CS 492: Social Implications of Computing: Winter 2024 Syllabus
Sections 001 and 002: Discrimination, Privacy, and Surveillance in Computing

1. Contact information:
   a. Instructors:
   Daniel G. Brown, Ph.D.
   David R. Cheriton School of Computer Science
   Davis Centre 2516
   200 University Avenue West
   Waterloo, ON N2L 3G1
   dan.brown@uwaterloo.ca
   1-519-888-4567, ext. 36278
   Office hours: TBD

   Maura R. Grossman, J.D., Ph.D.
   David R. Cheriton School of Computer Science
   Davis Centre 2501
   200 University Avenue West
   Waterloo, ON N2L 3G1
   maura.grossman@uwaterloo.ca
   1-519-888-4567, ext. 37522 (office)
   1-212-861-8097 (voicemail)
   Office hours: By request; email to schedule a time
   b. Teaching Assistants:
   Lydia Choong
   Joseph Meleshko
   Gaurav Sahv
   Nanda Kishore Sreeivas
2. Course description:
   a. CS 492 as a whole:
   This course considers the impact of computing on individuals, organizations, and society. Students learn how to make informed judgements about the social and ethical consequences of deploying computing technologies and how to foster critical thought and professional responsibility.
   b. This offering of CS 492:
   This course will consider the ways in which computing systems may enable, encourage, or prevent societal discrimination or privacy violations of a variety of types. Students will examine how algorithms and artificial intelligence systems may provide different or harmful outcomes for certain populations, and what legal, technical, and societal interventions can ameliorate harms caused by such algorithms and systems.

3. Course goals:
    a. CS 492 as a whole:
    At the end of the course, students should be able to:
    - Identify important social implications of computerization
    - Describe how to behave ethically as a computer scientist
    - Propose technological and social/policy solutions to current challenges presented by computerization (recommended actions)
    - Combine their opinions with information from existing research in both written and oral formats
    - Collaborate with peers on open-ended topics where there is often no clear, definitive response
    - Formulate clear, constructive feedback on arguments constructed by their peers
    - Identify where their knowledge of computer science provides a valuable contribution to the overall dialogue about the social and ethical implications of computing
    b. This offering of CS 492:
    Our primary goal is for students in technology careers to be able to (i) discuss with colleagues and others the positive or negative discriminatory and privacy consequences of technological innovations, and (ii) explain techniques to remove bias or violations of privacy from data collections, computer algorithms, or artificial intelligence applications, and why they might or might not work in specific circumstances.

    To be specific, our objectives are that at the end of this course, students will be able to:
    - Describe, using historical context and a sociocultural lens, how computing systems can either deliberately or systematically aid and abet discrimination or violations of privacy among human populations;
    - Reason effectively with colleagues and others about the positive or negative discriminatory or privacy consequences of technological innovations;
    - Explain techniques available to reduce bias or violations of privacy in data collections, computer algorithms, or artificial intelligence applications, and why they might or might not work in specific circumstances; and
    - Describe how legal or policy changes at a broad level may or may not improve the situation of discrimination or privacy in specific cases.
4. Course meetings and logistics:
    We will be teaching two sections of CS 492 in Winter 2024:
    - Section 001 will meet from 2:30-5:20 on Tuesdays, face-to-face, in MC 4040.
    - Section 002 will meet fully online, synchronously, from 10:00 am-12:50 pm on Tuesdays, via Zoom.
    - Students must remain in their assigned section.

- In both sections, the third hour of the class meeting will consist of a lab for research and writing assistance or small-group project planning and preparation. The schedule of the labs is on the course webpage. Early in the term, we will focus the labs on research and writing skills; later in the term, they will be for students to work on milestones for the small-group project. Since two hours and fifty minutes is a very long session (and is twenty minutes longer than three traditional fifty-minute class meetings), we will often end early; we'll also skip some weeks.

Class discussion will comprise a significant component of the course, so attendance at all class sessions is **required** unless absences are excused, in advance, by the instructors. An excessive number of absences will impact the participation component of a student's grade. Please do not attend the in-person class in person if you are ill and should be in self-isolation; just let the instructors know you are ill and unable to attend class. Class sessions will not be recorded.

There is a Slack channel for discussions in this course, where topics for essays, announcements, and other information will be shared: TBD

5. From the news:

Most weeks, CS 492 will start with a "from the news" segment featuring a relevant article, podcase, or video from recent news. We will supply you with the article, podcast, or video (which will be short) no later than the Friday before the course meeting. You will find it on the "from-the-news" channel on the course Slack, or on the course webpage.

