

Data Structures

Introduction

CS 225
Brad Solomon

August 24, 2026

Hope you
had a great
Summer!



UNIVERSITY OF
ILLINOIS
URBANA - CHAMPAIGN

!!
welcome to
CS 225!

Department of Computer Science

Announcements

This is where we would have announcements!

... if we had any today.

(We do they are baked into the day one lecture though)

Learning Objectives

Get to know course staff

Introduce this year's Honors Course

An overview of course expectations, goals, and structure

Logistics!

Who am I?



Brad Solomon (He/him/his)

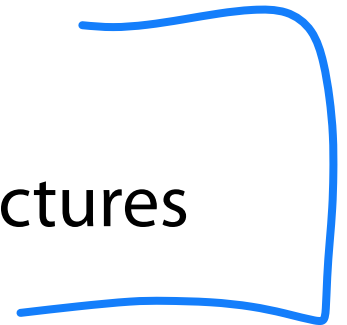
Teaching Associate Professor, Computer Science

2233 Siebel Center for Computer Science

Email: bradsol@illinois.edu

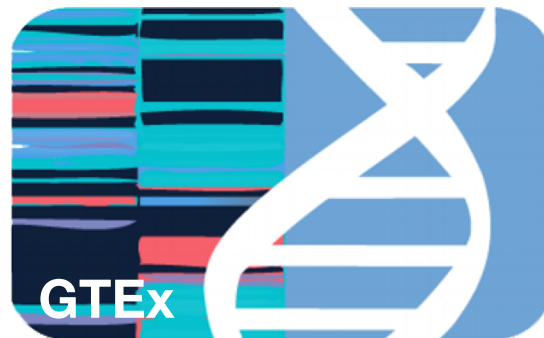
Hobbies: Board games, video games,
tabletop RPGs

Research Areas: CS Education,
Computational Biology, Data Structures

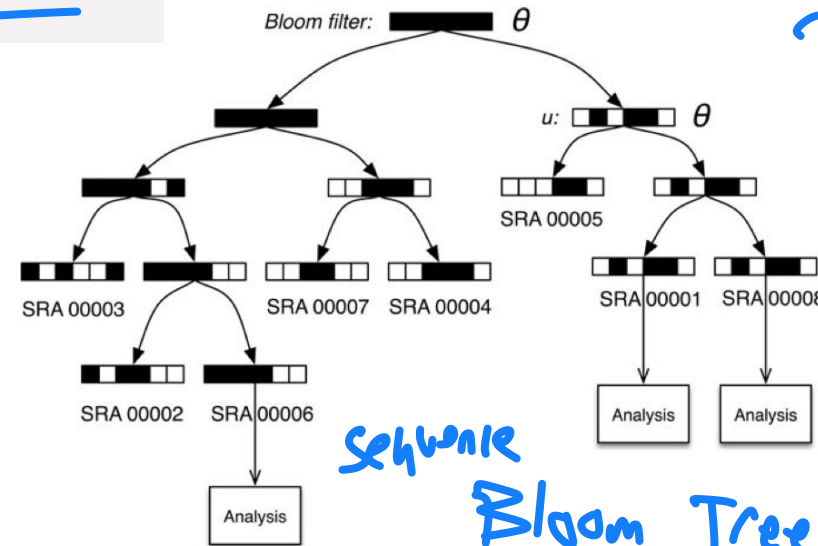
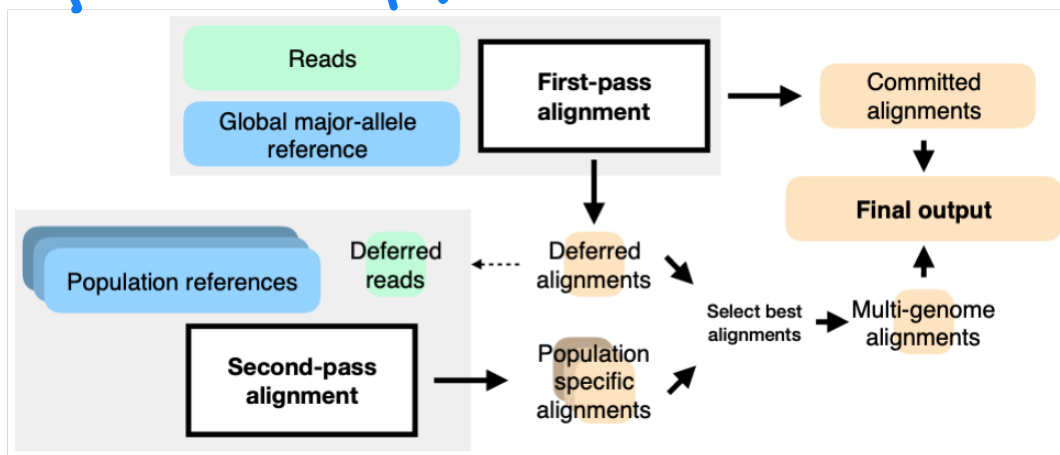


