

# **CSE 143**

## **Lecture 24**

Computer Science  
Goodbye, world!

slides adapted from Marty Stepp, Hélène Martin, and Benson Limketkai

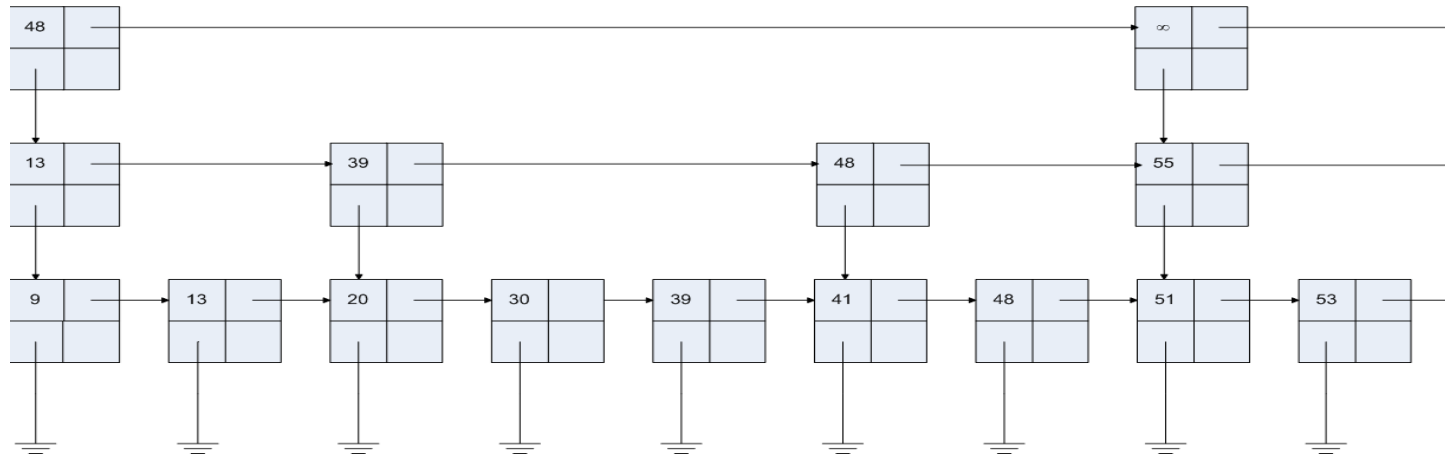
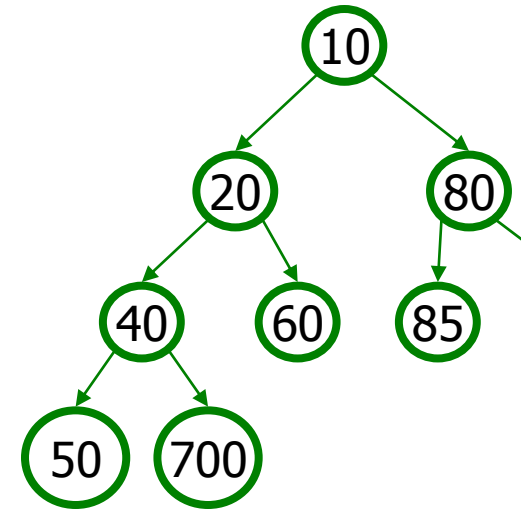
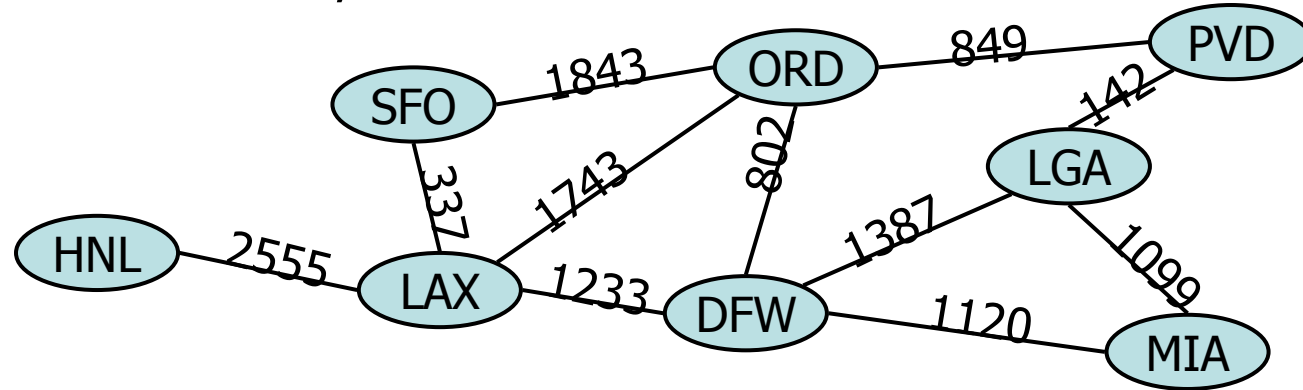
<http://www.cs.washington.edu/143/>

