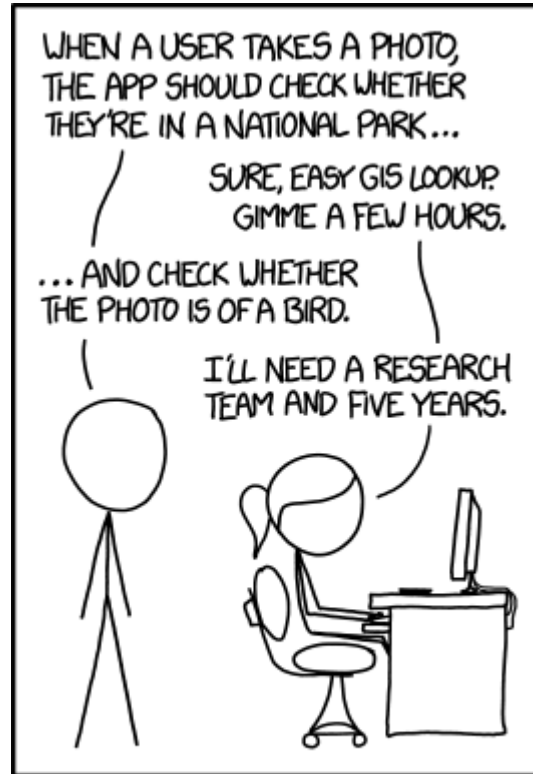


# CSE 143



IN CS, IT CAN BE HARD TO EXPLAIN  
THE DIFFERENCE BETWEEN THE EASY  
AND THE VIRTUALLY IMPOSSIBLE.

Goodbye, world!

# Major themes

- Abstraction
  - Leverage existing components without understanding details
  - Create components that can be used as black boxes
- Algorithm analysis
  - Scalability and growth
  - Tradeoffs between implementations
- Recursion
  - Reason about problems in terms of self-similarity
  - Write very short code to achieve complex behaviors
- Beauty

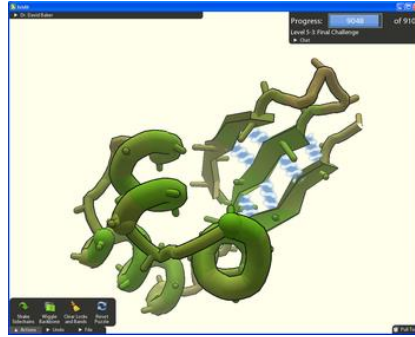
# Beyond programming

- Mind-controlled robots
  - <http://www.youtube.com/watch?v=TQ7EOpPNQyw>
- Muscle-controlled interfaces
  - <http://www.youtube.com/watch?v=pktVSTwC8qo>
- 3D models from pictures
  - <http://www.youtube.com/watch?v=25Yifq70eIY>
- Face aging
  - <http://www.youtube.com/watch?v=fLQtssJDMMc>
- Animation
  - <http://www.youtube.com/watch?v=b4kkPIldMvl>
- Security
  - <http://www.pbs.org/wgbh/nova/tech/tadayoshi-kohno.html>



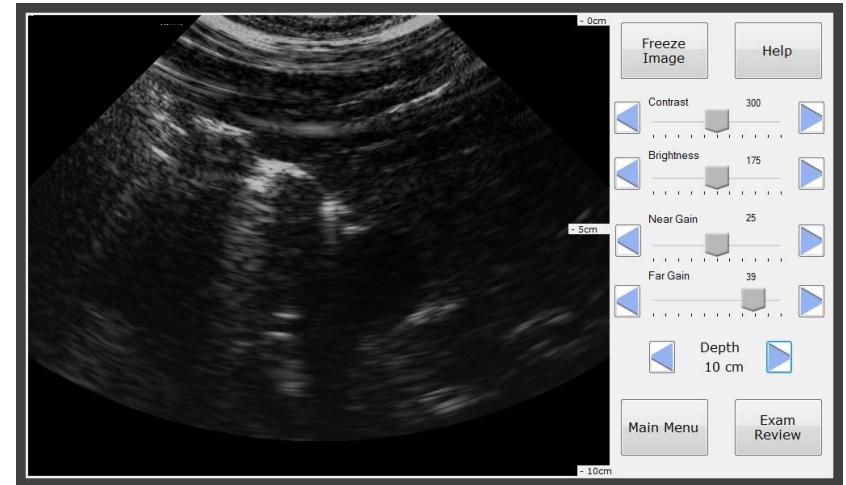
# Computing for good

- [Foldit](#)



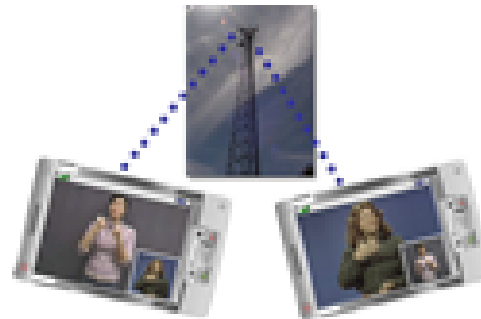
- [Open Data Kit](#)

