



CS 106S Week 9 (Last Class)



What's Next? Recap, Boba Party, and 106S++;

cs106s.stanford.edu, Autumn 2024

Agenda for Today

- 1 boba party!  as promised :)
- 2 brief recap & discussion of the quarter
- 3 CS106S++; i.e. frontiers of CS & Social Good, general Stanford stuff, AMA questions
- 4 final check-off form and goodbye 



Quarter Recap



CS106S Coding for Social Good

Autumn 2024

Lathrop 190

Thursday 4:30-6:20pm

[News](#)

[Instructors](#)

[Schedule](#)

[Syllabus](#)

CS 106S is a survey course on the applications of fundamental computer science concepts from CS 106B to problems in the social good space (such as health, environment, cybersecurity, trust & safety). Some of the topics we will cover include satellite imagery, tumor classification with basic machine learning, sentiment analysis of tweets on refugees, and the ethical obligation of good security. We introduce JavaScript and the groundwork of web development, with no expectation of prior experience in these areas. Recommended prerequisite/corequisite: CS 106B.

Week 1

```
15 const LOCALE = globalThis.navigator.language
16
17 const div = document.body.appendChild(document.createElement('div'))
18 const list = div.appendChild(document.createElement('ol'))
19
20 const dayNames = new Map()
21
22 for (let i = 0; i < 7; ++i) {
23   const d = Temporal.PlainDate.from({
24     year: Temporal.Now.plainDateISO().year,
25     month: 1,
26     day: i + 1,
27   })
28
29   dayNames.set(d.dayOfWeek, d.toLocaleString(LOCALE))
30 }
31
32 for (const num of [...dayNames.keys()].sort((a, b) =>
33   document.createElement('li'),
34   { textContent: dayNames.get(num) },
35 ))
```

JS

Intro to JavaScript and
Ciphers

Week 2



Sentiment Analysis &
Refugee Tweets

Week 3

Google Earth Engine

Search places and datasets...

Scripts Docs Assets

New Script

Get Link Save Run Reset Apps

Inspector Console Tasks

Welcome to Earth Engine! Please use the help menu above (ⓘ) to learn more about how to use Earth Engine, or visit our help page for support.

