HCI ECG Alumni Hangout: Ask Me Anything!

Zeng Fan Pu

Carnegie Mellon University

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Background

- HCI(HS): SMTP (Defence Science), Canoeing
- HCJC: PCME, GATE Physics (14S6G), Infocomm and Robotics Society (Vice Chair)
- JC extracurriculars: competitive programming (NOI, APIO), Capture-The-Flag cybersecurity competitions, hackathons, various software development competitions, business plan competitions, MUN
- CMU:
  - PPP (competitive hacking team), Autolab (open-source assignment autograding platform in use in many colleges)
  - Graduated 2022 with B.S in Computer Science with university honors and 3 minors: Concentration in Algorithms and Complexity, Concentration in Computer Systems, Minor in Mathematics
  - Recently finished M.S in Computer Science

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College Applications

- 1st time during J2: applied to Stanford and Harvard (why??), didn't really know what I was doing, rushed and sloppy application
- 2nd time during 1st year NS: aimed for schools that are strong in CS and also has a great startup culture.
- Restrictive Early Action for Stanford, Regular Decision for MIT, CMU, Cornell, Princeton, Caltech
- Accepted to CMU and Cornell, easy choice to choose CMU

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Scholarships

My experience:

- Knew that I would end up breaking a bond with any government agency
- Filled up application for IMDA's SG Digital Scholarship, the least restrictive option: bond can be served with any tech company in Singapore
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- IMDA sent me an email informing they extended the deadline by 3 days
- No, sorry I'm not applying! ☺

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Scholarships

- Definitely the right choice in hindsight: most peers in STEM ended up breaking bond
- For more on my thoughts on scholarships, see my blog post: `https://fanpu.io/blog/2021/against-government-scholarships/`

CMU School of Computer Science Overview

- Small tight-knit cohort, ~ 200 people
- Rigorous and challenging undergraduate curriculum
- Great professors, introductory classes have an army of teaching assistants (TAs), strong academic support system
- Easy to do undergraduate research
- Common to have imposter syndrome
- Everyone gets good jobs after graduation or goes to a top graduate program

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Many Areas To Explore Your Academic Interests

7 departments within the School of Computer Science (largest in the world)
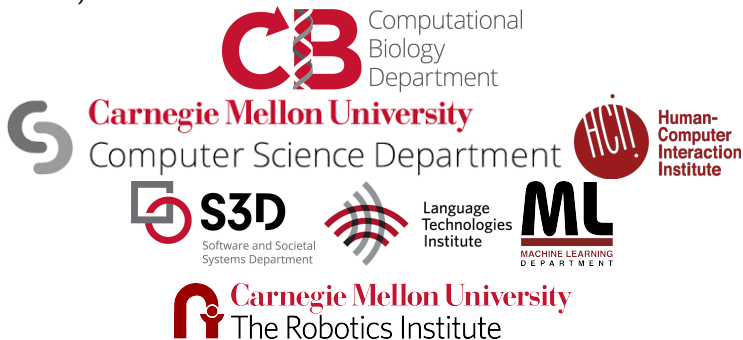
Creating a More Just and Equitable Future

Percentage of Male and Female First-Year Students by Year of Enrollment in Computer Science at Carnegie Mellon University
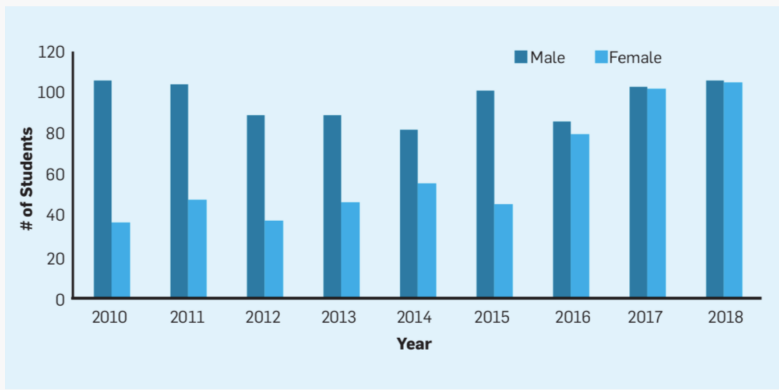
Without any compromises to admission standards, academic integrity, or changing the curriculum to suit women.

