: distributed systems and networking
  - Sensor networks to monitor volcanoes
- Wrote *Running Linux*



Prof. Welsh  
at Volcán  
Reventador  
in Ecuador

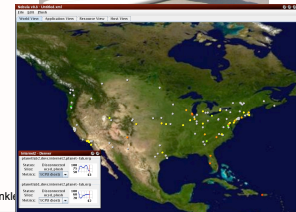
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## Jeannie Albrecht

- Assistant professor at **Williams College**
- Research: managing software that is running and communicating on computers around the world
- Hobbies: surfing, ultimate, rugby

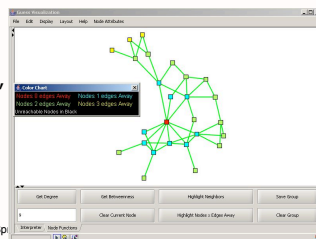


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## Jeff Forbes

- Assistant professor of the practice at **Duke University**
- Research:
  - computer science education, intelligent control and robotics, reinforcement learning, and social networks
  - **HarambeeNet**: CS education via social networks

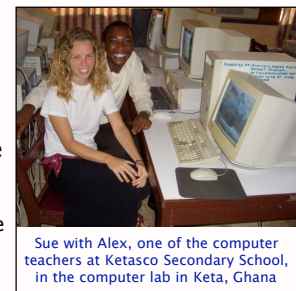


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## Sue Lister

- Recent graduate of the **University of Delaware**
- Double major in CS and Psychology
- Interested in decreasing the division between the technological haves and have nots
  - Only 3% of Africans have Internet access
  - Cell phones are commonly used



Sue with Alex, one of the computer teachers at Ketasco Secondary School, in the computer lab in Keta, Ghana

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## Nina Bhatti



- HP Labs Principal Scientist
- Leads design for novel mobile technologies
  - System for matching your foundation, using pictures from your cell phone

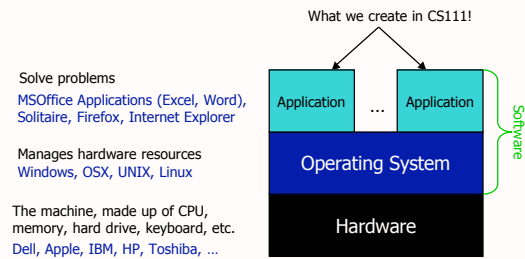


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## Basic Computer Architecture



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## Computational Problem Solving 101

- Computational Problem
  - A problem that can be solved by logic
- To solve the problem:
  - Create a **model** of the problem
  - Design an **algorithm** for solving the problem using the model
  - Write a **program** that implements the algorithm

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## Computational Problem Solving 101

- Algorithm: a well-defined recipe for solving a problem
  - Has a finite number of steps
  - Completes in a finite amount of time
- Program
  - An algorithm written in a **programming language**
  - Also called code
- Application
  - Large programs, solving many problems

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## What This Course Is About

- CS111
  - Introduction to problem solving
    - Algorithms, dealing with information
  - Introduction to programming (Python)
  - Introduction to UNIX/Linux
  - Introduction to broader issues in CS
- CS101
  - Survey of computer science topics: algorithms, circuits, low-level instructions, web/databases

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## What to Expect from this Class

- First programming course
- Lots to learn!
  - Introductions to a lot of new ideas
- Different way of thinking
  - Similar yet different from math
  - May get stuck but ask me for help!

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## Class Details

- Course web page
  - <http://www.cs.wlu.edu/~sprenkle/cs111>
  - Check frequently for updates
- Monday, Wednesday, Friday lectures
  - Slides posted after class, in handout, PDF format
  - Don't copy down slides verbatim
    - A lot isn't on the slides
    - Use slides later to review
- Tuesday labs
  - Programming projects due on Friday

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## Class Details

- 3 Exams
  - 2 Midterms (see schedule online for dates)
  - Final
- Discussion of broader issues in CS
  - Articles about computer science's effect on *everything*
  - Write up on blog, due Fridays
  - Discussion on Fridays
  - Opportunities for extra credit for finding, reading, summarizing additional articles

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## Instructor Responsibilities

- Keep your interest in CS
- Prompt, constructive feedback on assignments
- Office hours:
  - Wednesday: 3:30-4:30 p.m.
  - Thursday: 12:30-3:30 p.m.
  - Email for appointments
- Respond within 24 hours to emailed questions

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## Student Responsibilities

- Check W&L email and course web page frequently for updates
  - Review entire syllabus online
- Attend and participate in class and lecture
  - Mandatory attendance
  - Be respectful to other students
- Arrive promptly to lecture/lab
- Turn off cell phone
- **Be patient, flexible, and learn from mistakes**

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## Honor System

- You may discuss programming assignments informally with other students
  - Sharing a solution is an honor violation
- Students should know where to draw the line between getting legitimate outside assistance with course material and outright cheating
  - Students who obtain too much assistance without learning the material ultimately cheat themselves the most
- If you have any uncertainty about what this means, consult with me before you collaborate.
- All written assignments should be done individually.

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## Your TODO List:

- Review the course web page
  - Midterm dates
- Read Chapter 1 of Text Book
  - Only skim 1.4
- Due next Friday
  - First CS issues reading/writeup
  - Tuesday's lab/assignment

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