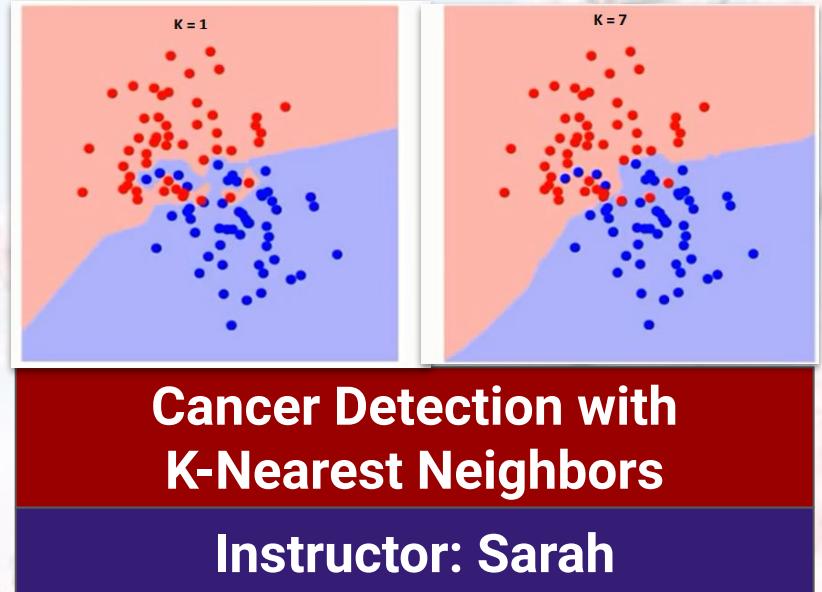
Map Satellite

North Atlantic Ocean

CS for Climate Change:
Google Earth Engine

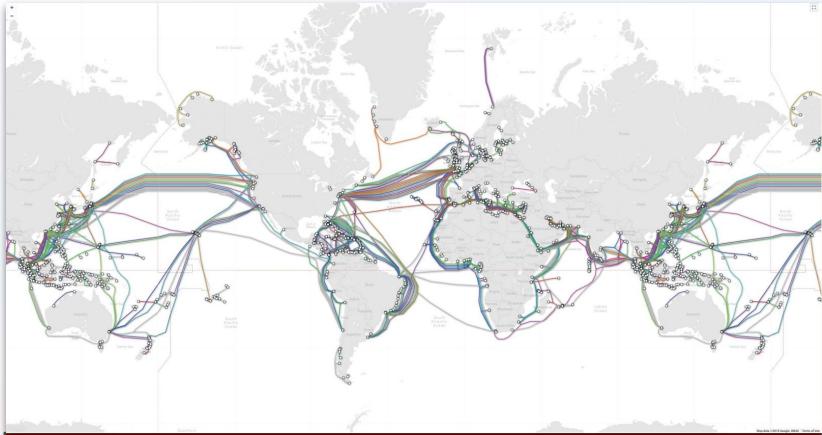
Benjamin Yan, CS106S 2024

Week 4



Stanford | ENGINEERING
Computer Science

Week 5

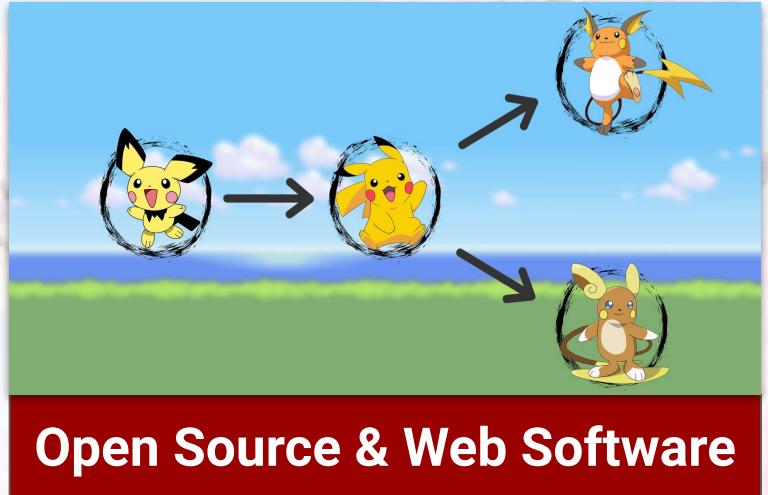


Cybersecurity & Ethical Hacking

Instructors: Joey & Cody,
catshare website by Aditya

Benjamin Yan, CS106S 2024

Week 6



Open Source & Web Software

Stanford | ENGINEERING
Computer Science

Week 7



(Optional) Trust & Safety

Week 8



Week 9



Boba Party & What's Next?

Benjamin Yan, CS106S 2024

And that's a wrap!



Stanford | ENGINEERING
Computer Science

cs106s++;