Please submit articles, podcasts, or videos for us to consider for the "from-the-news" segment: post them in the "from-the-news" channel on the course Slack by Wednesday evening the week before the class you want to discuss the article, podcast, or video , so that your instructors have time to review it. Tell us why you think it would be a good choice. Submitting articles, podcasts, or videos in this way will count towards the it "participation" component of the course grade. If we select your from-the-news submission in a week, we will give you a 1% bonus mark towards your final grade in the course.

6. Course readings:

There will be no textbook for this course. All course materials are attached as links to this course syllabus, are freely available online, or (if subject to copyright protection) are available to students registered for this course via Slack or the LEARN link for the course, https://learn.uwaterloo.ca/d2l/home/869391

7. Course evaluation and grading:

Evaluation in this course will include three components:

   a. Writing assignments: 30%
      - There will be weekly writing assignments, which will consist of either commentaries on the readings or position papers (i.e., thought pieces). There will be around nine such commentaries assigned; only the top six scores will count towards a student's grade. Students may submit as many of the assignments as they wish. Students will receive regular, written feedback on their papers from one of the teaching assistants.

The prompt for the weekly commentary or position paper will be provided each week at the end of class, and will also be posted online in the Slack channel. The response will be due every week on **Monday at 11:59 PM via the Dropbox connected to the course via LEARN**, in either .doc/.docx format or as a PDF.

- The six (6) best commentaries or position papers submitted by a student will each count for 5% of the student's final grade. Therefore, the written component of the course will account for a total of 30% of a student's final grade. Should a student wish, they may submit any commentary or position paper to an instructor by email, in an editable word-processing format (i.e., .doc or .docx) for additional feedback (beyond that received from the teaching assistant), particularly with respect to improving their writing style.
- The University of Waterloo's Writing and Communication Centre (WCC) works across all faculties to help students clarify their ideas, develop their voices, and write in the styles appropriate to their disciplines. Centre staff offer one-on-one support in planning assignments and presentation, using and documenting research, organizing and structuring papers, and revising for clarity and coherence. We particularly encourage using the WCC for students whose English or writing skills are not at the level where they wish them to be. Staff from the WCC will offer a lab on how to create a thesis statement and develop arguments around it as one of the earliest third-hour meetings for CS 492.
- Your weekly writing assignments should be approximately two pages (1000 words) long.
- These assignments will be marked on a scale from zero to five.
- We have provided some examples of strong essays from previous offerings of this course and related courses on the LEARN page for this course, and a rubric that offers advice on what makes a strong essay for the course.
- A note on the use of generative AI systems: While you may use these systems to improve the quality of your writing, but you may not use them to create your arguments. For example, you may not supply the weekly prompt to a generative AI system, but you can draft your essay and ask a generative AI system to assist you in improving it. If you do use these systems, **you must inform us that you have done so, and how you have used it**. If you cannot fully explain the arguments in your own essay, and how you came up with them, you have misused these generative AI systems, and you should start your essay again. In other words, all ideas should be your own; you may obtain assistance in expressing your ideas, particularly if communicating in English is challenging for you.

b. Class participation: 20%
- We will assess students' participation based on thoughtfulness and quality, rather than on quantity. What we are looking for is for students who can demonstrate meaningful engagement with the material, justify their arguments, and respond respectfully to contrary positions presented by others. During the course of the semester, students are likely to be asked to advance or defend (either orally or in writing or both) positions that may differ from their own personal views.
- Suggesting articles, podcasts, or videos for the "from-the-news" component of the class will count towards a student's class participation grade, as will contributing meaningfully to discussions in the course Slack channel.
- Students for whom English communication is challenging may need to work especially hard for this component of the course. Participation in the Slack channel or the Zoom chat thread (for the online version of the course) are particularly encouraged in these cases. Please let us know how we can help you participate if English is not your first language or you are introverted (for example, would you like us to call on you?)