- [Mobile Midwives' Ultrasound](#)



- [MobileASL](#)

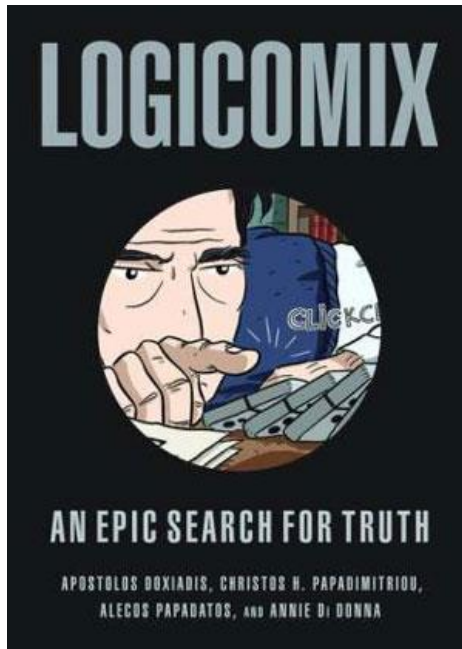
- [Tactile Graphics](#)



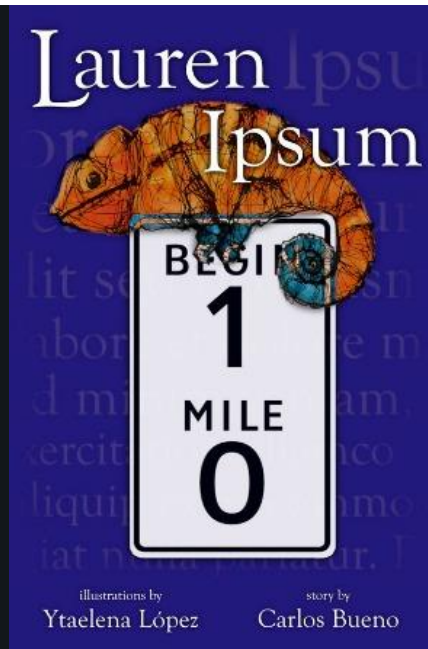
# Courses?

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

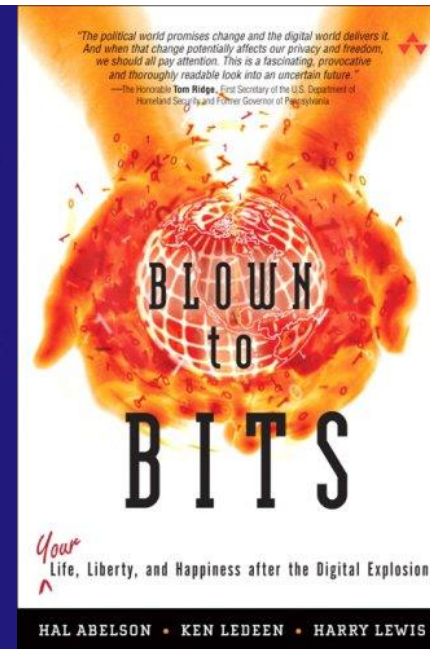
# Explore Big Ideas



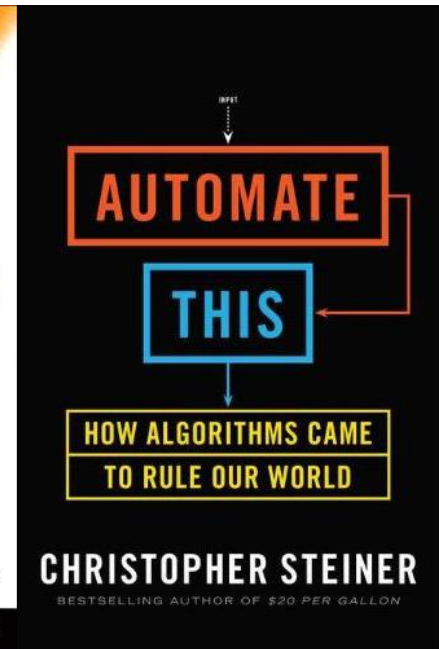
Historical context



Key algorithms



Privacy



Automate all the things

# Do a project!

- Little text-processing applications
  - identify lines above 100
  - remove line-breaks
- Add a GUI to the random sentence generator
- Automate chemistry, physics, calculus problems, etc
- Find quotes by keyword in books
- What are you currently doing that a computer could do?

# Other languages?

- Expanding your Java knowledge with a project is valuable
- Pick a project, see what language is most appropriate
  - iOS: [Objective-C](#) or Swift
  - Android: Java
  - Client-side web: Javascript
  - Beautiful visuals: [Processing](#)
  - Quick data processing: [Python](#)
  - Embedded systems: C/C++
- Learn a new paradigm
  - Functional languages: [Racket](#), [Haskell](#)



# Leveraging existing code

- 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)

# Weekly meetings

- Change – technologies for low-income regions
  - <http://change.washington.edu/>
- Dub – human-computer interaction and design
  - <http://dub.washington.edu/>