CAREER CONNNECTIONS
WHY SOFTWARE ENGINEERING? AND HOW?

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AGENDA

- Software Engineering (SWE) Culture
- Relationship between Courses and Career
- Doing well at Software Engineering Interviews

CAPITAL INVESTORS IN SWE

- Are excited by the length of time it takes to develop something from scratch (usually less than a year), compared to other fields.
- Are excited by the little cost required to accomplish a software engineering startup (assuming you got your laptop, it is almost $0 to develop your product, start to finish)

SWE FIRMS

- Highest cost is salary of employees.
- Nature of work is highly logical and design oriented. Employee turnover generates a big loss on the firms.
- Average SWE turnover in silicon valley: 18 months!

THEREFORE, GOOD SWE FIRMS

- Once you join and start contributing: They will try their best to keep you.
- Offer *insane* perks (Healthcare, education reimbursement, social offsites, free food).

CAREER & COURSES: YOUR DISCRETION IS ADVISED

- I will only relate courses to career options, though you may take a course just out of interest / curiosity or to meet University requirements.
- I will try my best to distinguish specialized fields from generic ones.

COURSES & CAREER: AREA 5

- Comp Networks 1, 2, and Internetworking
  - Networks 1 has some generic concepts: Internet protocols, CRC, …
  - Otherwise, qualifies you to work in network-specialized companies: Cisco, Qualcomm, ...

COURSES & CAREER: AREA 5

- ECE342 - Computer Hardware *MUST TAKE*. Teaches generic fundamentals in circuit design and algorithms (also, Stephen Brown is one of the best lecturers in the Universe)

COURSES & CAREER: AREA 5

- ECE451 - VLSI: Specialized, qualifies you for twofold:
  - Deep physical layouts, on chip design
  - Working to develop CAD tools (like Altera Quartus)

COURSES & CAREER: AREA 6

- Algorithms & Data Structures *MUST TAKE.* Very generic, applies to the entire space of Computer Science
- Seems hard at beginning, the more you practice, the easier it becomes.
- The course that will help you most answering interview questions.

COURSES & CAREER: AREA 6

- Operating Systems *MUST TAKE.*
  - Great knowledge on how computers work.
  - Generic example of good system design.

NEEDLESS TO SAY

- Without Operating Systems knowledge or Algorithms and Data Structures, I don’t personally consider one as a Software Engineer.

COURSES & CAREER: AREA 6

- Programming Languages: generic, makes you ramp-up fast when you join a work place, no matter what language they use. Though not a requirement at all to secure a job.

COURSES & CAREER: AREA 6

- Computer Graphics (Game companies)
- Databases (Generic, *easiest course that enables you to write end-to-end useful applications)*
- Computer Security (Essential for online companies with significant presence: Google, eBay, …).

COURSES & CAREER: AREA 6

- Bio Computation (Specialized, field under research, though may be interesting)
- Computer Systems Programming (*Generic*, teaches cool tricks to write fast code)

COURSES & CAREER: COMPUTER SCIENCE

- CSC320: Computer Vision (interesting Math concepts that apply to fields like Machine Learning and Data Mining)
- Machine Learning

YOUR RESUME NOTICED.

DO ONE OF:

1. Do a project outside your curriculum (3 or 4 hours a week)

- Must be something that pushes the boundaries of your skillset.
- Preferably with new / hot technologies
- Ex: an iPhone application, a web-application on django or Ruby on Rails, or an application that communicates with Cassandra or Redis.

YOUR RESUME NOTICED.
DO ONE OF:

2. Join ACM practices at the University of Toronto, and put on resume

YOUR RESUME NOTICED.
DO ONE OF:

3. Educate yourself about (or even better, contribute to), hot open source projects: Cassandra, Hadoop MapReduce, Javascript Libraries, CSS, Ruby, Python, …

PREPARING TO DO WELL IN INTERVIEWS

1. Exercise the day before!
    - Running puts you in a euphoric state that gives you confidence, makes you more cheerful, and improves your personality

PREPARING TO DO WELL IN INTERVIEWS

2. Google for “Google Interview Questions”
   - Wealth of questions on forums
   - Answer most in ‘your head’ (for time)
   - Yet, actually type out (and compile+test) a few
   - DISCUSS SOLUTIONS WITH A FRIEND

PREPARING TO DO WELL IN INTERVIEWS

3. Appear to be curios

- When you finish solving a question that required you to put thoughts, ask: “Is this what you were expecting?”, or “Would you have done this similarly or do you have another solution in mind?”
- If Interviewer did not, ask him/her about her Job title, and more importantly, ask: “What would be an interesting project that you on recently?”

QUESTIONS?