Plenty of Majors & Programs Out There

majors.stanford.edu/majors



Computer Science



Creative Writing >



Earth and Planetary Sciences >



Earth Systems >



Linguistics >



Management
Science and
Engineering >



Data Science >



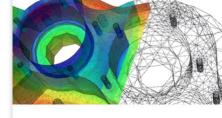
Data Science &
Social Systems >



Economics >



Education >



Mathematical and
Computational
Science >



Mathematics >

<https://majors.stanford.edu/majors>

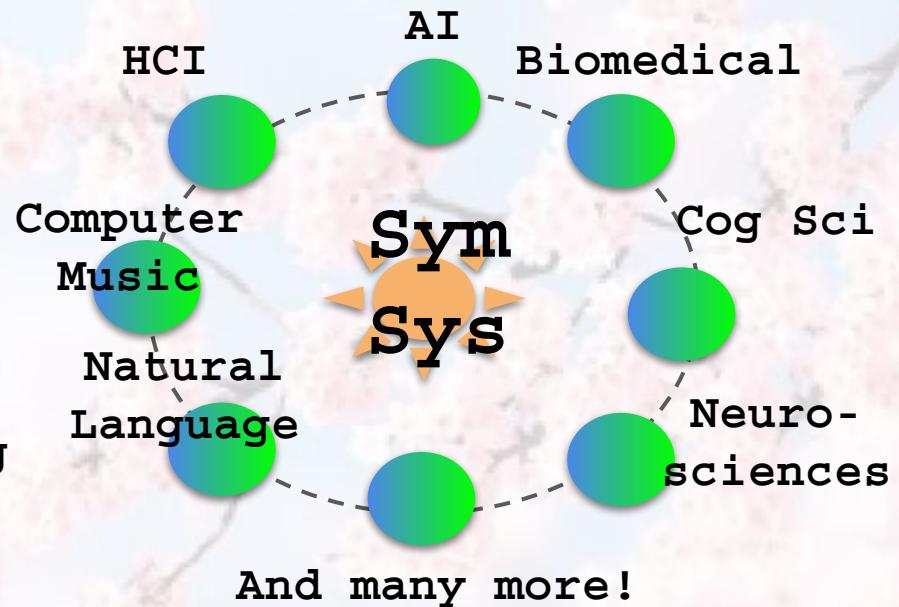
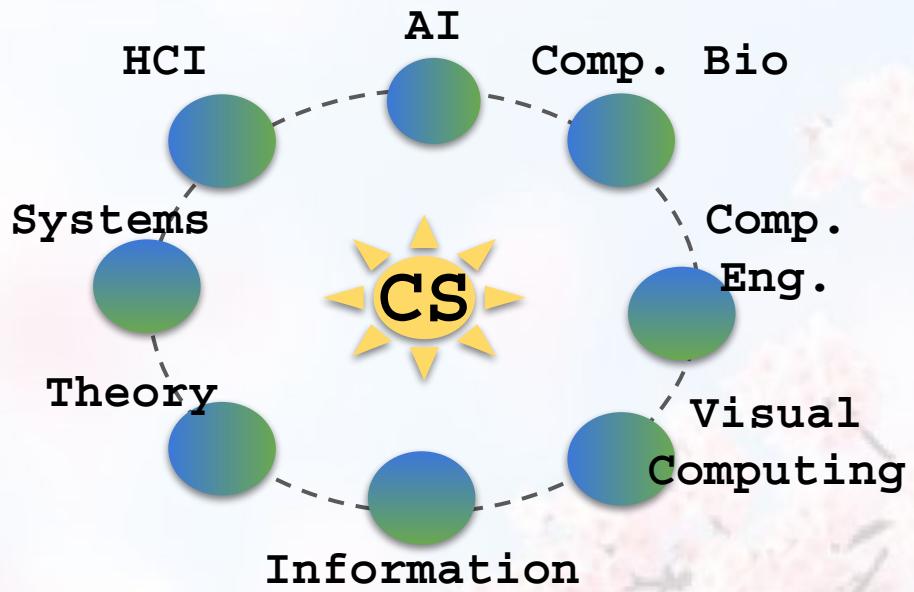
CS Coterm MS Program

- Earning an MS degree in computer science, at the same time as earning your BS degree.
- Roughly synonymous with 4+1 / 4+2 programs at other universities – e.g., I'm "slow"-terming with 4 undergrad ('20-'24) and 2 masters-only ('24-'26) years. Sixth year incoming haha :)
- Stellar flexibility with your undergrad – **I've met X Major + CS co-term for essentially any major you can think of**, e.g., Math, Sym Sys, English, Political Science, Geophysics, Music, TAPS, etc.



Major Tracks / Concentrations

Though you may not be planning to major in **CS** or **Sym Sys** (usually the two most popular majors taking this course), the broad areas still might be of interest to you!

