CSE 331
Software Design & Implementation

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Connection to Ethics and Inclusive Software

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 more 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 women

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