Brad Solomon

Strings!



processing pipelines



Sequencing Bloom Tree

Data structures

Fast search of thousands of short read sequencing experiments. Brad Solomon and Carl Kingsford. *Nature Biotech* 2016.

Reducing reference bias using multiple population reference genomes. Chen et al. *Genome Biology* 2021

Me!

Name Mattox Beckman

History PhD, Fall 2003, University of Illinois at Urbana-Champaign
Lecturer 2003–2015 Illinois Institute of Technology

Research Areas CS Education, Programming Languages, Mathematical Foundations of Computer Science

Specialty Partial Evaluation, Functional Programming

Professional Interests Teaching; Computer Science Education; Functional Programming; Semantics and Types; Category Theory

Personal Interests Irish Music; Cooking; Go (Baduk, Wei-Qi, Igo); Philosophy; Evolution; Meditation; Kerbal Space Program; Home-brewing; ... and many many more ...

CS 225 Honor Section

Have you ever wondered...

- ▶ What if variables could not be changed after you create them?
- ▶ What if functions were just another kind of data?
- ▶ What if your programming language was programmable?

No? Come find out anyway!

- ▶ We will use the Clojure programming language.
- ▶ Meeting: Mondays 17:00 in 0216 Siebel
- ▶ First class: September 14
- ▶ Class time will feature small group activities to introduce topics
- ▶ Final project: develop an old fashioned text adventure game!

Enrolling in CS 199-225

James Scholar Enrollment:

Syllabus

1. Register for CS 225 section AH (CRN 75824)
2. Fill out the appropriate Honors Credit Learning Agreement

Check your individual college for James Scholar deadlines

Standard Enrollment:

1. Register for CS 199-225 (CRN 40944)

This is a pass-fail grade and a 0-credit course

How to contact us?



Admin Email: cs225admin@lists.cs.illinois.edu

For best results, give a descriptive subject header!



It may take a day or two to get a response.

Discord: <https://discord.gg/YuEwhnR>

Don't DM course staff on Discord

Be respectful to one another online

Use Discord in class to ask questions!

lectures channel



Everything about CS 225

<https://courses.engr.illinois.edu/cs225/>

Information on:

Staff

Communications

Lab Sections

MPs

Exams

Grading

Academic Integrity

Semester-wide Schedule!



A surprise pop quiz!

I missed the Discord link. Where can I find it?

↳ class welcome email

↳ website → slides posted on Sunday

↳ syllabus

↳ Resources

When is exam 0? What is on it?

September 2-4 ← Next week!

If can't access PrairieTest:

1) Wait 24 hours

2) Email cs225 admin

Exam 0 (9/2 — 9/4)

An introduction to CBTF exam environment / expectations

Quiz on foundational knowledge from all pre-reqs

Practice questions can be found on PL

Topics covered can be found on website

Registration available now!