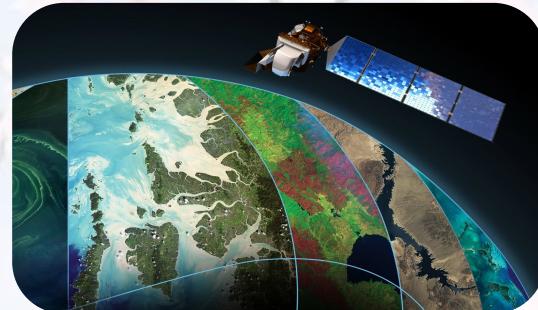


Artificial Intelligence

Note: Course mentions don't necessarily equate to endorsements lol, though I do encourage exploration and seeing what you like and may want to specialize in!

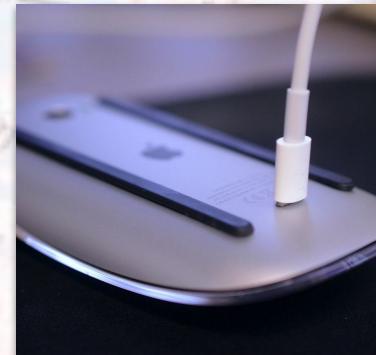
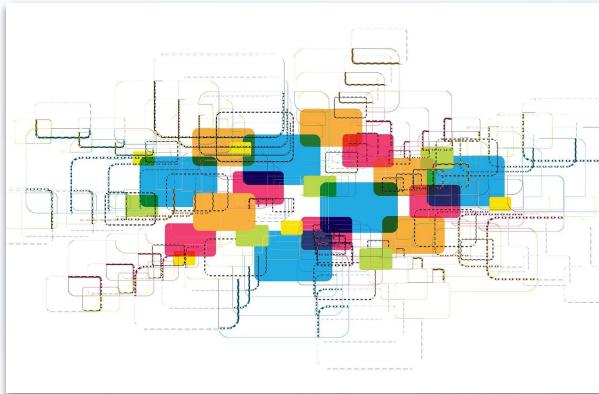
- Logic, probability, statistics, mathematical models, language & reasoning
- Courses include: CS 124, CS 221, CS 229, CS 224N, CS 231N, etc.
- A 2-unit course this spring (with speakers such as Peter Norvig in prior years), taught by a former student of mine! [**CS 21SI: AI for Social Good**](#)

Natural Language Processing	Computer Vision
Robotics / RL	Machine Learning



Human-Computer Interaction (HCI)

- Interdisciplinary track that delves into how people interact with and use computational devices (e.g., handheld electronics, laptops, supercomputers)
- Emphasis on user-centered design and “front-end” programming, e.g., creative and informative visualization, easy-to-use & accessible UI/UX, collaboration.
- Courses include: CS278 (Social Computing), CS 247A (Design for AI)

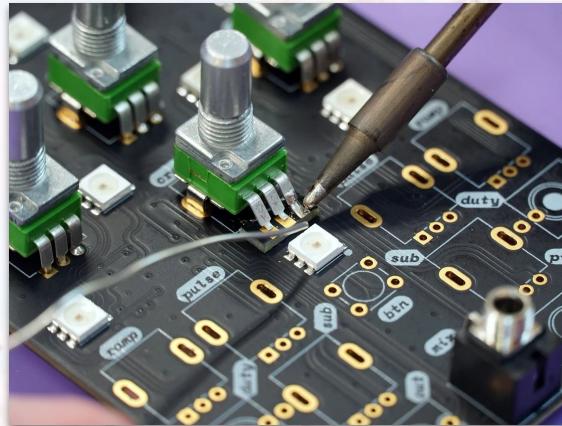


Computer Engineering

- **Intersection of software and hardware, or CS/EE.** Three principal areas: (1) Networking, (2) Digital Systems, (3) Robotics and Mechatronics
- Courses include: EE108 (Digital Systems Design), EE180 (Digital Systems Architecture), EE271 (Intro to VLSI Systems)