# What's next?

- CSE non-majors
  - CSE 373: Data Structures and Algorithms
  - CSE 374: Programming Concepts and Tools (C/C++, Linux, ...)
  - CSE 154: Web Programming
  - CSE 131: Digital Photography
  - CSE 460: Animation Capstone (open to all majors)
  - INFO, AMATH, DXARTS, ...
- CSE majors
  - CSE 332: Data Abstractions (Data Structures and Algorithms)
  - CSE 311: (Mathematical) Foundations of Computing
  - CSE 331: Software Design and Implementation
  - CSE 341: Programming Languages
  - CSE 344: Intro to Data Management (and databases)
  - CSE 351: Hardware/Software Interface

# Data structures

- graphs, heaps, skip lists
- balanced trees (AVL, splay, red-black)
- CSE 373, 332



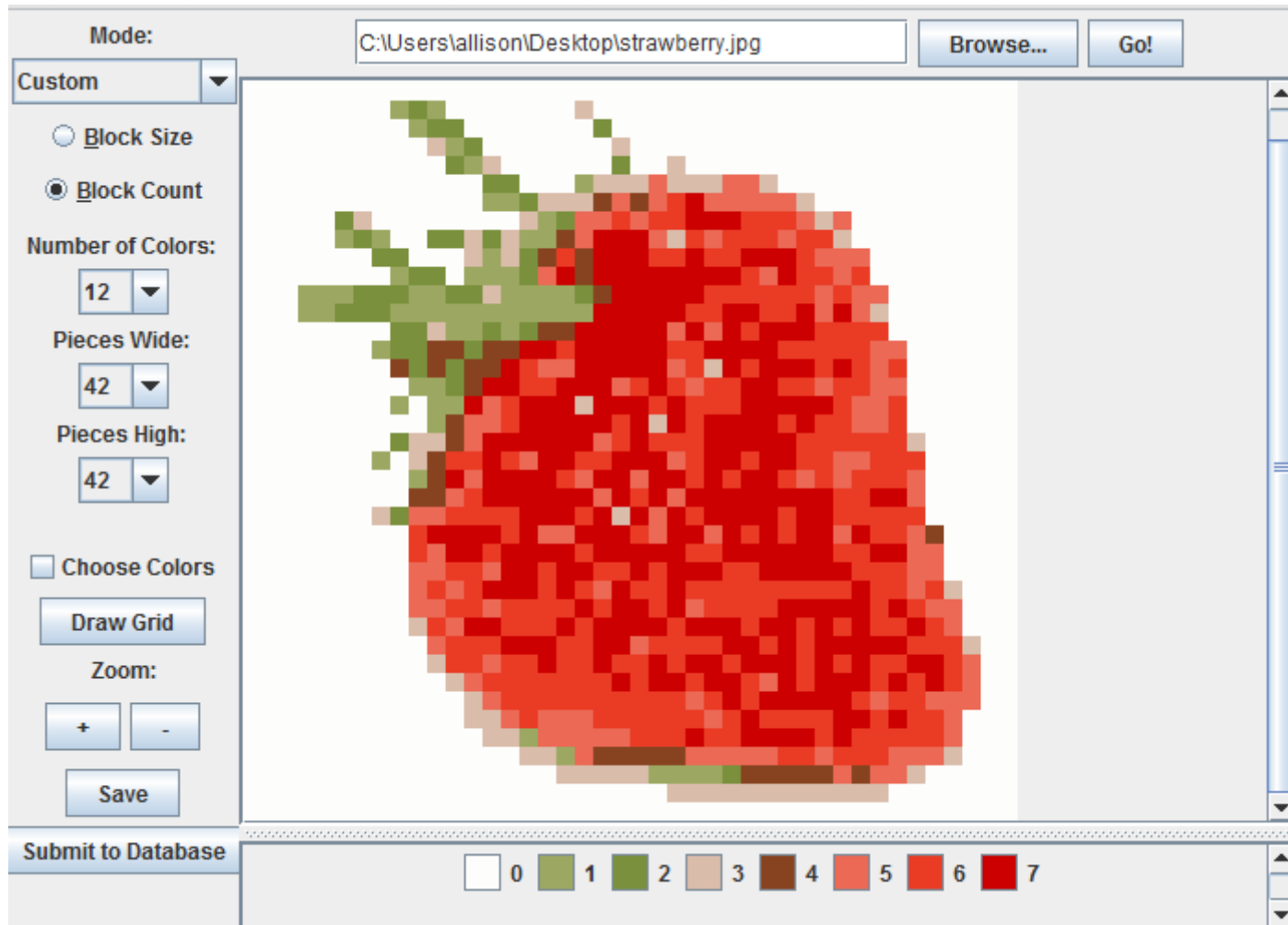
# Give these a try!