Expect ~24 hour delay after enrollment before PT access

Grading — Point Distribution

Category	Contribution	Notes
Machine Problems	240	<u>40</u> points each
Lab Assignments	120	<u>12</u> points each
Exams	480	<u>80</u> points each
Final Exam	<u>160</u>	
1000		

All MPs have a one-day late policy for 93% credit

There are no built-in extensions for labs

Grading — Final Grades

Points	Grade	Points	Grade	Points	Grade
$[930, \infty)^*$	A+	$[930, \infty)^*$	A	$[900, 930)$	A-
$[870, 900)$	B+	$[830, 870)$	B	$[800, 830)$	B-
$[770, 800)$	C+	$[730, 770)$	C	$[700, 730)$	C-
$[670, 700)$	D+	$[630, 670)$	D	$[600, 630)$	D-
		$(600, 0]$	F		

* An A+ requires a minimum amount of points and/or the support of one or more course staff members who have found some part of your work exceptional.

Extra Credit Opportunities

MP Extra Credit Submission (20 pts)

4 points per MP (first MP no early submission)

Problems of the day (30 pts)

1 point per PoTD

Course Feedback Surveys (8 pts)

2 points per survey; 4 points for Informal Early Feedback

Extra Credit Opportunities

Bonus Labs (3 points each)

Replacement lab sections will be exam review

Removed labs will still be available for EC

Current EC total is 66 points *

Retake Exam

Details can be found on [Exam Page](#)

Final grade will be a 70-30 averaging (higher-lower)

Exams 0 — 4 will be available for retake

Sign up once and take whichever singular exam you want

This can result in lowering your final grade!

Extension Policy

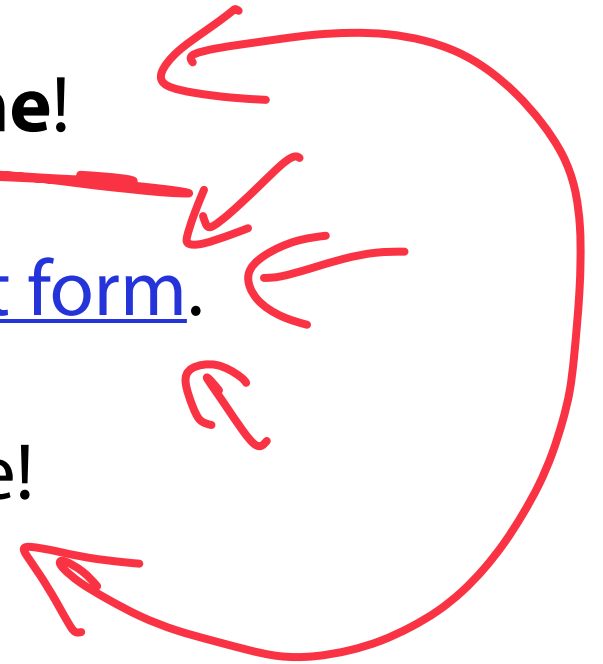
Every MP has a built-in 24-hour extension for 93% credit

Every student gets one free extension on any assignment!

Free extensions are 48 hours from **original deadline!**

To get your extension, fill out the [extension request form](#).

For best results, request 48 hours ahead of deadline!



Plagiarism Policy

Don't share your code with anyone! Ever!

Don't use or look up code solutions from any source!

Don't use generative AI tools!

Infractions will result in 0s on the assignment with increasingly steep penalties for repeated violations

All infractions will be reported through FAIR and remain on your permanent record.

Statement on Mental Health

This class has a relatively high workload. If you are struggling...

Consider reaching out to course staff!

Come to any faculty member's OH (email to schedule a one-on-one)

Take advantage of extension request forms!

UIUC offers a variety of confidential services:

Counseling Center: 217-333-3704

610 East John Street Champaign, IL 61820

McKinley Health Center: 217-333-2700

1109 South Lincoln Avenue, Urbana, Illinois 61801

Diversity, Equity, and Inclusion

"If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of..."

Course CAs

Faculty

Campus Belonging Office ([Link](#))

The Office of Student Conflict Resolution ([Link](#))

CS CARES ([Link](#))

Questions about course policy / structure?





