CSE 580: Computing for Social Good

To be listed as CSE 580: Computing for Social Good, in the “Human-facing” quals bundle.

Fall 2024
Time: MW 3:00-4:20pm
Instructor: Kurtis Heimerl <kheimerl@cs.washington.edu>
Instructor Office Hours: By Appointment
TA: Lisa Orii <lisaorii@cs.washington.edu>,Marissa Radensky <radensky@cs.washington.edu>
TA Office Hours: By Appointment
Communications: Canvas
Location: CSE2 G04
Inspired by (https://docs.google.com/document/d/1gIclRPED-CHztyWpoZWjdK6iE-T2r9arsAOOSPYsdfE/edit?usp=sharing and https://raghavan.usc.edu/2019-spring-computing-for-social-good/)
Old 2023 syllabus: CSE580 SP2023 Computing for Social Good Syllabus
Old 2021 syllabus: CSE580 SP2021 Computing for Social Good Syllabus
Old 2020 syllabus: CSE599 SP2020 Computing for Social Good Syllabus

Introduction:

As the role of technology has grown, from mainframes to laptops to mobile phones and pervasive AI, so has the desire to leverage these advances for the good of society. This class will explore the broad, ongoing themes around Computing for Social Good, inclusive of advances in HCI, computer networks, artificial intelligence, and sustainability. We will read about national- and global-scale challenges and more specific subproblems, and relevant technology projects. While we will examine some conventional engineering ethics topics, our aim is much broader: we will start with fundamental social and ecological challenges and then consider what role, if any, technology should play in responding to them. One of our aims will be to differentiate between nice-sounding-but-ineffective tech-for-good solutions and those that have a chance for real impact. As a result, we will take a systems perspective -- to trace root causes and find the right place(s) to make lasting change.

While a working knowledge of critical technology theory is important to doing good work, this is a class for builders and designers. All students will complete a course project and end up with an artifact; potentially a tool (designed and/or built) for solving a real-world problem that they bring to the class or a fictional narrative elucidating the potentials and dangers of new ongoing advances.

This is a graduate-level computer science class but particularly motivated and experienced students (including undergrads) from other disciplines are encouraged to reach out if they'd like to participate.

More information available here:
CSE580 FA2024 Computing for Social Good Syllabus

Grading:

50% Final Project: Projects of 1-3 students that address some pressing social need. All will eventually need to produce an artifact: a program, model, or design for a solution to a problem.

35% Structured Writing and Presentations: There will be a number of short writing and oral presentation exercises throughout the quarter (cumulatively 7-12 pages) varying from short essays practicing ethical argumentation to speculative fiction, where each person must imagine a world where their research or class project leads to both utopian and dystopian outcomes.
Examples of speculative fiction and positional scientific blog posts from a prior year:
https://medium.com/uw-cse-computing-for-social-good-course

10% Reading Writeups: A one-paragraph writeup of *each* reading with what you, as a reader, found interesting about this work. This means you'll post all writeups on our message board here under the thread corresponding to the class date, by 9 am that morning: TBD.
This will be used to give direction to presenters. Late policy: 50% deducted for all late submissions unless permission is granted beforehand.

5% In-class participation (leading discussions on papers).

Final Project:

Initial project ideas (0.5-1 pg) are due (via email to Lisa and me) October 14th. You are strongly encouraged to think about possible project ideas before the start of classes!
1) Who is on your team? (Include any relevant outside community partners or resources.)
2) What is the problem you are trying to solve?
3) What are some existing solutions (lightweight related work)?
4) What is your design/solution?

More detailed project proposals are due October 23rd.
The general format is a 2-4 page paper in academic format (2 column) detailing any updates on your initial proposal:
1) Who is on your team?
2) What is the problem you are trying to solve?
3) What are some existing solutions (related work)?

4) What is your design/solution?
5) What technologies are you leveraging to build your design/solution?
6) How do you plan (or hope) to evaluate your design/solution?
7) A general timeline for tasks over the next two months to the deadline of June 9th.

