CSE 550: Systems for All

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Who we are
Ratul
Lequn
“q” pronounces like “ch”
Shanghai Jiao Tong University -> UW
Research: ML Model Serving (Advisor: Arvind Krishnamurthy), interested in building systems / writing code in general.
Hobbies: Cooking, Outdoor activities
Fun fact:
Course structure
CSE 550: Systems for All

Quals course that covers foundational systems topics from:
  Operating Systems, Networks, Distributed Systems, Databases

No “real” prerequisites
  Designed to allow first-year grads from other areas to engage
  Functional knowledge of real systems will be helpful

Gateway course to CSE 551, 552, and 561 or a terminal course for
students desiring breadth

Goal: A thorough understanding and appreciation of the work your
systems colleagues are doing!
Course organization

1. Read papers
   • Deeply read 1-2 per class
   • Shallow reads (optional)

Check out: [https://derekchia.com/how-to-read-a-research-paper-3-pass-approach/](https://derekchia.com/how-to-read-a-research-paper-3-pass-approach/)
   • Deep read = All three passes
   • Shallow read = 1\textsuperscript{st} pass
Course organization

2. Discuss papers
   • For each lecture, we will post a small set of questions on the assigned papers.
     • We'll create one thread per discussion question set.
     • You're required to add a comment to the discussion for each of the threads by 9am on
       the day of the class (to give time for everyone to read the responses before class.)
     • For each thread, pick one of the questions in the question set to answer.

   • Free-form discussion
Course organization

3. Lead paper discussion in groups of 2
   • Understand the key ideas and state of the art
   • Rough presentation content
     • What problem is being solved?
     • Paper’s key solution idea(s) / insights
     • Other ways to solve the problem (one source: optional readings)
     • State of the art (one source: optional readings)
     • Incorporate Ed discussion
     • In-class discussion questions
   • Sign up sheet on the course Web page

Ratul will do a short intro to the topic prior to that
Send your slides and other materials to Lequn after the class
Course organization

4. Two assignments
   • Meant to clarify the nature of systems contributions and tooling issues (a defining feature of Systems)
   • Done in groups of 2 or 3
   • Already posted (or will be soon)
Course organization

5. Project 3

- Independent research project or in-depth assignment from us
  - Seed ideas will be posted soon
- Groups of 2 or 3
- Conclude with writeup of results.
Course organization

No exams!
Tools

Canvas for projects/assignments
Ed for discussions
Slides posted on the Web page after the lecture
  • Adapted from Arvind and Kurtis

Feedback:
  • email/chat
  • mid-quarter eval (anonymous)
  • feedback.cs.washington.edu (anonymous)
Office hours

Opportunity to have more personal interactions with us

- Ratul: Immediately after class, and on-demand
- Lequn: Wed 2:30pm - 3:30pm at Allen 220
Grading

• Online discussions: 10%
• In-class discussion leading and participation: 10%
• Two assignments: 25% + 25%
• Project: 30%
Late policy, getting off-track

Each **person** gets three late days for reading responses.

If your assignments/projects will be late, reach out to us beforehand

Special circumstances: Come talk to us
Class attendance

It is a discussion-oriented class, so attending in person is important

But if you cannot make it, attend via Zoom
  • Link on Canvas calendar

Recording will be available
  • Quality might vary (again, class discussions)
Questions?
Course content
system

/sɪstəm/

See definitions in:
All  Physiology  Computing  Science  Gambling  Music

noun
plural noun: systems

1. a set of things working together as parts of a mechanism or an interconnecting network.
   "the state railroad system"
   Similar: structure  organization  order  arrangement  complex

2. a set of principles or procedures according to which something is done; an organized scheme or method.
   "a multiparty system of government"
   Similar: method  methodology  technique  process  procedure

Definitions from Oxford Languages
Our focus

Software systems
  • Though the overlap with hardware is large!

Understand how software systems achieve a specific external behavior
  • e.g., deliver videos, online social network, email, ML execution

Comprises of many components
  • Components interact and cooperate to provide overall behavior
  • They typically have (well) specified interfaces

Large-scale, running across thousands or millions of hardware devices
Let’s build a social network together

Assume that you have computer hardware
Common themes across systems

Correctness – does it work as advertised?
Reliability – stay functional as components fail
Performance
Scalability
Efficiency
Security