

# COMP 301 001 Sp19

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## COMP 301: Ethics and Accountability in Computer Science

Spring 2019

Tuesdays and Thursdays, 9:25 am - 10:40 am in Duncan Hall 1046

Co-instructors:

Tina L. Peterson, Ph.D. ([tina.peterson@rice.edu](mailto:tina.peterson@rice.edu) (<mailto:tina.peterson@rice.edu>)); office hours  
Wednesdays 3 pm - 4 pm or by appointment in Mech Lab 106

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3057

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or by appointment in Duncan 3062

### COURSE DESCRIPTION

Computer scientists have a great deal of power in the twenty-first century; they have duties both to society and their own profession to wield that power wisely and responsibly. In this discussion- and reflection-oriented course students will master fundamentals of moral philosophy and principles of social responsibility; they will apply these modes of reflection and reasoning to current issues in computer science. These include but are not limited to algorithmic fairness and decision-making; surveillance and privacy; biased data and machine-learning outcomes; autonomous systems and human casualties; and diversity and inclusion in the tech industry.

### LEARNING OBJECTIVES

During this course students will:

- Develop an understanding of major schools of thought in moral philosophy
- Master principles of social responsibility related to technology
- Apply ethical decision-making models to case studies
- Develop an awareness of potential consequences of their decisions as computer science professionals

### COURSE MATERIALS

All readings are linked to in the course schedule. No textbook purchase is required. The instructors will do everything in their power to give students access to articles and other media free of paywall obstacles; any problems accessing the readings should be reported to the instructors via e-mail well ahead of the class meeting for which the reading is due.

## ONLINE FORUM POSTS

Articles, other materials and discussion prompts will be posted to the class's Canvas on a regular basis. Students will be expected to post a minimum of 5 one-paragraph critical responses and 10 short but meaningful replies to others' posts to the forum over the course of the semester. Points will be awarded based on eloquence and quality of critical thought.

## DEVICES IN CLASS

As this course is based on discussion and reflection, laptop, tablet, and smartphone use will NOT be allowed in class as it is potentially distracting to both the user and those sitting around her/him. Research has shown that non-academic laptop use in class is inversely correlated with class performance, and that taking hand-written notes encourages deeper processing of information.

## ACCOMMODATIONS FOR DISABILITY

Students who require accommodation for a documented disability should speak with one of the instructors during the first week of class.

## ASSESSMENT

This course is based on discussion and reflection, and opinions and perspectives may vary widely. Students will not be assessed (awarded points) based on whether their expressed perspective or analysis agrees with those of the instructors, but on how eloquently, thoughtfully and critically they answer questions posed, and how well they support their positions with high-quality evidence. They will also be assessed on the quality of writing in assigned papers. The point breakdown will be as follows:

Midterm exam	100
Group presentation on machine learning project	50
5 x 1-paragraph online forum posts	30
10 x thoughtful comments on others' forum posts	30
6 x reading quizzes	30
First draft of response paper to "Black Mirror" episode	25

Final draft of response paper to “Black Mirror” episode	25
One-page critical response to Dr. Vardi’s talk	10
<b>Maximum possible points:</b>	<b>300</b>

## CALCULATION OF FINAL GRADES

Point totals will be converted into percentages, and final grades will be awarded as follows.

A+    100 – 96.0	B+    89.9 – 86.0	C+    79.9 – 76.0	D+    69.9 – 66.0
A      95.9 – 93.0	B      85.9 – 83.0	C      75.9 – 73.0	D      65.9 – 63.0
A-     92.9 – 90.0	B-     82.9 – 80.0	C-     72.9 – 70.0	D-     62.9 – 60.0

## ATTENDANCE

Students will be expected to attend all class meetings and participate in class discussions in person and online. An attendance sheet will be passed around and collected within the first 10 minutes of each class meeting, and students’ signatures on this sheet shall serve as the only record of their presence. Excused absences must be cleared with instructors in advance. Any more than two unexcused absences will affect students’ point totals as shown below.

2 absences	no penalty
3 to 4 absences	- 20 points
5 to 6 absences	- 40 points
7 or more absences	failing grade for course

## COURSE SCHEDULE AND REQUIRED READING (*subject to revision*)

All readings should be done in advance of the class for which they are listed. Quizzes on the readings will be given randomly at the start of eight classes throughout the semester; each student’s lowest two quiz grades will be dropped.

8 Jan            In-class brainstorm activity: what powers do computer scientists have?

Review syllabus and expectations for course

The trolley problem and abstracted power

10 Jan Lecture by Dr. Vardi: "An Ethical Crisis in Computing"  
Assigned: One-page critical response to Dr. Vardi's talk.