- Accessing Facebook data
  - <http://restfb.com/>
- Processing language
  - <http://nlp.stanford.edu/software/>
- Building games with physics
  - <http://jbox2d.org/>
- Processing biological data
  - [http://biojava.org/wiki/Main\\_Page](http://biojava.org/wiki/Main_Page)

# Using the restFB API

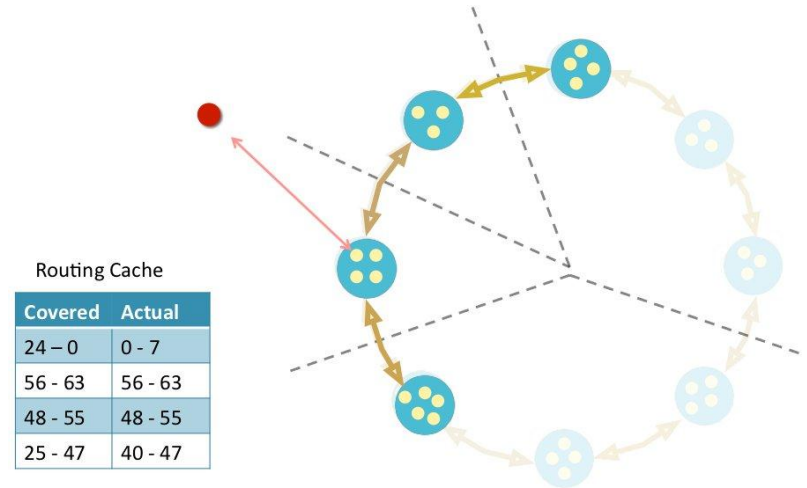
- Add the [restfb.jar](#) to your build path
  - In Eclipse, right click on your project > properties
  - In Java Build Path, Add JARs...
- Create Facebook app (<https://developers.facebook.com/apps>)
- In your browser, request the pages described [here](#) to obtain an access token

# What can you do with 143?



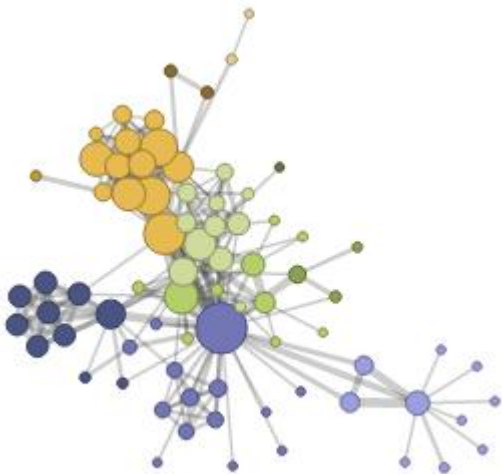
# Undergrad Research

- How do messages get where we want them to go on the internet?
- How can we speed up networks?