After the initial proposal stage, Lisa and I will be scheduling meetings to discuss them.

Final Project Presentations:
Your projects are due Friday, December 11th at 11:59PM. Projects will be presented either in class or during a poster session on December 12th.

1. A 6-10 page writeup of the work in two-column CHI format (http://www.sigchi.org/publications/chipubform/sigchi-paper-format-2016/view). This should look very similar to the Computer Science papers you've read throughout the class: Abstract, Introduction, Related Work, Content, Discussion, Conclusion. Those of you from Computer Science will be graded *much* more hardly on formatting; part of the goal of this exercise is to practice paper writing as well.
2. A poster presentation using a standard poster format. Location TBD.

Presentations:

As you make materials for class, please make them accessible: Please see this video on making presentations accessible.

Course Schedule:

Sept 25:
Introductions to the field and to each other. Before the class please come prepared with an example of a technology or technical intervention from any sector (public, NGO, social entrepreneurship, corporate social responsibility, etc.) that you believe to have mainly positive social impacts, and an example of one that you believe to have mainly negative social impacts.
Prior Reading: None

Sept 30: Project Pitch Christopher Jones (EarthRanger)
Reading: https://earthranger.com

Oct 2: (Wicked) Problems
Lecturer: Kurtis Heimerl
Readings: [Comment on 1 and 2]

- Dilemmas in a General Theory of Planning, Rittel and Webber
- Technology and Disempowerment by Aadi Seth- Chapter 3: what is social good (skim)
- Technology is Not the Answer, Toyama (Alternate link here)

Oct 7: Project Pitch Esther Jang (UW)
Readings:

- Paper 1 (unpublished draft): Chapter 3 of Esther's thesis (chapter title: "| Stem | Seattle Community Network": A Model for Grassroots Infrastructuring of a Technical Learning Commons")
    - Proquest-fulltext-ehbj.pdf
- Blog post 1 (skim): Seattle Community Network, 2022
    - https://medium.com/seattle-community-network/seattle-community-network-an-overdue-giant-update-and-another-call-to-action-7ae90ee3c798
- Blog post 2 (skim, unpublished draft): Seattle Community Network, 2024
    - https://docs.google.com/document/d/1-sezFjBmXR29a1L_0URGnWZ0Dr8Ydl6q5HFUA7eZejI/edit?usp=sharing
- Blog post 3 (short): Tracking boats with Meshtastic
    - https://nico.today/tracking-canoes-with-meshtastic/

Oct 9:
Project pitches: What do you want to work on this quarter and why should people join you?
Small breakout groups for project brainstorming
Readings: None
Here are some example project proposals (from the 2021 version of this class) and an example final presentation + writeup (from another related class):
https://drive.google.com/drive/folders/18xneR5KUu_PJTc3JlpA4c4MYI583-kXe?usp=share_link

Oct 14: Theories of social change, “leverage points,” systems thinking.
Lecturer: Kurtis Heimerl
Readings:

- Leverage Points: Places to Intervene in a System, Meadows
- Do Artifacts Have Politics?, Winner

Oct 16: Techno-Optimism
Due: Initial project proposals (submit by email, instructions on Canvas)
Lecturer: Kurtis Heimerl
Readings:

- The Case for Technology in Developing Regions, Brewer et al.
- The Fortune at the Bottom of the Pyramid by C.K. Prahalad and Stuart L. Hart
- **Can you come up with any more modern examples? (eg spectrum of decentralized tech that waffles in the ambiguous space from social good to status quo)**

Oct 21: Accessibility

Lecturer: Emma McDonnell
Readings:

- Interdependence as a Framework for Assistive Technology Research and Design by Bennett et al. https://dl-acm-org.offcampus.lib.washington.edu/doi/10.1145/3234695.3236348
- Short blog post: https://leavingevidence.wordpress.com/2011/02/12/changing-the-framework-disability-justice/
- A resource that could be given to students but is a lot to assign for one class (e.g., Optional): https://www.youtube.com/watch?v=OFS8SpwioZ4&t=2s&ab_channel=Netflix