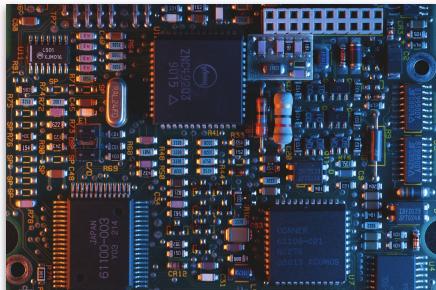
CS

EE



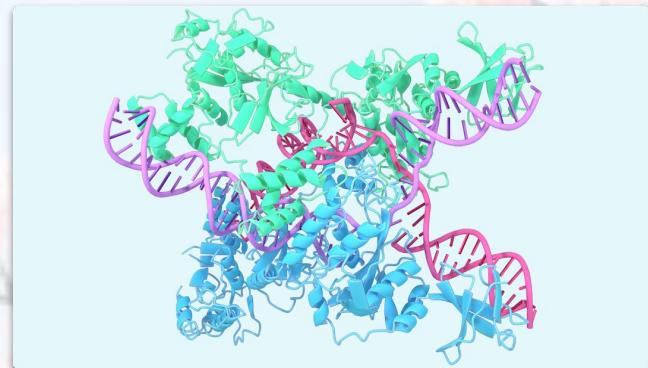
Computer Systems

- Design & implementation of computer systems, e.g., compilers, databases, Unix/Linux operating systems, networks, cybersecurity infrastructure
- Memory architecture and optimization, pointers (**char** stars), bit/bytes, etc.
- **Relevant Classes** – CS107: Computer Organization & Systems, CS111: Operating Systems Principles, CS 155: Computer & Network Security, CS143: Compilers



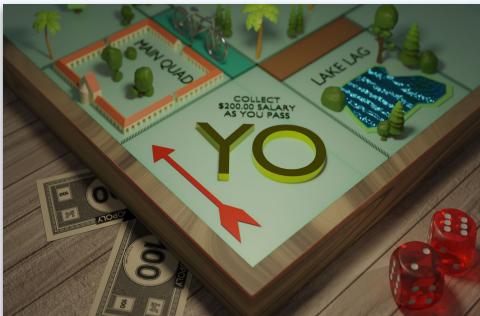
Computational Biology

- CS applications to biological and medical informatics areas, “Pre-Med + CS”
- **AlphaFold** – predicting the complex 3D structure of proteins from their amino acid chains. Has been used to predict COVID protein structures, and touted as the next big thing in drug discovery 🧪.
- Also, as a side quest, AlphaFold won the Nobel Prize in Chemistry 2024.
- **Courses include** – CS173A (Comp. Human Genomics) & CS279 (Structure & Org. of Biomolecules and Cells)



Visual Computing: Graphics

- Creation, manipulation, and analysis of visual stimuli via computers (images, videos, 3D geometry, virtual universes, AR/VR technology)
- **CS148: Intro to Graphics** – a massively popular gateway class, and also fulfills a wealth of requirements across programs (WAYS-CE, CS elective, etc)



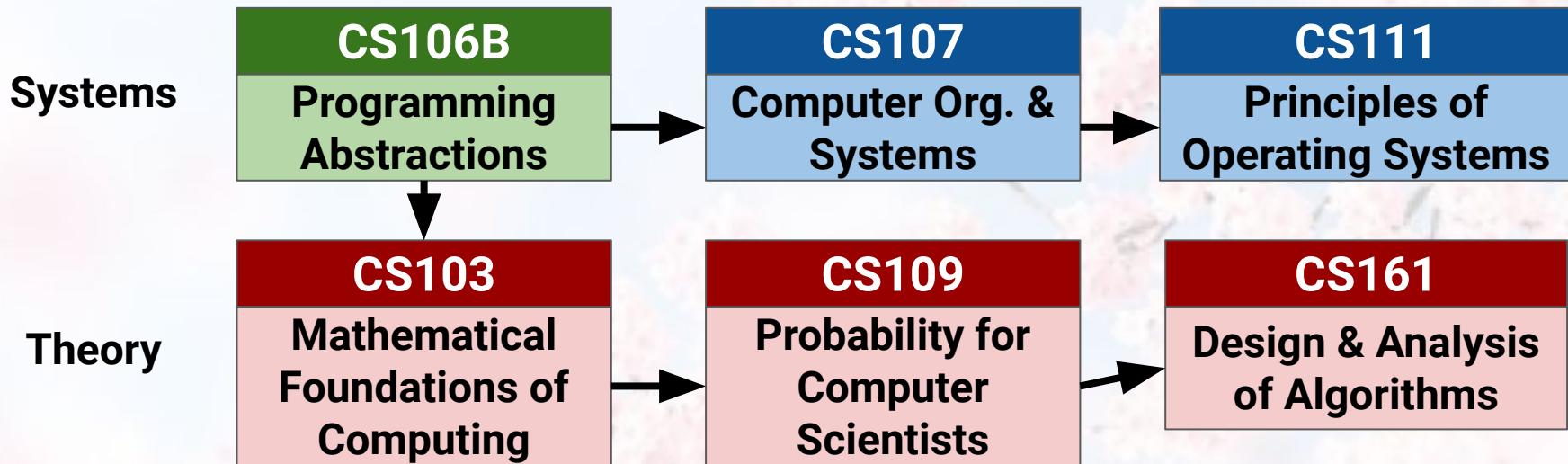
Images from Project Showcase at cs148.stanford.edu

