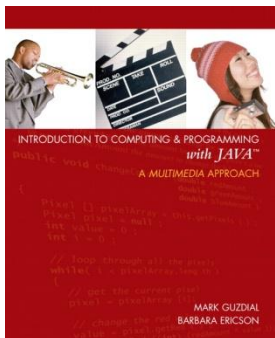


# COMPUTER SCIENCE 1026A

## COMPUTER SCIENCE FUNDAMENTALS



Notes adapted from Introduction to Computing and Programming with Java: A Multimedia Approach by M. Guzdial and B. Ericson, And instructor materials prepared by B. Ericson.

# Instructor

- Stephen Watt
- [watt@csd.uwo.ca](mailto:watt@csd.uwo.ca)
- Office: MC375



# Why take this course?



- Learn how to solve real world problems using computers
- Amazing job prospects
- Because it can change the world – this business is binary, you're a 1 or a 0

# Real World Problems

- Research in computer science is used to study and help solve real world problems such as:
  - Cancer (Jenna Cameron)
  - Storing the Genome (Beth Locke)
  - Keep distributed systems low energy to combat global warming (Hanan Lutfiyya)
- Also used to work on fun problems:
  - Video game development (Mike Katchabaw)
  - Computer Vision (good for robotics and army) (Yuri Boykov)
  - DNA Computing (Lila Kari)

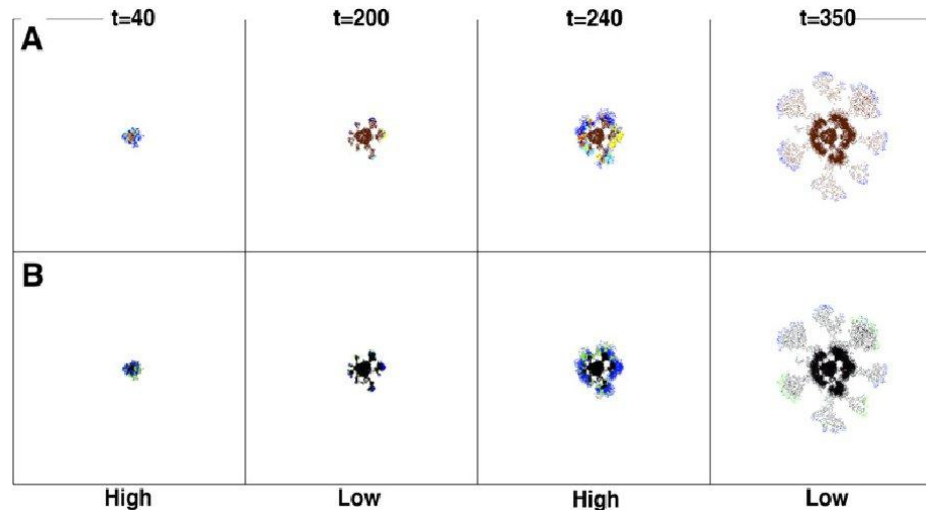
**The people in brackets are actual people at UWO working on these projects. A degree in Computer Science would prepare you to work on any of these kind of amazing projects!**

# Cancer

- Curing cancer one click at a time
- Computer scientist A.R.A Anderson has worked for over 10 years studying cancer using computers
  - ▣ He modeled the way cancer spreads in the body
  - ▣ Jenna's thesis project is on expanding his work to more accurately represent what happens in the body

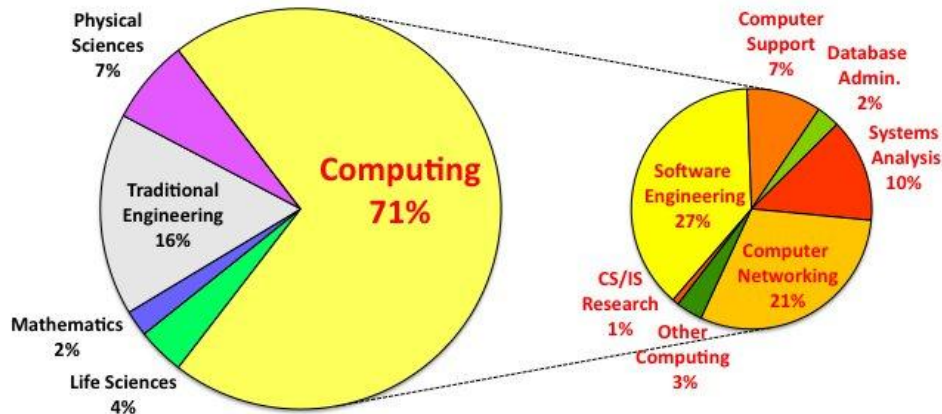
# Cancer

- Models predict when and where a tumour will spread
- Can predict prognoses, and more importantly, what treatment would work best