What is this course about?



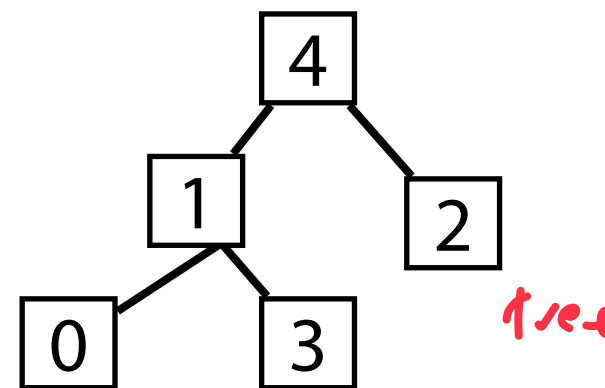
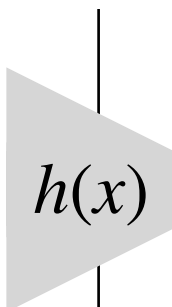
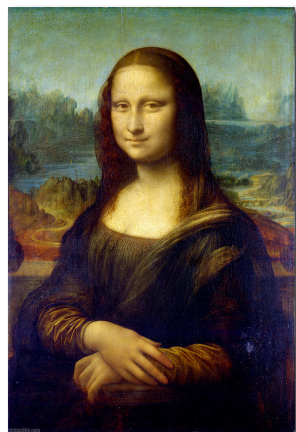
CS 225 — Course Goals

