

CMSC201

Computer Science I for Majors

Lecture 0X - Careers

Today's Objectives

- To introduce careers in Computer Science
- To explore using Computer Science with other fields (interdisciplinary)
- Talk a little bit about grad school

Careers in STEM Fields

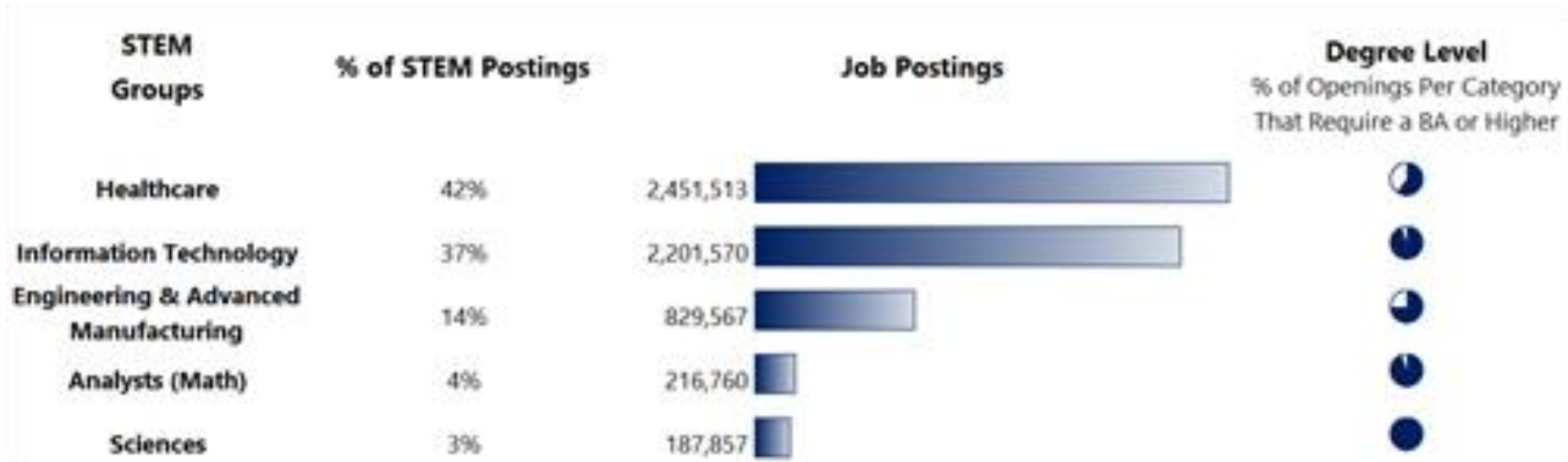
What is STEM?

- STEM is an acronym referring to the academic disciplines of:
 - Science,
 - Technology,
 - Engineering, and
 - Mathematics

STEM Job Market (2013)

- 5.7 million total postings in STEM fields
- 4.4 million (76%) require at least a bachelor's degree
- 2.3 million (41%) are entry-level jobs
 - Requiring less than 2 years of experience