Oct 23: Activities
Due: Speculative Fiction Stories Round 1 (instructions)
Swap and share of speculative fiction stories. Discussion of readings.
Due: 2-4 pg final project proposals (on Canvas)

Oct 28: Lucille Njoo's (NLP + criminal justice)
Required Readings:

1. How Does NLP Benefit Legal System: A Summary of Legal Artificial Intelligence (Zhong et al. 2020)
2. Smart criminal justice: exploring the use of algorithms in the Swiss criminal justice system (Simmler et al. 2022)

Optional Readings:

- Predicting risk in criminal procedure: actuarial tools, algorithms, AI and judicial decision-making (McKay 2019)
- AI Applications in the Criminal Justice System: The Next Logical Step or Violation of Human Rights (Mohamed Gamil Zakaria, 2023)
- The accuracy, fairness, and limits of predicting recidivism (Julia Dressel and Hany Farid, 2018)

Oct 30: Mohammad Rashidujjaman Rifat
Readings:

- Money, God, and SMS: Explorations in Supporting Social Action Through a Bangladeshi Mosque (CHI '17)
- Cohabitant: The Design, Implementation, and Evaluation of a Virtual Reality Application for Interfaith Learning and Empathy Building (CHI '24)

Bonus Reading:

- Data, Annotation, and Meaning-Making: The Politics of Categorization in Annotating a Dataset of Faith-based Communal Violence (FAccT '24)

Nov 4: Lisa Orii (Public Health)
Required Readings:

- Video: Global Digital Health Forum 2022 Keynote [I recommend watching the whole thing, but if you don't have time please watch from 33:51–]
- Paper: 99DOTS: a low-cost approach to monitoring and improving medication adherence (ICTD 2019)
- Paper: Leveraging Implementation Science in Human-Centered Design for Digital Health (CHI 2024)

Due: 1-2 sentence feedback (email preferred) of how the course is going and whether you would like to see something different.

Nov 6: Activities
Due: Speculative Fiction Stories Round 2 (instructions)
Swap and share of edited or expanded speculative fiction stories.
Reading: None

Nov 11: HOLIDAY - Veteran's Day

Nov 13: No class: CSCW

Nov 18: Tapan Parikh (Marxism)
Readings:

- https://jacobin.com/2018/08/lenin-state-and-revolution-miliband
- https://www.youtube.com/watch?v=h3gwyHNo7MI

Nov 20:
Due: Short oral presentations (2 minutes, in class).

Nov 25: Naveena Karusala (Feminism)
Readings:

- Feminist HCI: Taking Stock and Outlining an Agenda for Design
- Data Feminism for AI

Nov 27: Thanksgiving - No class (A good time to meet to work on your projects)

Dec 2: Felix (Sustainability)
Readings:

- https://arxiv.org/pdf/2011.02839
- https://eprints.lancs.ac.uk/id/eprint/168211/1/Bremer_Knowles_Friday_CHI_2022.pdf

Due: Short blog post analyzing the impact of a real technology or technical intervention on ethical grounds, directed at a lay audience (imagine public policy makers). May use computational or statistical reasoning, publicly available datasets, etc.
Example here from last year!

Dec 4: Limits of Computing, De-Growth, Inevitability
Lecturer: Kurtis Heimerl
Reading:

- Exponential Economist meets Finite Physicist, Murphy 2012
- Information Systems for the Age of Consequences, Silberman 2015
- [Optional] Anti-tech revolution Kaczynski 2015, specifically 1.VI and 2 (I-IV). Coupled with Torres twitter discussion on the "6 month AI pause"
    - See canvas for specific notes on this author, who was an anti-tech terrorist who murdered computer scientists (and others).

Questions:

1) Do you buy the argument that we are going to enter a degrowth-required phase in the nearish future?
2) Do you think collapse is inevitable?

Dec 12 (2:30-4:20PM): Project Presentations
Due: Project Reports