Understand foundational data structures and algorithms

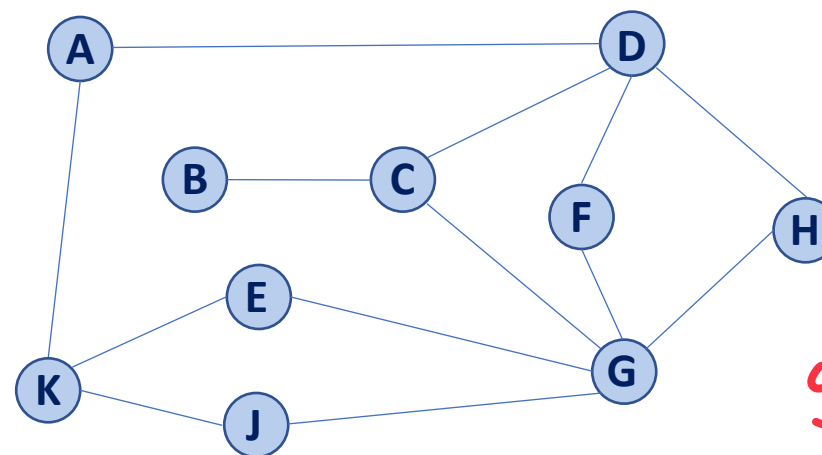


List

hash table



tree



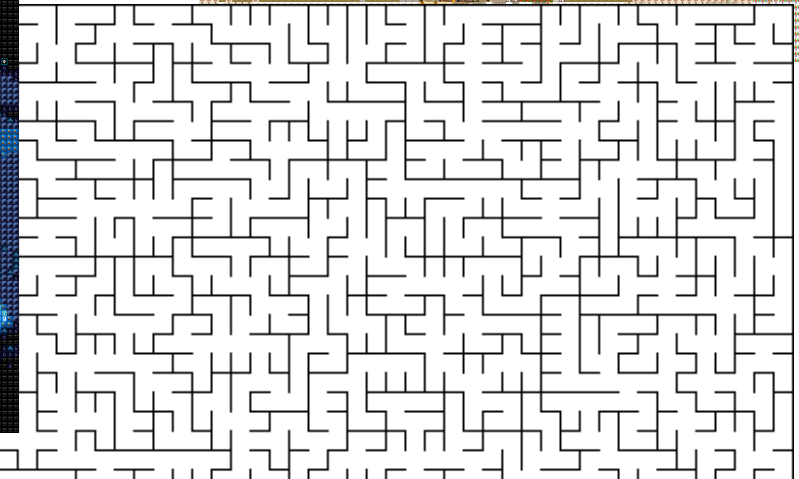
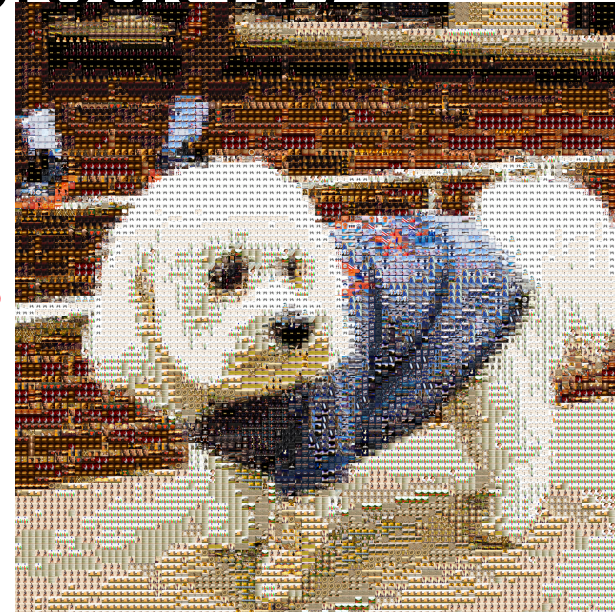
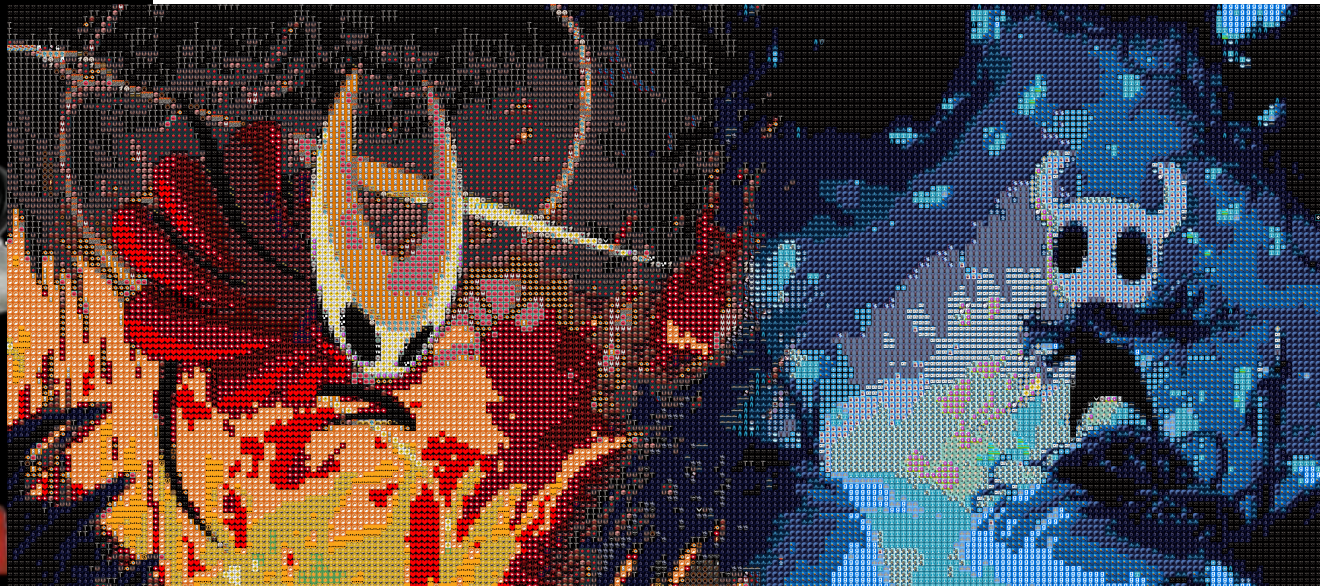
graph

CS 225 — Course Goals

Justify appropriate algorithms for complex problems

Decompose problem into supporting data structures

↓ *Analyze efficiency of implementation choices*



CS 225 — Course Goals

Implement intermediate difficulty problems in C++

the segmentation is not my fault



I am boundless,
eternal



okay ❤️

yay ❤️

11:50 PM

✗ **[0/4]** test_invert()

Max points: 4

Earned points: 0



Segmentation fault

You can't defeat me.