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My Experience

Trip to Google Pittsburgh during freshmen orientation

My Experience

The Gates-Hillman Center, home of the School of Computer Science

My Experience

Spring Carnival, a CMU tradition

My Experience

DEFCON 29 Finals with the Plaid Parliament of Pwning (PPP)

My Experience

Faculty pulling out lightsabers during graduation ceremony
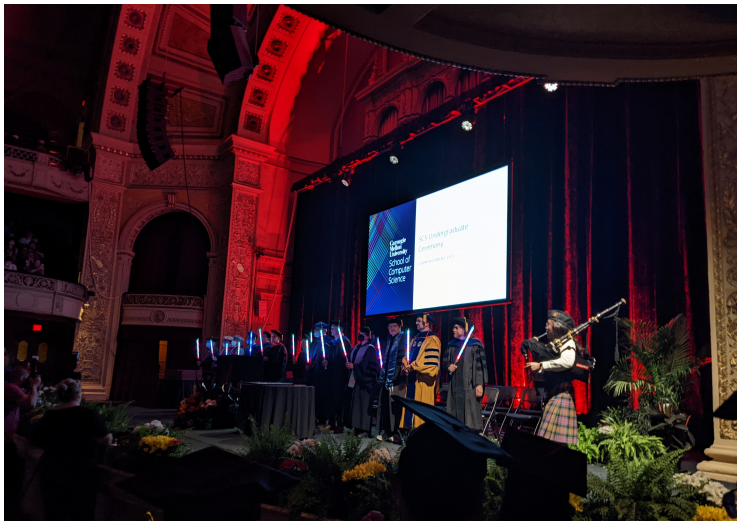
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- 4 years of hard work is an equalizer - people who come in knowing nothing about CS graduate knowing as much as, if

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Internships

- Pre-college: Saleswhale (Singapore, YCS16), conversational AI platform, acquired by 6sense 2022
- Freshmen year: Asana (San Francisco), project management platform
- Sophomore year: Facebook (Menlo Park)
- Junior year: Jane Street (New York), quantitative trading firm
- Senior year: Jane Street (New York + London)

Misconceptions

- I need to already be a programming genius to have a chance to get into CMU SCS.
  False: most enrolled students do not have significant CS background

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  False: almost all Singaporeans I know who studied CS in the US go on to high paying tech jobs or top graduate programs.

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- I will only apply for the top n schools for CS on USNews.
  See next slide...

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Choosing the right CS program

- Key takeaway: use CSRankings instead of USNews for CS program rankings
- USNews score is heavily "reputation-based" from "expert opinion", favors legacy and prestige over current research output
- `https://csrankings.org`
- Based on publications to the most selective conferences in the world, good indication of where all the top minds are

Background ○
College Applications ○
Scholarships ○
Scholarships ○○○
Computer Science @ CMU ○○○
My Experience ○○○○○○
Internships ○
The Insider ○○●

CSRankings.org

CSRankings: Computer Science Rankings

CSRankings is a metrics-based ranking of top computer science institutions around the world. **Click on a triangle (▶)** to expand areas or institutions. **Click on a name** to go to a faculty member's home page. **Click on a chart icon** (the 📊 after a name or institution) to see the distribution of their publication areas as a [bar chart ▾]. **Click on a Google Scholar icon** (📖) to see publications, and **click on the DBLP logo** (📂) to go to a DBLP entry. *Applying to grad school? Read this first.* **Do you find CSRankings useful? Sponsor CSRankings on GitHub.**

Rank institutions in [North America ▾] by publications from [2013 ▾] to [2023 ▾]

All Areas [off | on]

AI [off | on]
- ▶ Artificial intelligence ☑
- ▶ Computer vision ☑
- ▶ Machine learning ☑
- ▶ Natural language processing ☑
- ▶ The Web & information retrieval ☑

Systems [off | on]
- ▶ Computer architecture ☑
- ▶ Computer networks ☑
- ▶ Computer security ☑
- ▶ Databases ☑
- ▶ Design automation ☑
- ▶ Embedded & real-time systems ☑
- ▶ High-performance computing ☑
- ▶ Mobile computing ☑
- ▶ Measurement & perf. analysis ☑
- ▶ Operating systems ☑
- ▶ Programming languages ☑
- ▶ Software engineering ☑

Theory [off | on]
- ▶ Algorithms & complexity ☑

| #	Institution	Count	Faculty
1	▶ Carnegie Mellon University 🇺🇸 📊	18.3	165
2	▶ Univ. of Illinois at Urbana-Champaign 🇺🇸 📊	14.2	116
3	▶ Univ. of California - San Diego 🇺🇸 📊	11.9	117
4	▶ Massachusetts Institute of Technology 🇺🇸 📊	11.2	95
5	▶ Georgia Institute of Technology 🇺🇸 📊	10.5	139
6	▶ Stanford University 🇺🇸 📊	10.3	69
7	▶ University of Michigan 🇺🇸 📊	10.1	99
8	▶ University of Washington 🇺🇸 📊	10.0	80
9	▶ Univ. of California - Berkeley 🇺🇸 📊	9.6	90
10	▶ Cornell University 🇺🇸 📊	9.3	82
11	▶ University of Maryland - College Park 🇺🇸 📊	8.3	85
12	▶ Northeastern University 🇺🇸 📊	7.6	78
13	▶ University of Wisconsin - Madison 🇺🇸 📊	7.3	72
14	▶ Columbia University 🇺🇸 📊	7.1	57
15	▶ Purdue University 🇺🇸 📊	7.0	74
15	▶ University of Texas at Austin 🇺🇸 📊	7.0	49
17	▶ University of Toronto 🇨🇦 📊	6.9	92
18	▶ University of Pennsylvania 🇺🇸 📊	6.8	73

Advice To My 18 Year-Old Self 1: Expected Value Decision Making

Think in terms of expected value when doing decision-making:

$$\mathbb{E}[X] = \int x \Pr(x) \, dx$$

Example

You can pay \$3 to play a game with me where I will roll a fair die and pay you the dollar amount of the result. Do you play this game?