STEM Jobs by Career Area

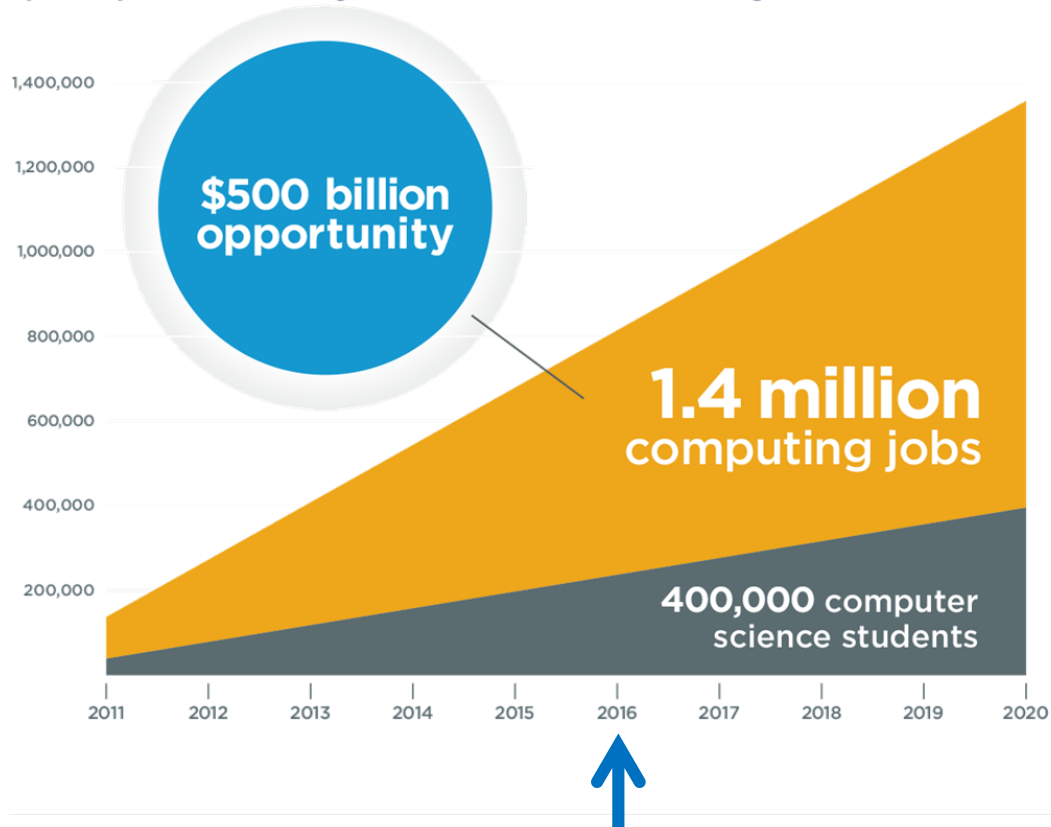


Demand for STEM Graduates

- 48% of all entry-level jobs requiring a bachelor's degree or higher are in STEM fields
 - Only 29% of bachelor's degrees are in a STEM field
- There are 2.5 entry-level job postings for each new 4-year graduate in STEM fields
 - Compared to 1.1 postings for each new graduate in non-STEM fields

Demand is Only Growing

1,000,000 more jobs than students by 2020



Computer science is a top paying college degree and computer programming jobs are growing at 2X the national average.

Interdisciplinary Computer Science

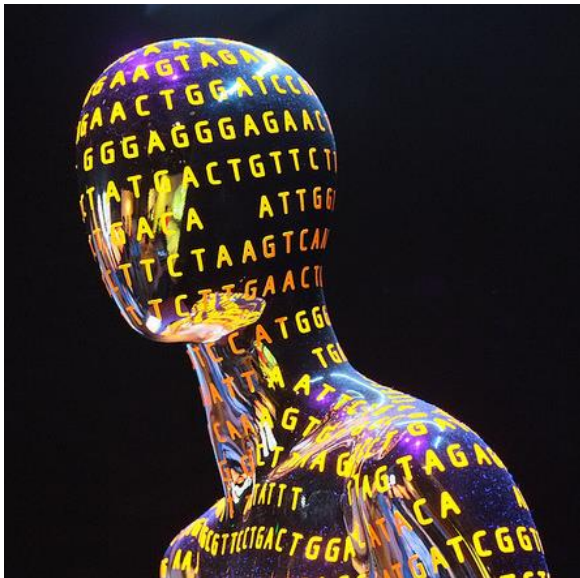
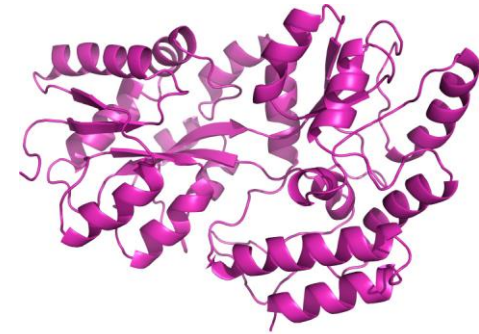
Learning to Program is for Everyone

- In the [Lost Interview with Steve Jobs](#), he said:

“I think everybody in this country should learn how to program a computer because it teaches you how to think.”

Computer Science and Biology

- Human Genome Project
- Tagging and tracking animals
- Protein folding



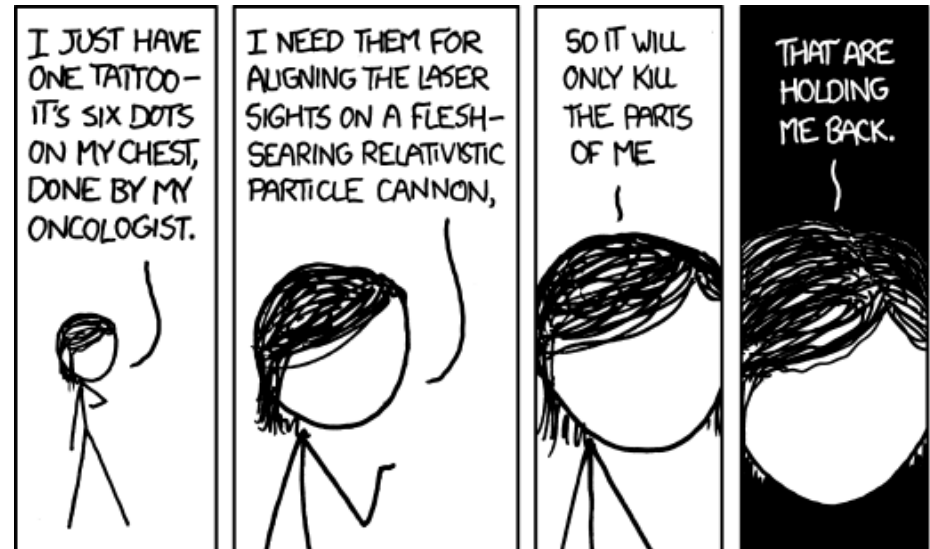
Computer Science and Film

- Animated films
- Motion capture
- CG special effects



Computer Science and Healthcare

- Pharmaceutical manufacturing
- Predictive diagnostics
- Chemotherapy machines



Computer Science and Space

- Analyzing data from spacecraft
- Planning the Mars mission
- Programming landers, shuttles, etc.