# Current Research

- How can we make people stop flaming each other?
- How can we get rid of trolls?
- How can we make sure the data we show doesn't create user bias?



living voter guide

CITY OF SEATTLE Sea 1

SEATTLE 1SD STBD 1

WA STATE 1125

WA STATE 1163

WA STATE 1183

WA STATE 502

WA STATE 8205

WA STATE 8206

Create an account or Login

STATE OF WASHINGTON INITIATIVE 1183

Concerning Liquor: Beer, Wine, And Spirits (Hard Liquor).

This measure would close state liquor stores and sell their assets; license private parties to sell and distribute spirits; set license fees based on sales; regulate licensees; and change regulation of wine distribution.

Long Description [show](#)

Fiscal Impact statement [show](#)

1. What's your current opinion of Initiative 1183?

Support  Oppose

2. What are the most important factors in your decision?

1 - 4 of 28 pros

by Larry Saunders

➤ This Law will not increase the availability of alcohol to minors. They will still get it in their home first and much easier than a store.

[delete](#) / [discuss](#)

by LUG Admin

➤ 1183 gets the state out of the liquor business, allowing consumers to purchase liquor at licensed retailers as they do in most other states.

[delete](#) / [discuss](#) (3)

Pros

by John L.

➤ Is teen alcoholism a problem right now? Has it been since the state had control? Yes - to both questions. So State stores aren't the answer.

[delete](#) / [discuss](#) / [remove](#)

Cons

by Scott James

➤ It's a monopoly Initiative. Out of the hands of citizens. Into the hands of corporate businesses who care more about profits than people.

[delete](#) / [discuss](#) / [remove](#)

1 - 4 of 29 cons

by Brandon W.

➤ Costco would not have invested millions of dollars into 1183 if it were not going to benefit them. This Initiative will eliminate jobs.

[delete](#) / [discuss](#) (1)

by Lori Peters

➤ Can we really afford to take \$25M out of the state budget this year?

[delete](#) / [discuss](#) (2)

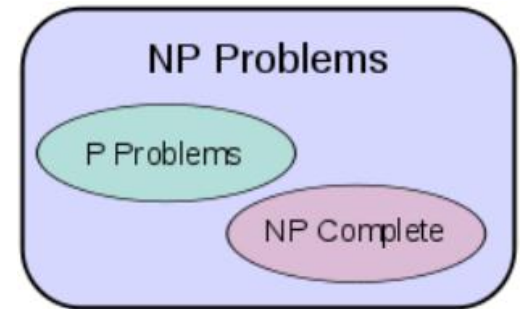
by Sean McCann

➤ 1183 is written by and for

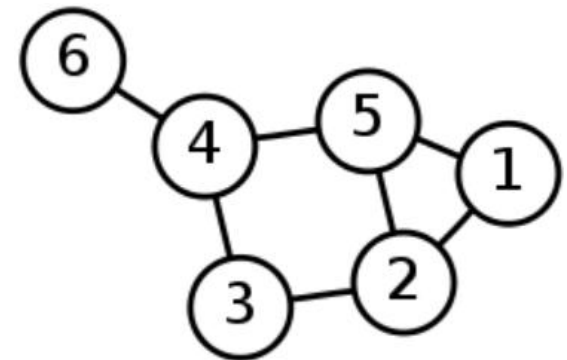
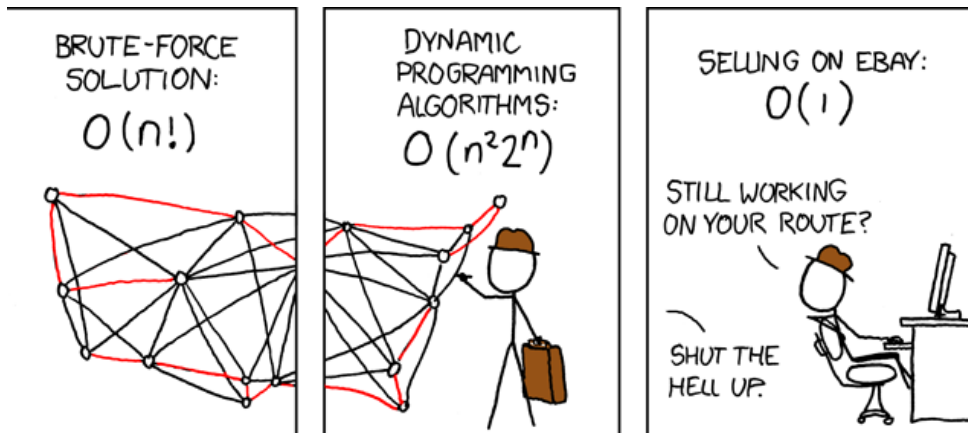