I know, but he can.

```
valgrind --leak-check=full ./mai
```

THIS IS FINE.

Submitted answer 1

Submitted at 2023-08-30 21:35:35 (CDT)

invalid, not gradable

- ✗ **[0/5]** A StickerSheet with no stickers works
- ✗ **[0/5]** StickerSheet does not duplicate stickers in memory
- ✗ **[0/5]** StickerSheet behaves correctly when a sticker is updated

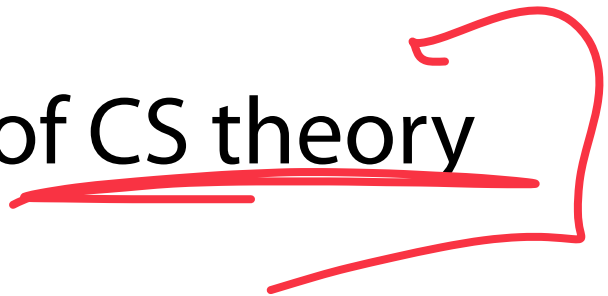
CS 225 — Course Goals

Understand foundational data structures and algorithms

Justify appropriate algorithms for complex problems

Implement intermediate difficulty problems in C++

Improve your foundation of CS theory



Surprise Survey!

On a scale of 1—5, how confident are you in your coding skills?

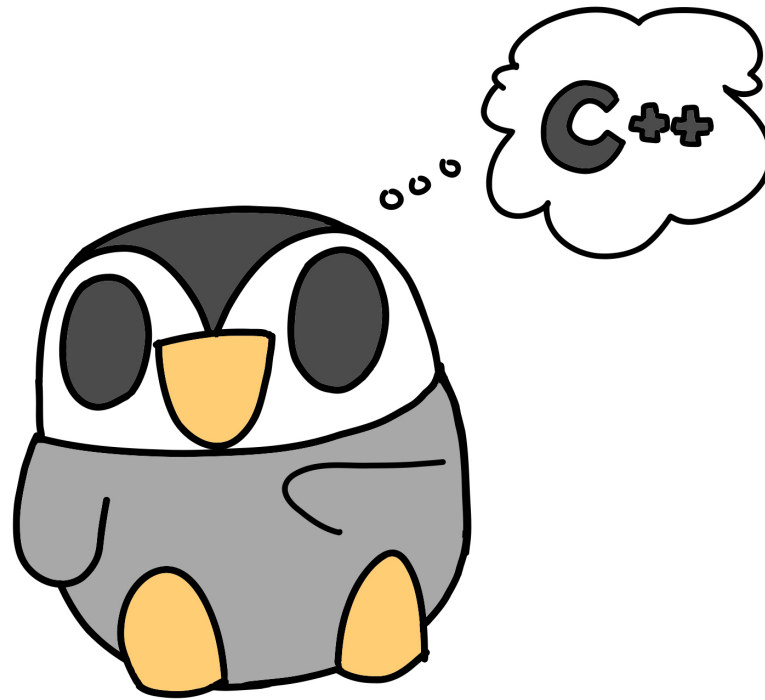
- 1) Not at all confident
- 2) Slightly confident
- 3) Somewhat confident
- 4) Confident
- 5) Very confident



Respond at <https://clicker.cs.illinois.edu/>

Join Code: 225

What about C++



Lectures from Previous Semesters Covering C++ Available Here

https://mediaspace.illinois.edu/playlist/dedicated/177553201/1_s10ctiib/1_z2cz05fi

(Optional) Open Lab This Week

This week's lab is open office hours

Focus is making sure your machine is setup for semester

Installation information available on website

