

CS 3110

Lecture 26: Victory Lap

Prof. Clarkson

Fall 2014

Today's music: "We are the Champions" by Queen

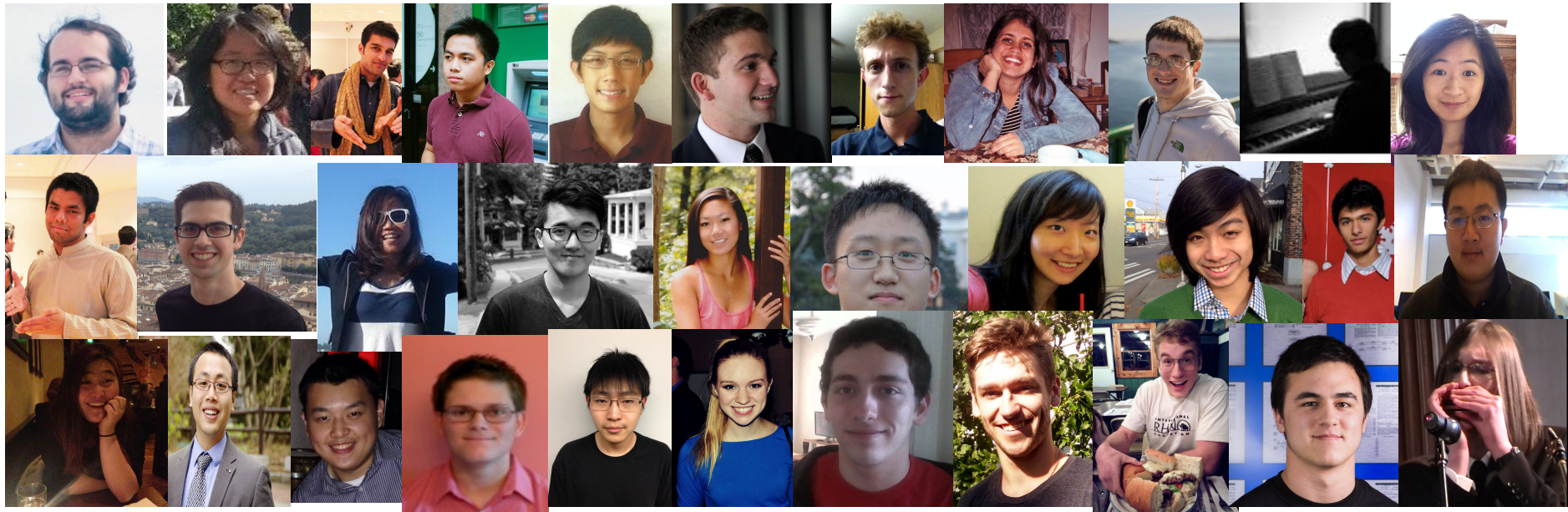
Victory Lap

Extra trip around the track by the exhausted victors (us) 😊



Thank you!

Huge thank you to TAs and consultants!



Thank you!

Piazza heroes:

Top Student Contributors

Suraj Bhatia

217 contributions; 84 days online

Tongcheng Li

177 contributions; 93 days online

Ross Tannenbaum

143 contributions; 97 days online

Howon Song

127 contributions; 82 days online

Alexander Sommer

116 contributions; 74 days online

Thank you!

And a huge thank you to all of **you!**

- You surmounted a daunting challenge
- You occasionally laughed at my dumb jokes 😊

I <3 this course. You make it all worthwhile.

What did we learn?

- You feel exhausted...
- You're tired of coding...

...step back and think about what happened along the way

What did we learn?

From the syllabus:

- Alternative programming paradigms, especially functional and concurrent programming
- Writing and using specifications
- Modular programming and data abstraction
- Reasoning about program correctness
- Reasoning about system performance
- Useful and efficient data structures

...and some cross-cutting, big ideas...

1. Syntax and Semantics

- Every language feature can be defined in isolation from other features, with rules for:
 - syntax
 - static semantics (typing rules)
 - dynamic semantics (evaluation rules)
- Divide-and-conquer!
- Entire language can be defined mathematically and precisely
 - SML is. Read *The Definition of Standard ML (Revised)* (Tofte, Harper, MacQueen, 1997).
- Learning to think about software in this “PL” way has made you a better programmer even when you go back to old ways
 - And given you the mental tools and experience you need for a lifetime of confidently picking up new languages and ideas

2. Benefits of Immutability

- Programmer can alias or copy without worry
- Parallel programming easier with immutable data
- But mutability is appropriate when you need to model inherently state-based phenomena
 - or implement some efficient data structures

3. Programming languages aren't magic

- Pattern matching is something you can implement yourself
- Interpretation of a language is something you can implement yourself
- From a small set of elegant primitives with precise semantics, we have built a world that runs on software!

4. CS has an intellectual history created by people like you



What next?

- Follow-on courses:
 - CS 4110 Programming Languages and Logics (how to define and reason about programming languages)
 - CS 4120 Compilers (how to implement programming languages)
- Join the course staff?
 - CS department will send out email with URL for application site
- Stay in touch
 - Tell me when 3110 helps you out with future courses (or jobs!)
 - Ask me cool PL questions
 - Drop by to tell me about the rest of your time in CS (and beyond!)... I really do like to know
- GO DO AMAZING THINGS WITH YOUR LIFE

Finally

- The most important idea of this course:
 - complicated artifacts can be broken down into small pieces
 - you can then study those small pieces and understand how they work in isolation
 - then you can understand why their aggregation achieves some goals
- Examples: the OCaml language, a module you designed, a formal logic
- That kind of analysis is applicable anywhere, not just programming

Please hold still for 1 more minute

WRAP-UP FOR TODAY

Final

- Tuesday, December 16, 9-11:30 am
- Covers everything in the course
 - except for guest lectures by Prof. Constable and Dr. Minsky
- Will not be a sample final posted on Piazza
 - We've only had 1 week of material since Prelim2! 😊
 - (and you know what kinds of questions to expect by now)
- Office hours:
 - I will try to get some extra consulting hours scheduled before final
 - I'm out of town for a research meeting for the week prior
- Three rooms, will be assigned by netid
- Closed book
 - But you may have **three** pages of notes
 - 8.5x11" two-sided 😊

Final Grades

- Fill out the course eval to get your +1%
 - Take time on this, especially the free response questions
- Today's office hours are the last for the +1% Meet Your Professor
- Participation +3%:
 - I'll be at the Tournament on Saturday and can manually fix any serial number issues with iClicker
 - but you have to bring your serial number(s) with you
- Final grades will be uploaded to registrar approx. 24 hours after final exam scores are released on CMS
 - < 24 hours after that, the registrar locks them, and I can't change them

Upcoming events

- **PS6 due today**, no late passes
- Tournament submissions due Saturday, 1 minute before noon
- Tournament: Saturday, 5 pm
- Final: December 16, 9 am

This is...

This is victory.

**THIS
HAS BEEN
3110**

Music: End credits from Final Fantasy IX