# Theory of computation

- languages, grammars, and automata
- computational complexity and intractability
  - Big-Oh
  - polynomial vs. exponential time
  - $P = NP$ ?
- graph theory

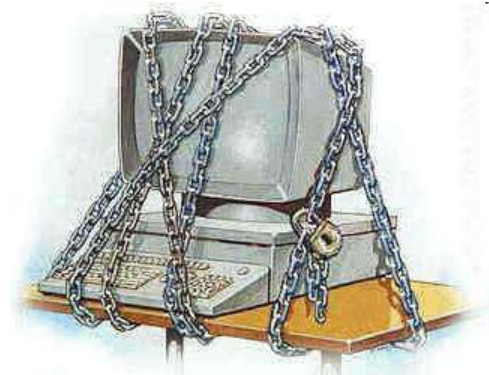


?



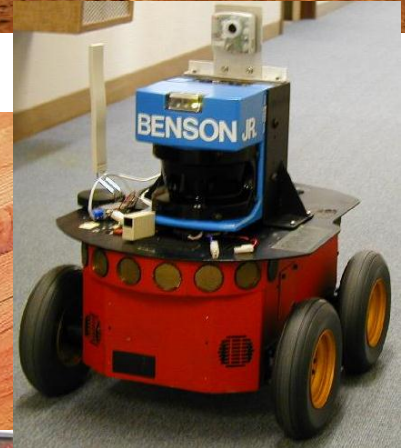
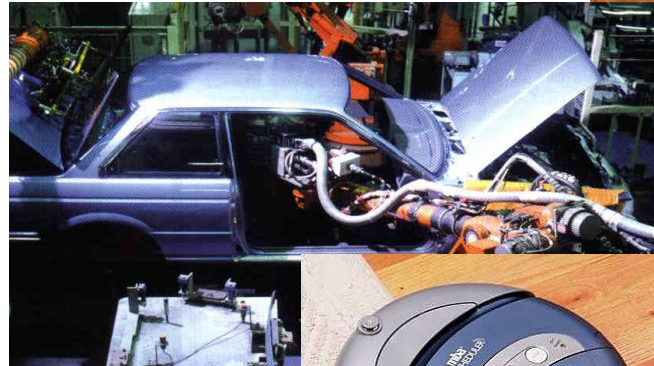
# Security

- **cryptography**: study of hiding information
  - enigma machine
  - RSA encryption
  - steganography
- security problems and attacks
  - social engineering
  - viruses, worms, trojans
  - rootkits, key loggers
- CSE 484 security course
  - hacking assignment: hack into grades, change from 0 to 100%



# Robots

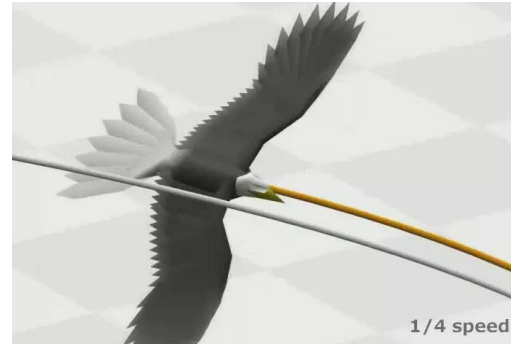
- toys, building cars, vacuums, surgery, search and rescue, elder care, exploration