Margaret Hamilton &
her Apollo 11 code

Computer Science and MechE

- Google's self-driving car
- Automated factories
- Robots!



(More Robots)

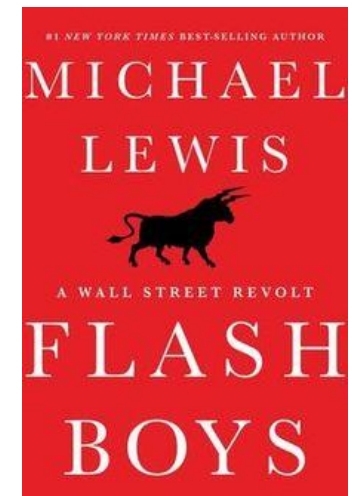
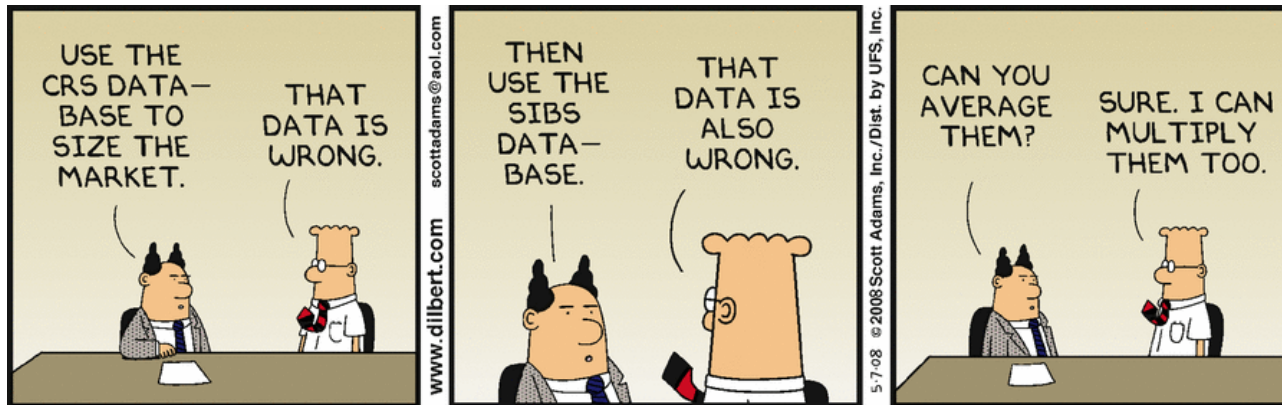
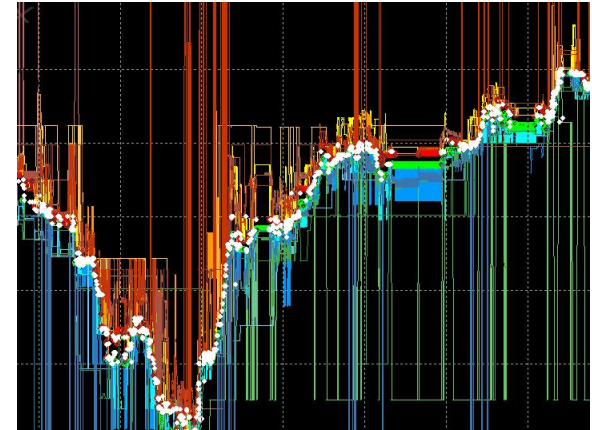


- Robot bloopers:

<https://www.youtube.com/watch?v=g0TaYhjpOfo>

Computer Science and Finance

- High-frequency trading
- Computational finance
- Risk analysis



Grad School

Why (or Why Not) Grad School?

- Reflect – think about your education so far
 - What are your passions?
 - What are your goals in life?
 - What excites you?
 - What lifestyles might you want?
- Avoid listening to what others tell you to do; think about what you want

Why (or Why Not) Grad School?

- An **MS** is basically a technical degree that gives you more interesting job opportunities
- A **PhD** is basically a research degree, which opens up a host of advanced and research-oriented opportunities
- In industry, MS and PhDs are often a ticket to eventual upper-level management

How Long is Grad School?

- MS
 - 1 to 2 years is typical

- PhD
 - 4 to 6 years is typical
 - It can take longer! (8 years or more)
 - Many schools have a limit to how long you can take

What Is It Good For?

- MS is essentially a technical degree
 - Open up a range of much more interesting jobs
 - More responsibility, creativity, flexibility, and income
- PhD is basically a research degree
 - Research today is collaborative (interdisciplinary!)
 - No “lonely hacker toiling away alone in the night”
 - Many become professors and also teach classes

What Most Schools Don't Teach



Announcements

- Labs will meet in person starting next week
- Lab 1 is due by Thursday night
- Homework 0 is out now
 - Not “worth” points, but important material
- Next Class: Variables