c. Small-Group project: 50%
- There will be a small-group project due at the end of the term that will involve a small team comprised between two and four students. Each team will submit a joint work product that may consist of a creative project, such as the development of an online program or tool, an application, a chatbot, a game, a website, a video presentation, or , if you must, a podcast.
- We urge you not to do a podcast for this project unless you have something novel to say or a particularly unique style to present the topic; it is too easy to just make a chatty conversation with not much content, which will not garner a good grade. If you do a podcast, please focus on a small number of topics, find articles to discuss that are not in the course readings, keep a tight thematic focus, and find a very creative way to present the material.
- The small-group projects will involve a technological issue of the sort addressed in the course, regarding a computing topic that connects to discrimination, privacy, and/or surveillance and how they connect to computing. Teams will identify their topic, confirm the appropriateness of the topic with the instructors, divide the labour among their team members, and accommodate different perspectives, viewpoints, and expertise of the team members.
- If students encounter undue challenges in the small-group project work, they should contact the teaching assistants or instructors promptly; in particular, please do not wait until the week before the

project is due to indicate that group members have been unresponsive to their assignments.

- Students may, but are not required, to prepare a short presentation to give in the final class of the semester. For students who choose to present, this will contribute to their class participation grade.
- The project submission has three milestones:
    1. <u>Milestone #1</u>: A one-page project proposal, identifying your group membership, providing the topic under consideration, and the form of your project with as much detail or specificity as possible. Tell us why the topic is interesting, why it is relevant to this course, and how you will explore this topic in your project. This milestone will be worth 5% of the final grade and is **due on February 16 at 11:59 PM by email to the course instructors**. The course instructors will mark these proposals largely to confirm their suitability as small-group projects and that the described scope is consistent with the goals and objectives of the course project and to satisfy the grade requirement.
    2. <u>Milestone #2</u>: A three-page project milestone, **due on March 15 at 11:59 PM** by email to the course instructors. In this milestone, students will provide a progress report: what are the goals of the project, what questions are the team trying to answer, why is the form of the project appropriate to answer those questions, what research has the team undertaken this far, and what has the team has learned thus far. If any problems or challenges have been encountered, they should be raised in this milestone. A key component of this milestone is to describe the current research the group has done, how they have identified appropriate sources, and what challenges exist with finding good data and content for the project. This milestone will be worth 15% of the final grade. The Course instructors will mark these proposals to identify the level of seriousness of the research and to identify gaps or deficits in the project proposal, including around the research itself or its suitability to the course.
    3. <u>Milestone #3</u>: The final submission for the small-group project, which is **due on April 8 at 11:59 PM**. This will be worth 30% of the final grade. This milestone has three parts:
        a. A one-page description of the project, including the group members' names, what question was being addressed, what form the project took, and a summary of the findings. This may also include a link to code repositories, or other specific items you want to have considered in your mark.
        b. A five-minute video tour of the project and its findings. This should focus on results and demonstrating any system

built. For a podcast project, identify the articles you discussed, how you found them, and the technology you used in the preparation of the podcast.

    c. The actual project: a usable website, a finished podcast, a functional chatbot, a playable game, or whatever the final form of the project takes.

All three components should be submitted in one file via the course's LEARN dropbox, no later than the due date. There will be no extensions for late projects; we need to submit course grades on time!

This course has neither a midterm nor a final examination.

8. Rules for small-group work:

The project should consist solely of work done by your team members: in particular, nothing you submit for marking should be the work of anyone else. You may submit other people's work that has served as inspiration for your work, or that your project seeks to critique. The one exception to this rule is that you may use existing libraries or code bases, with proper acknowledgment to the original author(s); that said, the main intellectual contribution of your small-group project must be your own.

For the weekly commentaries or position papers, they must be entirely your own writing (see above concerning the use of generative AI systems); you may discuss your thoughts with your classmates through the lectures and in your own conversations outside of class, whether on Slack or otherwise. A good rule of thumb is that if the instructors were to pull you aside and ask you to explain the arguments underlying your writing, you should be able to explain what you mean by every sentence; if not, you don't understand your own work, which suggests that it is not sufficiently your own. If you have questions about this, please ask your teaching assistants or instructors for further guidance.

9. Mark appeals:

Should any student wish to discuss the written feedback or their mark on an individual commentary or position paper, that student should first reach out to the teaching assistant who provided the feedback or mark by email to schedule a time to discuss the comments or mark. Should the student continue to be dissatisfied with the feedback or mark provided by the teaching assistant, they should reach out to the instructors by email to schedule a time to discuss their concerns. This should be rare since grades can easily be improved by submitting an additional written assignment. Formal appeals may result in assignment of the same grade, a higher grade, or a lower grade than the previous grade awarded by the teaching assistant.