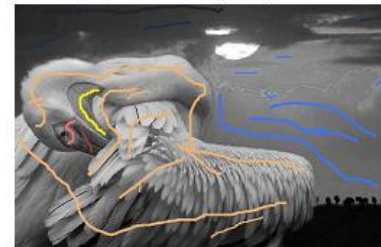


# Graphics and vision

- GRAIL (Graphics and AI Lab)
- computer vision
- AI and the Turing Test



(c) Psuedo relighting filter



High dynamic range

Enhanced exposure

Object removal

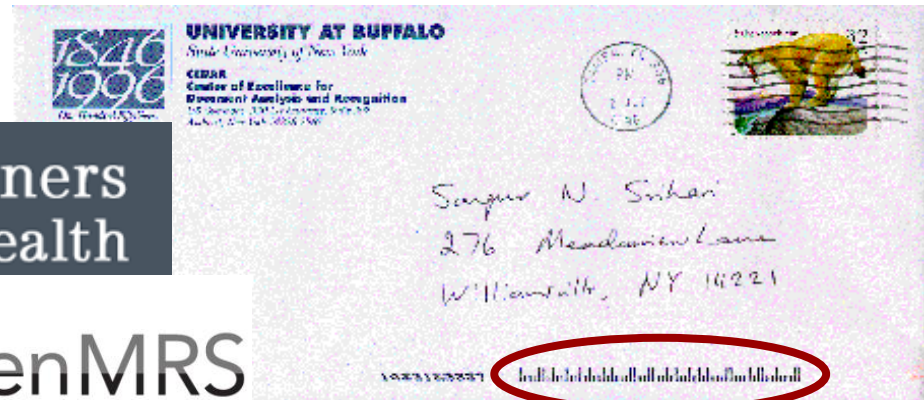
TURING TEST EXTRA CREDIT:  
CONVINCE THE EXAMINER  
THAT HE'S A COMPUTER.

YOU KNOW, YOU MAKE  
SOME REALLY GOOD POINTS.  
I'M ... NOT EVEN SURE  
WHO I AM ANYMORE.



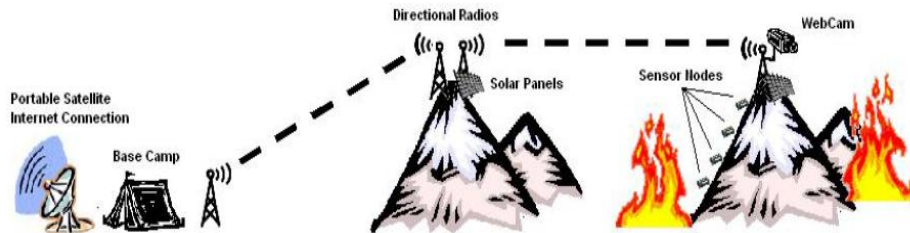
# Data mining

- **data mining:** extracting patterns from large data sets
  - What do these two lists have in common?
    - coughing, rash, high fever, sore throat, headache, heartburn
    - V14GR4, cheap meds, home loans, Nigeria, lower interest rate
  - And what does it have to do with sorting your mail?  
(90% of mail is sorted automatically)
    - [http://www.usps.com/strategicplanning/cs05/chp2\\_009.html](http://www.usps.com/strategicplanning/cs05/chp2_009.html) (2005)

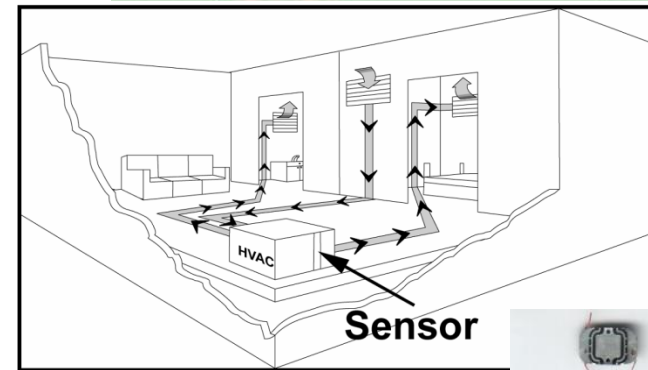
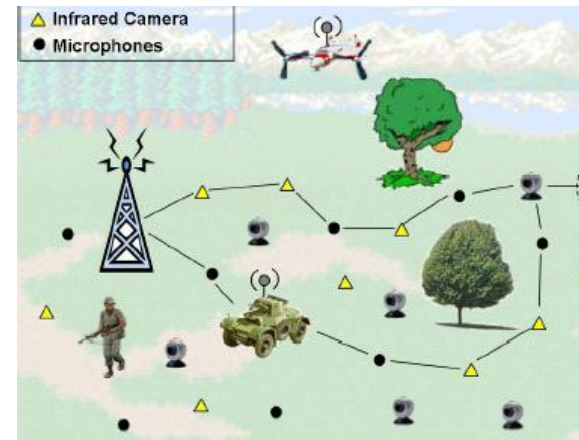