- Other classes include CS 248A: Computer Graphics (Rendering, Geometry, Image Manipulation), CS 248B: Animation & Simulation



Stanford Computer Science Core

- The nucleus of classes CS majors/minors/enthusiasts generally take.
- **None of them are a litmus test** if you're going to be a great computer scientist or not. You can be an amazing computer scientist without really liking systems, recursive backtracking, Tone Matrices, etc.





Stanford CS + Social Good



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Stanford CS+Social Good

An organization of technologists, designers, and thinkers passionate about maximizing the benefits of technology and mitigating its harms.

[Look at Our Past Work](#)



Upcoming Events

[Events GCal](#)

[cs4good.com](#)



CS+SG Summer Fellowship



Global

2025 CS + Social Good Summer Self-Designed Fellowship

Offered by CS+ Social Good, Haas Center for Public Service

Design your own summer experience using technology to address core societal challenges.

INTERNSHIP PUBLIC SERVICE Design Your Own

Cardinal Quarter

Summer
DEADLINE:
February 4, 2025

OPEN TO:
Freshman
Sophomore
Junior
Senior



The Haas Center and **CS+Social Good** (a student-led organization) have partnered to launch the CS+Social Good Summer Fellowship program, which includes self-designed and pre-arranged fellowship placements.

Through the CS+Social Good Summer Fellowship, students will receive funding and support to work with an organization using technology to address social issues. Selected fellows will gain unique industry experience at a public interest technology company under the mentorship of an industry expert or faculty member.

Each CS+Social Good Fellow receives a base stipend of \$7,000 to cover most of the essential costs associated with an unpaid service experience. Financial aid and supplemental funding is available to students who qualify.

<https://solo.stanford.edu/opportunities/2025-cs-social-good-summer-self-designed-fellowship>

CURIS (Summer CS Research)

Stanford CURIS

Computer Science Research

This site lists research opportunities for undergraduate and masters students in computer science or which apply computer science in other fields. It also organizes the CURIS Summer Internship research program.

Getting Started in Research

Interested in getting started in research but don't know where to start? Use this guide to learn more about getting started with CS Research.

CURIS: Summer CS Internships

Learn more about CURIS, the CS summer paid internship in which undergraduate students work with a CS faculty member and their group, towards an identifiable research result.

CURIS Summer Projects

View the 2024 CURIS Summer Project listings. The CURIS student application period is open from February 3 - 17.

Year-round CS Projects

View listings for CS department projects seeking undergraduate and master's students during the academic year (for research units, hourly pay, or

CURIS Fellowships

Learn about CURIS Fellowships, which provide guaranteed funding for CURIS summer internships. The fellowships aim to provide early research

PURE: Paid Undergraduate Research Experience

Learn about the PURE program, which offers paid research opportunities for FLI students throughout the academic year.



<https://curis.stanford.edu/>

- Other departments have analogous summer research programs (e.g., SURIM in Math, SESUR in Earth Science), and they accept students across majors.