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Yes! $\mathbb{E}[X] = \sum_x^6 \frac{1}{6} x = 3.5 > 3$

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Advice To My 18 Year-Old Self 1: Expected Value Decision Making

Example

Should I study in the US?

Outcomes given "Study in US"	Value	Prob.	Outcomes given "Don't study in US"	Value	Prob.
Good-paying job	10	0.3	Good-paying job	7	0.3
Ok-paying job	7	0.3	Ok-paying job	4	0.5
Can't get job	2	0.2	Can't get job	2	0.1
Ph.D	4	0.2	Ph.D	3	0.1

X=happiness, utility, future money, whatever you care about

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> | Ph.D | 4 | 0.2 | Ph.D | 3 | 0.1 |

X=happiness, utility, future money, whatever you care about

$\mathbb{E}[X \mid \text{study in the US}] = 10 \times 0.3 + 7 \times 0.3 + 2 \times 0.2 + 4 \times 0.2 = 6.3$

$\mathbb{E}[X \mid \text{do not study in the US}] = 7 \times 0.3 + 4 \times 0.5 + 2 \times 0.1 + 3 \times 0.1 = 4.6$
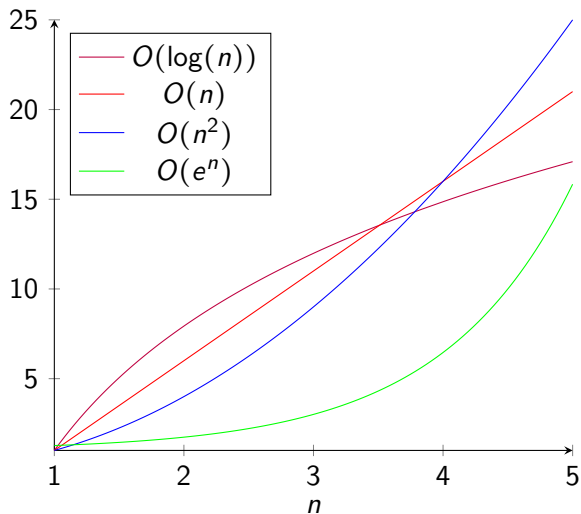
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Advice To My 18 Year-Old Self 2: Exponential Growth

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Some things that compound:

- Learning
- Money
- Building an audience
- Startup growth

Be some proportion (e.g 1%) better every day to achieve exponential growth

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"The trouble with exponential growth is that the curve feels flat in the beginning... Something that grows exponentially can become so valuable that it's worth making an extraordinary effort to get it started." - Paul Graham, Y Combinator founder [1]

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[1] http://www.paulgraham.com/greatwork.html

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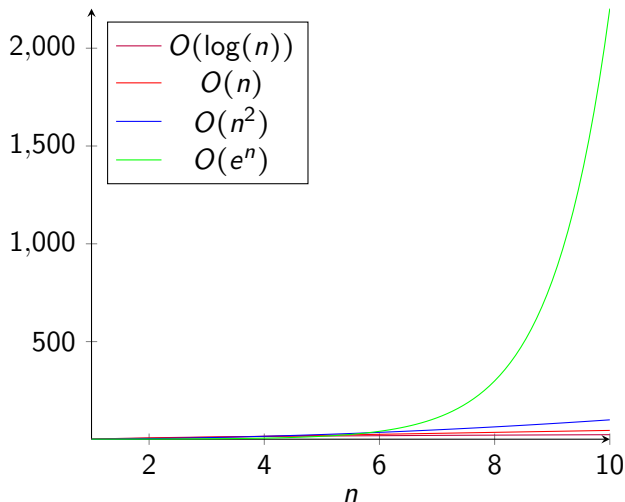
Some possible questions...

- I might be interested to study CS but I am not sure, how should I decide?
- How do I prepare for CS before college?
- Is studying CS overseas worth the return on investment?
- Should I take a scholarship?
- How do I get an internship in the US as an international student?
- Is it hard to make friends overseas?
- Racism and safety in the US?
- Are my career prospects in the US worse because I am a foreigner?
- How is working in tech like in the US?
- Internship and full-time salary information?

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