Tips on job interviews for software engineers and data scientists
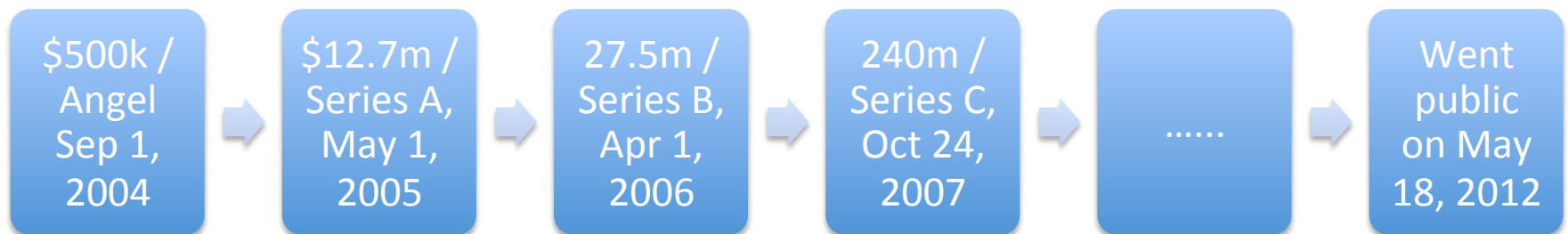
Yu Xin

Why IT?

- Most job opportunities are in IT
- The compensation in IT is growing, for fresh PhDs:
  - 100k~150k in 2009
  - 190k~240k in 2014
- It opens up possibilities to start your own companies either in US or China down the road

A typical package

- Base 140k
- Bonus 10%
- Stock option 220k (vested in 4 years)
  - 1 year cliff, then invested monthly after that
- Sign on bonus 50k
- Relocation 10k
- First year = 269k
- Total package : Base + Bonus + (Stock option + Sign on + Relocation)/4 = 224k

Spectrum of companies

- Q1: How to select the right company?
- Facebook's funding journey:

| $500k / Angel Sep 1, 2004 | → | $12.7m / Series A, May 1, 2005 | → | 27.5m / Series B, Apr 1, 2006 | → | 240m / Series C, Oct 24, 2007 | → | …… | → | Went public on May 18, 2012 |

- After each round of funding, the valuation of stock options can rise multiple times

Established companies

- Company reputation
- Good training programs
- H1B and green card sponsorship
- Great benefit programs
- Stock options can be quickly turned into cash
- 190k ~ 240k

Early stage companies

- Quickly move to high level management positions
- The experience is valuable for starting your own companies in future
- Potential to earn stock options that worth several million dollars

Will early stage companies be successful in future?

Trust professionals. 2 sources:

- Founded by previously successful entrepreneurs
  - Paypal mafia. Companies they found include:
    - Tesla motors, Linkedin, Palantir, SpaceX, Yelp, Youtube
- Famous venture capital
  - Sequoia capital
    - The companies they invested take 20% of Nasdaq
    - Include: Apple, Cisco, Google, Oracle, Youtube, 新浪，阿里巴巴，京东.

Where to find them?

- MIT career fair

- Techcrunch:

1st step: get an interview

- Internal referral
  - Can get response in less than 3 weeks
  - Employers have high expectations on you
- Career fair
  - Chance to talk to know more about the company
  - Make a good impression to the employer
- Head hunter
  - Help you find companies and set up the interviews, and they are free!
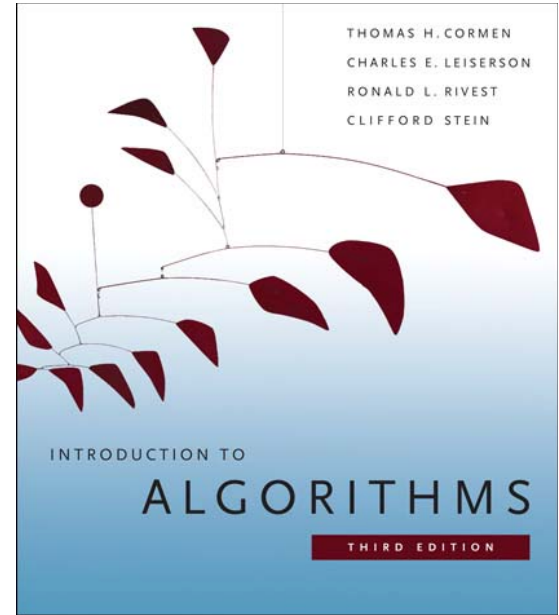
2nd step: prepare the interview

Software engineer requirements:

- Programming (80%)
  - One of the languages: Python (similar to matlab), C++, Java
  - Given a problem, implement an efficient algorithm
- System design (20%)
  - How to handle large number of requests. Lots of users, multiple servers, server communications….
  - May ask you to talk about your previous projects

2nd step: prepare the interview

Programming

- Learning algorithms
  - Read slides for 6.006 or 6.046 (both undergrad classes, simple math)
  - Or read the book on the right

- Practice
  - Leetcode (191 questions), at least once, twice would be safe
  - https://leetcode.com/problemset/algorithms/

2nd step: prepare the interview

System design

- Learn system design basics
  - Read slides for 6.824 or 6.829
  - Check some previous interview questions from glassdoor.com

- Projects
  - Strongly recommend to take 6.867 machine learning
  - Knowing machine learning helps your research and is a big plus in resume

2nd step: prepare the interview

Data scientist requirements:

- Programming

- System design

- Knowledge of statistics and machine learning

- Ability to handle real world data

2nd step: prepare the interview

- Statics and machine learning
  - Take 6.867 or read its slides

- Handle real world data
  - Learn python package, numpy (closet to matlab), scikit-learn (for machine learning)
  - Or R

Data scientist vs software engineer

	Data scientist	Software engineer
Interview	Harder	Easier
Salary	Slightly lower	Slightly higher
Time	Flexible	On call (1 week in 1 month)
Projects	More interesting	Depends on team
PhD	Usually requires	Does not require, but PhDs have higher level

3nd step: take the interview

- 1 or 2 phone interviews
- 1 day onsite interviews
  - Meet 4-7 people, some are technical, some are HR interviews

- Tips:
  - When given the problem, think for 1-2 mins before writing codes
  - Speak while you write codes, give your interviewer a chance to help you
  - Test a few cases before you are done

4th step: negotiate offers

- Employers assume you will negotiate, so they give you a lower offer at first

- You may get as much as 100k simply by asking

- Need a reason to negotiate:
  - Another company gives me a higher offer / has better location / are more established…..

- Learn how to negotiate
  - Tell them you only consider between it and another company
  - You are very interested in the position and ask if they can make the offer comparable

Final tips

- Timing matters
  - Companies could take advantages of you if they know you just started interviews
- Attitude matters
  - Tell them you love them
- For MIT students who are either too busy or too lazy to prepare
  - Try Oracle. Very friendly to MIT students.