About Me

Probably should have left this to Lecture 1 but oh well ...



Stanford University (2020 – 2026)

- MS, Computer Science (Undecided Track), '26
- BS Double Major, Computer Science (AI) & Mathematics, '24
- Minor, Creative Writing (Prose Track), '24

Stanford in Oxford (Study Abroad)

- Tutorial in *English Lit & Creative Writing*, Win. 2024. Loved it. Tutor was amazing.

Activities

- NVIDIA – Systems Software Engineering
- CURIS Summer Research – Graph Networks
- Volunteering at Bay Area Science Olympiads – Golden Gate, Stanford, NorCal State
- Trying to read 52 books a year (about that ...)



I'm from Minnesota!



Brasenose College, Oxford, where I studied senior winter. Also setting of *Saltburn* movie lol.



My Lowlight Reel / Noteworthy Fails

This list is [incomplete](#); you can help by [expanding it](#).

- My first CS class (frosh Autumn 🍂) was CS109, which looking back was kinda sus – prereqs are CS106B, Math 51, and CS103 (soft)
- Nevertheless, Profs Lisa Yan & Jerry Cain made it very welcoming and it felt tough but doable. **But that wasn't the only CS class I took that quarter** 🤪
- Have you ever heard of a class called CS229 🙌: **MACHINE LEARNING?** 🙌 I wish I haven't. Goodness, yeah, that still registers as one of the dumbest and most notorious mistakes I've made here.
- It was brutal. I'm an idiot. But surely I learned my lesson right —

There's More!

- My frosh year (on Zoom), I didn't realize there was a front page on the CS program sheet – and ended up taking CS107 before I took 106B. Wtf Ben
 - **How did that go?** Uhhhh
- Somehow, I was paddling above water (barely), until the bottom fell out on **Assignment 4: Into the Void**

Assignments Submitted	Days Late	Functionality Review
assign4: Into the void*	Sat Feb 20 23:54	3 25/92 permitted



OOPS! Not even going to talk about Binary Bomb or Heap Alligator



- At the end of that winter quarter, I passed just half my units, which was quite demoralizing ngl. A lot of time was spent mounting a desperate comeback in 107 (I think 106B would have helped hmm 😐).



More!



