
CSE 331

Software Design & Implementation

Topic: Ethics Discussion

 **Discussion:** Should I make next lecture a work session?

Reminders

- Will not accept *any* work after Aug. 19 (Friday) at 11pm
- Please fill out course evals ASAP
 - Very valuable to me as a new instructor!

Upcoming Deadlines

- HW9 due Thursday (8/18)

Last Time...

- End-of-quarter timeline
 - Lectures
 - Final Grades
- System Integration

Today's Agenda

- Short discussion

Lecture Timeline

Last few lectures will be content-sparse. Will have lots of work time during class.

- Today's lecture is about the high-level ideas needed to build **massive** systems
- Next lecture will include information on **ethics in CS** and a **class discussion** on related topics
- Friday's lecture will start with **student demos** and end with a **course wrap-up**

Grading Timeline

- All work needs to be submitted to us by **Friday** at 11pm
- Course staff will finish grading HW9 and regrades by **Sunday evening**
- Grades will be posted on Canvas on late **Sunday night**
 - You should check that these are consistent with what you expected!
- Soham will calculate final GPA based on these grades on **Monday**
 - This is when I will account for extra credit and special circumstances
- Grades due to the university on **Tuesday at noon**

What's *still* missing

CSE 331 is about *how* to design and implement software

It's not about the important topic of *what* to build and *for whom*

- Even *before* the well-understood steps like *requirements analysis* (CSE 403 topic)

This is about our effect on *humans* and *societies*

- Implicit decisions you don't notice you're making are still decisions
- Good decision-making benefits from explicit understanding of ethics, values, differences among people/peoples, ...
- [Leaders of our field (e.g., faculty 😊) care a lot about this, but aren't always good at showing it 😞]
- See also: CSE 492E

The big stuff you hear about

- Black-box algorithm to assign length of prison sentences??
- Facial recognition technology for job screening??
- Bugs in self-driving cars
- Cameras that only see light-skinned people
- ...

*But it is **not** just the news items – software, like an engineered system – is full of value judgements*

Is software inherently amoral?

- Dijkstra's algorithm can help the elderly complete errands or a thief complete robberies
- Encryption can shield "good guys" or "bad guys"
- Surveillance technology can prevent human trafficking or find political enemies
- ...

Is this *your* problem?

- Old [?] view: We're trained to be engineers – others have to decide proper use
 - Ethicists, politicians, doctors, ...
 - Provocative quotation: *"My job is to make sure the missiles go up; somebody else decides where they come down"*
- But our understanding of the technology is unique – we have an essential role to play in the conversation
 - Which requires understanding not just the technology, but the people it affects and the tradeoffs
 - Can you communicate your technical choices to decision-makers?
 - Can others communicate their needs to you?

A familiar example

- Consider a simple graphical web app for giving walking directions on the UW campus
 - You know, just hypothetically 😊
- What assumptions that favor some people/peoples over others in your application?
 - Did you notice as you were doing your assignment?
 - What could/should/would you do about it?
- If you're stuck: *When might someone not prefer the shortest path and why?*

Some of your instructor's answers

1. Directions may include steps, which excludes people in wheelchairs
2. Directions do not favor well-lit paths, which is important for safety after dark, particularly for statistically-targeted groups (e.g. women or minorities)
3. Your website is not usable by blind users even though the underlying data is text-based
4. Any instructions only in English?
5. Other?

Fixable?

- Some of these issues are unfixable given the underlying data
 - Key idea behind the phrase “*data is biased*”
 - What you don’t collect is full of value judgments/assumptions!
- Others are fixable but should we *require* that?
 - The assignment was already difficult
 - There are features and tools for accessible websites
 - See also: CSE340
 - Regulation is an important check on economic incentive but can impede innovation
 - Cell phones didn’t used to support 911

Be explicit about inclusion

- If you don't spend the time to think about who your software includes, you will exclude more people
 - Diverse teams have an inherent advantage here!
- Embarrassing [?] fact: CSE 331 had “GUI for walking directions on the UW campus” for *ten years* before someone noticed that the course should include this short lecture
 - Ask your managers in your future projects
 - Ask your instructors in your future courses
 - Most importantly, ask yourself
- You're going to have a lot of impact on the world
 - Make it positive

Before next class...

1. Work on [HW9](#)
 - Let me know if you want to demo extra credit
 - Can be small things like a slightly different layout
 - Can be big things like adding a whole new feature
2. Wrap-up any regrades for [HW1-8](#)
 - Won't accept late work after the last day of class