# Job Prospects

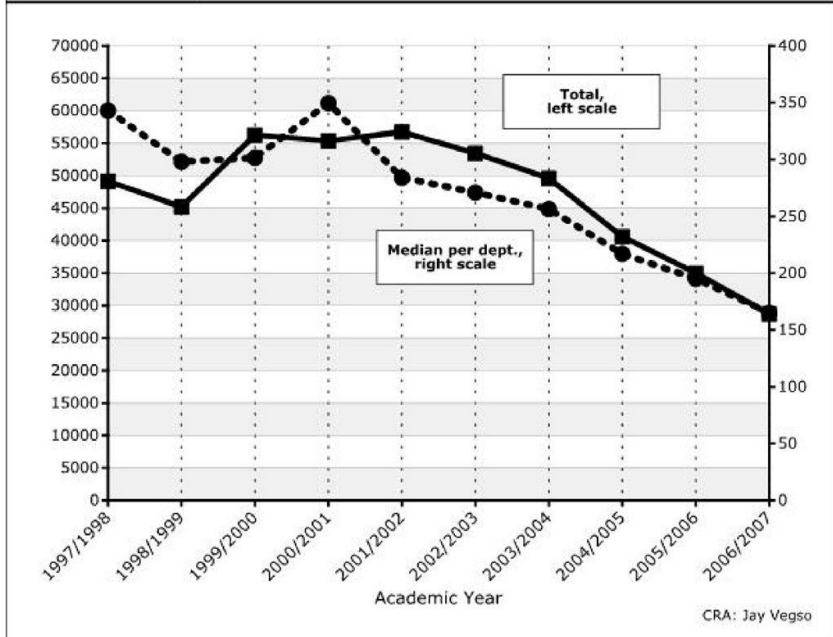
Percentage Of New STEM Jobs By Area Through 2018



Data Source: US-BLS Employment Projections, 2008-2018 ([http://www.bls.gov/emp/ep\\_table\\_102.pdf](http://www.bls.gov/emp/ep_table_102.pdf)).

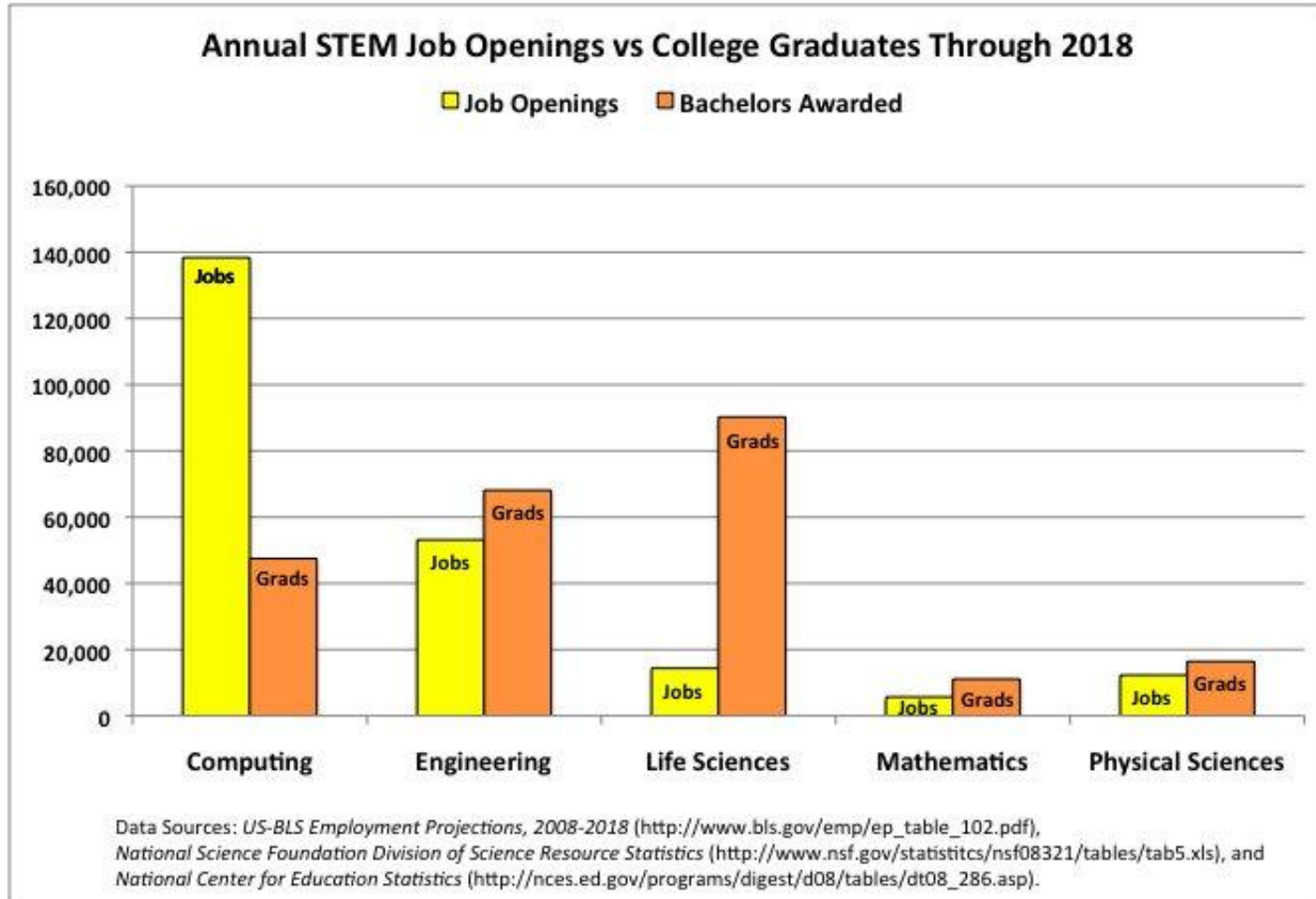
Figure 2. Undergraduate CS Degree Enrollments