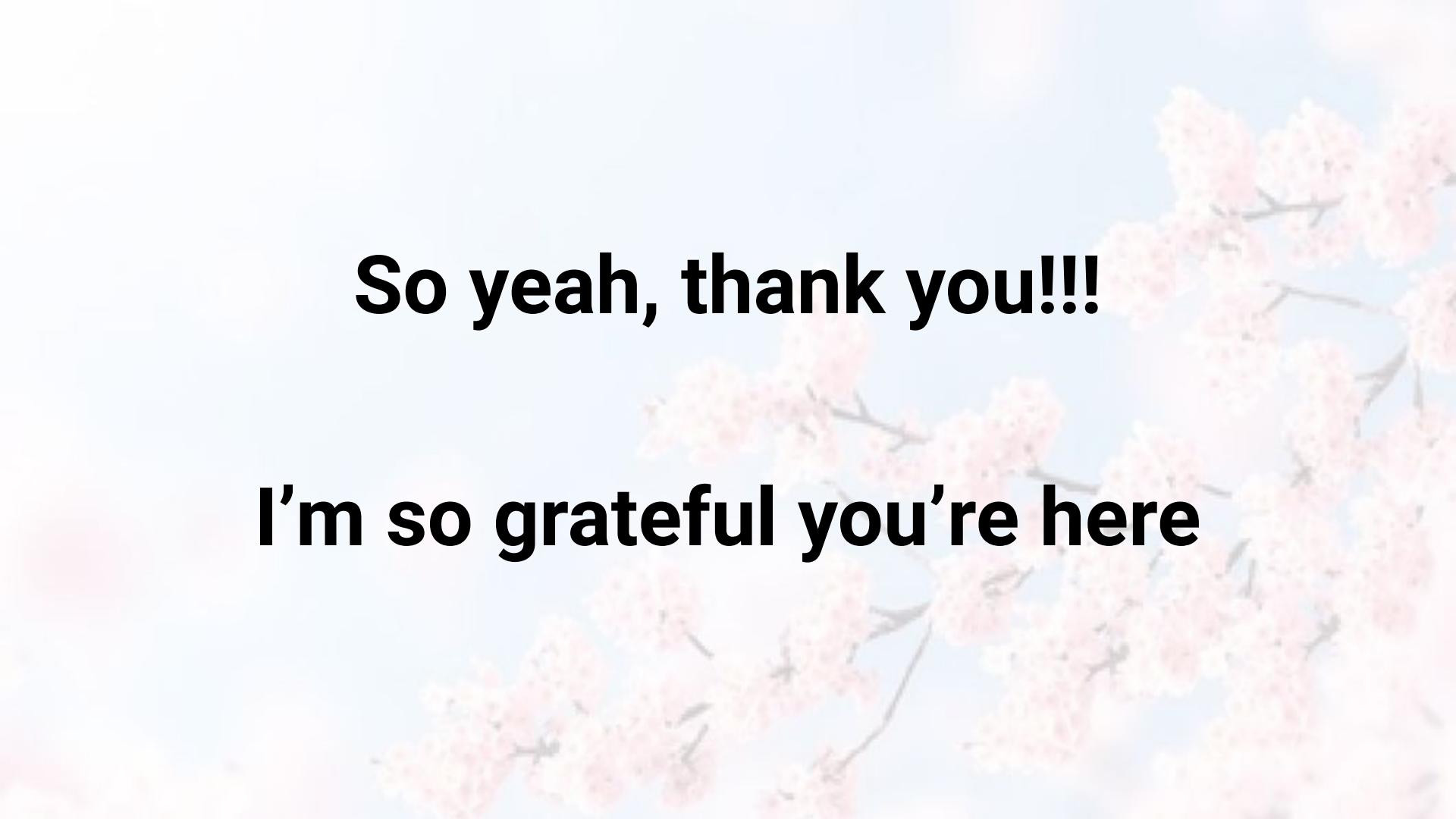
- I was also, at various points, a **Political Science** major and **Physics** major – if you can believe it. Both ended spectacularly badly, due to challenging courses in Chinese Politics and Statistical Mechanics, respectively.
- Still surprised I got to the finish line of my undergrad, definitely didn't seem that way for like a solid four years.
- **Aight, that's most of it lol (for now)**, not trying to turn academic self-sabotage into an art 😊



Hope



- On the bright side, I later took CS110 (the predecessor to CS111) with Jerry, and some friends. The topics (Unix filesystems, networking, parallel processes) really appealed to me, and the class & Jerry greatly healed my confidence.
- I found the stuff in CS109 (probabilistic simulation & models, combinatorics) pretty cool, and made probability & analysis the focus of my Math BS.
- Three years later or so, **I'm still figuring out what kind of CS I really want to do lol.** There's plenty of areas I've decided I won't do well in. **But my dream is to become a full-time lecturer in CS somewhere. But we'll see haha, fingers crossed, praying to the stars that things work out** .
- I – and I'm sure many others – would not still be in my chosen field of study, if it weren't for **the compassion of students & others.** I love teaching this 1-unit wonder, and my students have given me so much joy and happiness.

A soft-focus background image of cherry blossom branches with pink flowers against a blue sky.

So yeah, thank you!!!

I'm so grateful you're here

With that, until next time friends – it's been a fun time



**Feel free to reach out anytime at bbyan [at] stanford [dot] edu,
at 507-244-0751, or in my office hours. Happy to catch up / chat!**



Course Eval

They'll release sometime in December I think – and **I'd really appreciate and value your honest, anonymous feedback there when you have time!** That would help me and the class immensely.



Check-Off Form!

A final **check-off form** (< 5 min to complete) for attendance & feedback!

For today, click the “Check-Off Form” link in the **Week 9** section of cs106s.stanford.edu.

Have a wonderful break! 🎅



Go Stanford! This weekend, the Big Game will be ours, and the drought will be over 🏈.