# Sensor networks

- Environment monitoring
- Military Intelligence



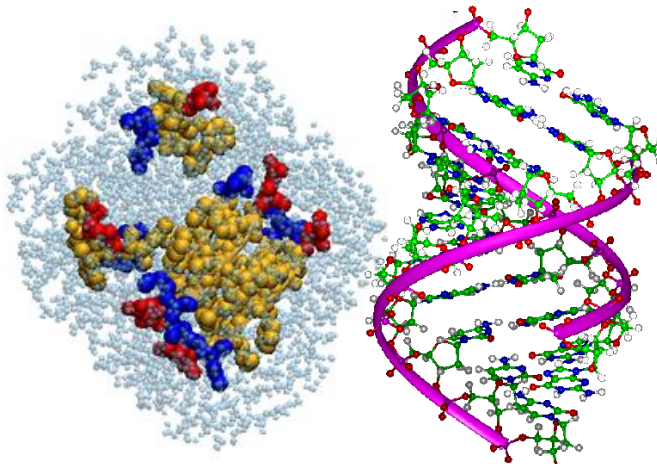
- Intelligent homes
  - detecting human activity through device usage / voltage (S. Patel, UW)
- radio freq. identification (RFID)
  - shopping, inventory
  - credit cards, toll roads, badges





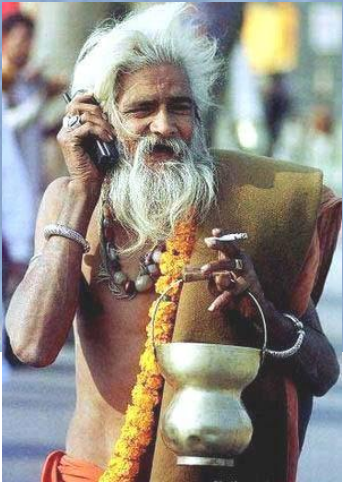
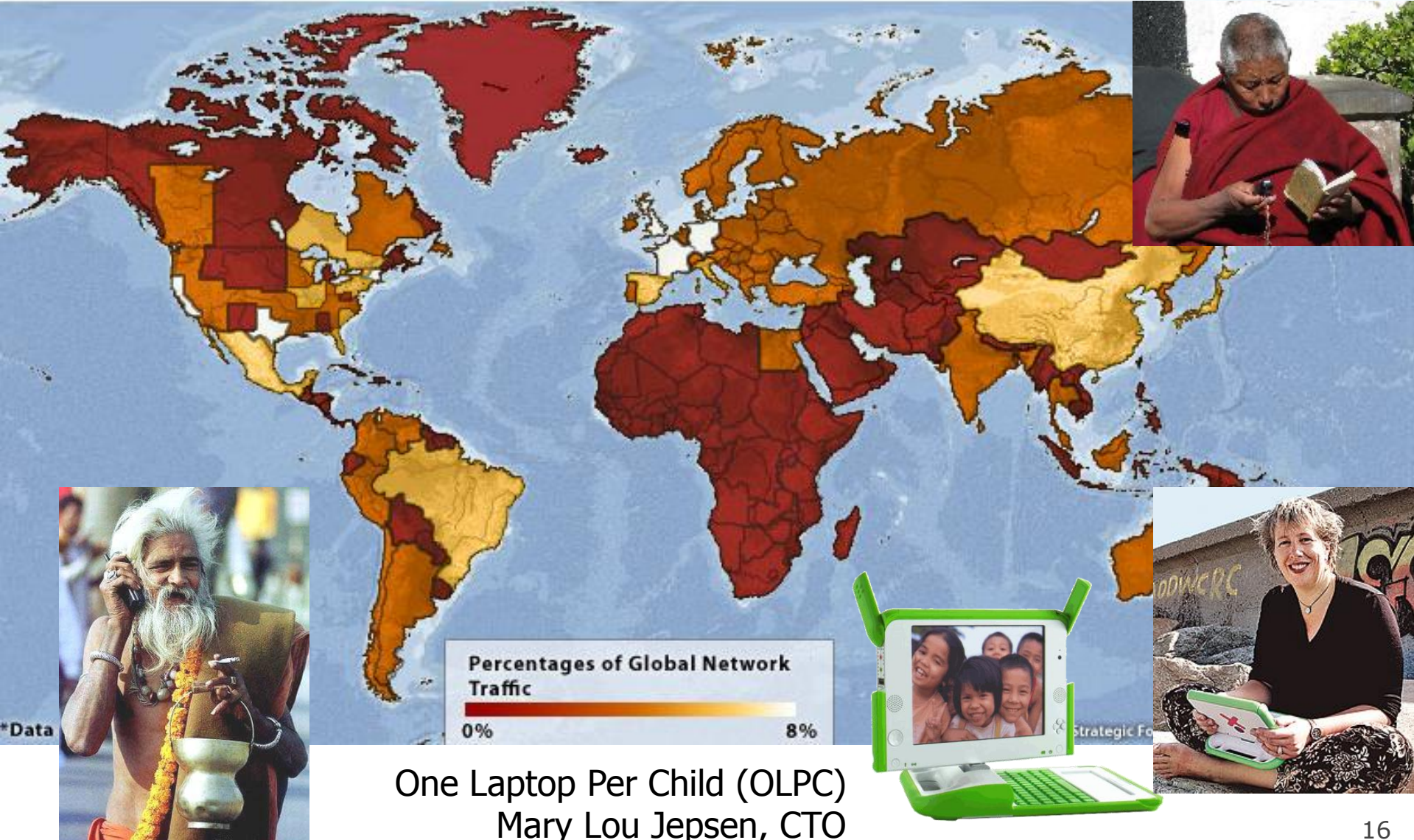
# Science and medicine