10. Course website:

The readings for CS 492 Sec. 001 and 002 will be available via this link: https://cs.uwaterloo.ca/~browndg/492W24/index.shtml; this link also includes this syllabus, and other materials.

11. Land acknowledgment:

The University of Waterloo is located on the traditional territory of the Anishinaabeg, Neutral, and Haudenosaunee people. The main campus is located on the Haldimand

Tract, which was granted to the Six Nations after the American Revolution. This tract includes six miles of land on either side of the Grand River. Both instructors are non-Indigenous settlers who came to this country to teach and do research, and we are committed to incorporating Indigenous content into my teaching work. At the University of Waterloo, active work toward reconciliation takes a number of forms and is centralized within the Office of Indigenous Relations.

12. COVID continuity plan:
    If the university alters the delivery structure for courses, we will respond as follows:
    For cancellation of in-person classes, we will switch to Zoom-based instruction. Students will be made aware of such arrangements via the Slack site for the course.
    If one instructor takes ill, courses will be delivered by the other instructor; if both of us take ill, some classes may need to be delivered by teaching assistants, or via the course being taken fully online during the instructors' isolation period.
    No specific accommodation will be made for students in self-isolation; they can connect with the instructors during office hours or by appointment and can obtain the weekly essay topic via Slack.
    The course has neither a midterm nor a final.

13. Waterloo policies:
    a. Academic Integrity
       In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect, and responsibility. [Check the Office of Academic Integrity for more information.]
    b. Grievance
       A student who believes that a decision affecting some aspect of their university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.
    c. Discipline
       A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for their actions. [Check the Office of Academic Integrity for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (*e.g.*, plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course teaching assistants, course instructors, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline. For typical penalties, check Guidelines for the Assessment of Penalties.
    d. Appeals
       A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes they have a ground for an appeal should refer to Policy 72, Student Appeals.

e. Note for Students with Disabilities
AccessAbility Services, located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term. Please do not wait until the end of the term to advise us you need an accommodation; it is very challenging for us to respond to needs for accommodation late in the term.

f. Mental Health
If you or anyone you know experiences severe academic stress, difficult life events, or feelings of severe anxiety or depression, we strongly encourage you to seek support.
On campus resources include:
- Campus Wellness at https://uwaterloo.ca/campus-wellness/
- Counseling Services at counselling services@uwaterloo.ca / 1-519-888-4567, ext. 32655 / Needles Hall 2nd Floor (NH 2401)
- MATES one-to-one peer support program offered by WUSA and Counselling Services at mates@uwaterloo.ca
- Health Services located across the creek from the Student Life Center (SLC) / 519-888-4096

Off campus resources include:
- Good2Talk (24/7) free confidential helpline for post-secondary students at 1-866-925-5454
- Here 24/7 Mental Health and Crisis Service Team at 1-844-437-3247
- OK2BME support services for gay, lesbian, bisexual, transgender, or those questioning their sexual or gender identity at 1-519-884-0000, ext. 213
- EMPOWER ME 1-833-628-5589 for Canada / U.S.A. / Other countries http://studentcare.ca/rte/en/IHaveAPlan_WUSA_EmpowerMe_EmpowerMe
  EMPOWER ME in China: China North 108007142831;
  China South 108001402851

g. Diversity
It is the Faculty of Mathematics' intention that students from diverse backgrounds and perspectives be well served in its courses, and that students' learning needs be addressed both in and out of the classroom. We recognize the immense value of diversity in identities, perspectives, and contributions that students bring, and the benefit it has on the educational environment. Your suggestions are encouraged and appreciated. Please let your instructors and teaching assistants know if there are ways to improve the effectiveness of this course for you personally, or for other students or student groups. In particular:
- We will gladly honour your request to address you by an alternate/preferred name or gender pronoun. Please advise us of this preference early in the semester so that we may make appropriate changes to our records;

- We will honour your religious holidays and celebrations. Please inform us of those at the start of the semester; and
- We will follow AccessAbility Services guidelines and protocols on how best to support students with different learning needs. **Please do not wait until the end of the term to advise us that you need an accommodation; it is very challenging for us to respond to needs for accommodation late in the term. You must alert us to the need early in the terms so we can come up with an accommodation that is reasonable and fair.**

h. Intellectual Property**:** Students should be aware that this course contains the intellectual property of their instructors, TAs, and/or the University of Waterloo. Intellectual property includes items such as:
- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructors or TAs or used by the instructors or TAs with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructors, TAs and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructors, TAs or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructors if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).