Source: CRA Taulbee Survey



CRA: Jay Vegso

# Job Prospects





# Change the World

- Think of what the world must have been like before 2 college students created Google
- Can you imagine a world without cell phones, iPods or cars?
- Almost everything we interact with now has a computer in it – and a computer scientist dreamed it up!

# Back to cancer...



- If you were going to try to cure cancer, what types of things would you think about?

# Back to cancer...

- Body, organ, cell → Objects
- Grow, eat, divide → Methods
- How big? How many cells? How old are the cells? How old is the body? What organ? → Attributes
- We learn how to turn a simple list like this of things, actions and attributes into a full computer program by the **end of this course!**

# Course description

CS1026 is an introduction to the basic concepts of computer programming and program design using

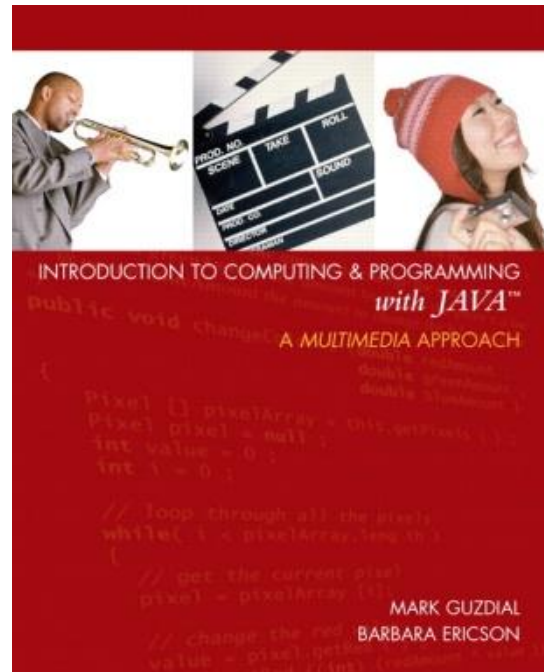
- ❑ a **multimedia approach**
  - ❑ images
  - ❑ sound
- ❑ problem solving
- ❑ the programming language **Java**

# Who is this course for?

- No prerequisites
  - But previous programming experience helps
- It is an introduction to programming
  - For students who intend to go on into Computer Science
  - For students who want to gain some expertise in Java programming
- It is not an easy course
- Not for students with significant background in computer programming

# Textbook

## Introduction to Computing and Programming with Java: A Multimedia Approach, by Guzdial and Ericson



# The course website

- <http://www.csd.uwo.ca/courses/CS1026b>
- Contains course related information:
  - lecture notes
  - lab instructions
  - assignments
  - links to other sites
  - sample code

Check it frequently for announcements

# Lecture notes

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- Available from the CS1026b website
- They are copies of the slides used in class, and are intended to help in note-taking during lectures
- They are **NOT** a substitute for attending lectures



# Labs

- **2 lab hours per week**, in computer lab in Middlesex College
- Labs start week of Jan 17.
- Purpose of labs: guided, hands-on experience with Java programming
- **Labs are mandatory and graded**
- Lab instructions will be posted on the course website
  - Read through the lab instructions before coming to the lab.
  - Do the pre-lab preparation.
  - First lab: bring a printed copy of the lab instructions to the lab.

# Computing environment

- The computers in our **First Year Teaching Environment (FYTE)** run under **Windows**
- To use our computer labs, you need
  - **Username:** your uwo email username
  - **Password:** emailed to your uwo email address
  - You will need your password for the first lab, so make sure you read your uwo email before your first lab session

# Summary

- A degree in computer science can take you just about anywhere – from the world of video games to curing disease
- This course will prepare you to start an undergrad degree in computer science
- By the end of this course you will be able to read and write computer code, and think like a computer scientist

Get ready for a great course!