- computer science
  - **bioinformatics**: applying algorithms/stats to biological datasets
  - **computational genomics**: study genomes of cells/organisms
  - **neurobotics**: robotic brain-operated devices to assist human motor control
    - <http://neurobotics.cs.washington.edu/videos.html>
  - assistive technologies



# The developing world

GLOBAL INTERNET TRAFFIC AS OF FEB. 21, 2008, AT 15:09 GMT



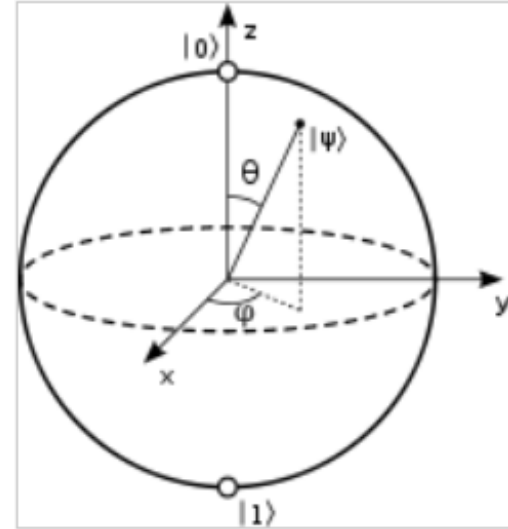
One Laptop Per Child (OLPC)  
Mary Lou Jepsen, CTO





# Quantum computing

- **qubit**: A particle that can store 0, 1, or any "superposition" between
  - a bit that can sort of be 0 and 1 at once
  - **quantum computer**: uses qubits, not bits
  - theoretically makes it possible to perform certain computations very quickly
    - Example: factoring integers (why is that useful?)
  - actual implementation still in its infancy
    - can add single-digit numbers; can factor 15



# Experience optional

- Mark Zuckerberg, Facebook
  - side project while soph. CS major at Harvard
    - in 2 weeks, 2/3 of Harvard students joined
- Bill Gates started "Micro-Soft" at age 20
- Larry Page / Sergei Brin, Google
  - made "BackRub" search at age 23
- [Roberta Williams](#), Sierra
  - pioneer of adventure gaming
- Ryan Hankins, vsfinder.com

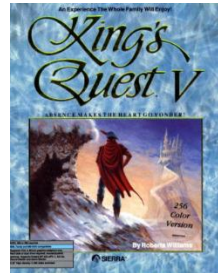
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Microsoft



Google



# Join us!



<http://www.cs.washington.edu/WhyCSE>