15 Jan Human nature + computers = ?

Reading:

[Parker \(2012\). "The Story of a Suicide." The New Yorker.](https://www.newyorker.com/magazine/2012/02/06/the-story-of-a-suicide)

<https://www.newyorker.com/magazine/2012/02/06/the-story-of-a-suicide>

Due via Canvas by 9 am: One-page critical response to Dr. Vardi's talk.

**17 Jan** Tech and utopia vs. dystopia

**UPDATED**

Readings:

[Barlow \(1996\). A Declaration of the Independence of Cyberspace. EFF.org](https://www.eff.org/cyberspace-independence)

<https://www.eff.org/cyberspace-independence>

[SparkNotes. Lord of the Flies \(1954\) by William Golding.](https://www.sparknotes.com/lit/flies/)

<https://www.sparknotes.com/lit/flies/>

22 & 24 Jan Code as law

Respect for human rights

Machine learning and algorithmic fairness in criminal justice

Transparency, accountability, and explainability

Readings:

[Angwin et al. \(2016\). "Machine Bias." ProPublica \(https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing\)](https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing).

[Diakopoulos & Friedler \(2016\). "How to Hold Algorithms Accountable." MIT Technology Review. \(https://www.technologyreview.com/s/602933/how-to-hold-algorithms-accountable/\)](https://www.technologyreview.com/s/602933/how-to-hold-algorithms-accountable/)

29 Jan Machine learning and algorithmic fairness in employment decisions

Reading:

[Mann and O'Neil \(2016\). "Hiring algorithms are not neutral." Harvard Business Review. \(https://hbr.org/2016/12/hiring-algorithms-are-not-neutral\)](https://hbr.org/2016/12/hiring-algorithms-are-not-neutral/)

31 Jan Moral philosophy: Rawls' Theory of Justice

UPDATED Machine learning and algorithmic fairness in health care

Readings:

[Char, Shah, and Magnus \(2018\). "Implementing Machine Learning in Health Care — Addressing Ethical Challenges." New England Journal of Medicine. \(https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5962261/\)](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5962261/)

[Gianfrancesco et al \(2018\). "Potential Biases in Machine Learning Algorithms Using Electronic Health Record Data." JAMA Internal Medicine. !\[\]\(bd3b31712ad9bab5a241210fa6925cdd\_img.jpg\)](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5962261/)

5 Feb Present solutions to missing-data problem in organ

UPDATED transplant ML system

Gentrification and the tech industry

Readings:

[Newitz \(2017\). "A startup aims to stop gentrification, with help from the tech industry." arstechnica. \(https://arstechnica.com/tech-policy/2017/08/silicon-valley-can-help-fix-the-bay-areas-inequality-crisis/\)](https://arstechnica.com/tech-policy/2017/08/silicon-valley-can-help-fix-the-bay-areas-inequality-crisis/)

7 Feb NO CLASS (spring recess)

12 Feb "Move fast and break things" vs. duties and obligations of computing professionals

UPDATED

Readings:

[The ACM Code of Ethics \(draft 3, 2018\) \(https://ethics.acm.org/2018-code-draft-3/\)](https://ethics.acm.org/2018-code-draft-3/)

[Hill \(2017\). "The ethical problem of software neglect." Blog@CACM. \(https://cacm.acm.org/blogs/blog-cacm/218185-the-ethical-problem-of-software-neglect/fulltext\)](https://cacm.acm.org/blogs/blog-cacm/218185-the-ethical-problem-of-software-neglect/fulltext)

14 Feb Deliberate law-breaking via software

Readings:

[Isaac \(2017\). "How Uber Deceives the Authorities Worldwide." The New York Times \(https://www.nytimes.com/2017/03/03/technology/uber-greyball-program-evade-authorities.html\).](https://www.nytimes.com/2017/03/03/technology/uber-greyball-program-evade-authorities.html)

[Neate \(2015\). "Volkswagen under investigation over illegal software that masks emissions." \(https://www.theguardian.com/business/2015/sep/18/epa-california-investigate-volkswagen-clean-air-violations\) The Guardian \(https://www.theguardian.com/business/2015/sep/18/epa-california-investigate-volkswagen-clean-air-violations\).](https://www.theguardian.com/business/2015/sep/18/epa-california-investigate-volkswagen-clean-air-violations)

19 & 21 Feb Surveillance and privacy

Reading:

[Lynch \(2015\). “The philosophy of privacy: why surveillance reduces us to objects.” The Guardian.](https://www.theguardian.com/technology/2015/may/07/surveillance-privacy-philosophy-data-internet-things)

[\(https://www.theguardian.com/technology/2015/may/07/surveillance-privacy-philosophy-data-internet-things\)](https://www.theguardian.com/technology/2015/may/07/surveillance-privacy-philosophy-data-internet-things)

26 Feb Addictive apps, filter bubbles, and alienation

Reading/viewing:

[Coca \(2016\). “Why your favorite apps are designed to addict you.” The Kernel.](https://kernelmag.dailydot.com/issue-sections/features-issue-sections/15708/addicting-apps-mobile-technology-health/)  
[\(https://kernelmag.dailydot.com/issue-sections/features-issue-sections/15708/addicting-apps-mobile-technology-health/\)](https://kernelmag.dailydot.com/issue-sections/features-issue-sections/15708/addicting-apps-mobile-technology-health/)

[Pariser \(2011\). “Beware online ‘filter bubbles.’” TED talk.](https://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles)  
[\(https://www.ted.com/talks/eli\\_pariser\\_beware\\_online\\_filter\\_bubbles\)](https://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles)

28 Feb Midterm exam

5 & 7 Mar Autonomous systems and human casualties

Readings:

[Liu \(2017\). “Irresponsibilities, inequalities and injustice for autonomous vehicles.” \*Ethics and Information Technology\* 19\(3\) p 193–207](https://link.springer.com/article/10.1007/s10676-017-9436-2)  
[\(https://link.springer.com/article/10.1007/s10676-017-9436-2\)](https://link.springer.com/article/10.1007/s10676-017-9436-2).

[Shariff et al. \(2016\). “Whose Life Should Your Car Save?” New York Times.](https://www.nytimes.com/2016/11/06/opinion/sunday/whose-life-should-your-car-save.html)  
[\(https://www.nytimes.com/2016/11/06/opinion/sunday/whose-life-should-your-car-save.html\)](https://www.nytimes.com/2016/11/06/opinion/sunday/whose-life-should-your-car-save.html)

Assigned: Critical response paper to “Black Mirror” episode.

12 & 14 Mar NO CLASS (spring break)

19 Mar Moral philosophy: Kant's Categorical Imperative  
Targeted advertising and users as commodities

Reading:

[Hern \(2018\). "Cambridge Analytica: how did it turn clicks into votes?" The Guardian. \(https://www.theguardian.com/news/2018/may/06/cambridge-analytica-how-turn-clicks-into-votes-christopher-wylie\)](https://www.theguardian.com/news/2018/may/06/cambridge-analytica-how-turn-clicks-into-votes-christopher-wylie)

21 Mar Ownership of data and models derived from human behavior

Reading:

[Hill \(2017\). "Facebook Figured Out My Family Secrets, And It Won't Tell Me How." Gizmodo. \(https://gizmodo.com/facebook-figured-out-my-family-secrets-and-it-wont-tel-1797696163\)](https://gizmodo.com/facebook-figured-out-my-family-secrets-and-it-wont-tel-1797696163)

Due on Canvas by 9 am: First draft of response paper to "Black Mirror" episode.

26 & 28 Mar Diversity and inclusion in the tech industry

Readings:

[Myers \(2018\). "Women and Minorities in Tech, by the Numbers." Wired. \(https://www.wired.com/story/computer-science-graduates-diversity/\)](https://www.wired.com/story/computer-science-graduates-diversity/)

[Vardi \(2018\). "How We Lost the Women in Computing." Communications of the ACM. \(https://cacm.acm.org/magazines/2018/5/227192-how-we-lost-the-women-in-computing/fulltext\)](https://cacm.acm.org/magazines/2018/5/227192-how-we-lost-the-women-in-computing/fulltext)

[Mundy \(2016\). "Why is Silicon Valley So Awful to Women?" The Atlantic. \(https://www.theatlantic.com/magazine/archive/2017/04/why-is-silicon-valley-so-awful-to-women/517788/\)](https://www.theatlantic.com/magazine/archive/2017/04/why-is-silicon-valley-so-awful-to-women/517788/)

Assigned: Ethical machine learning projects

2 & 4 Apr Civic institutions, social media accountability, and democracy

Readings:

[Tiku \(2017\). "How Russia 'pushed our buttons' with fake online ads." Wired. \(https://www.wired.com/story/how-russia-pushed-our-buttons-with-fake-online-ads/\)](https://www.wired.com/story/how-russia-pushed-our-buttons-with-fake-online-ads/)

[Leetaru \(2018\). "Without Transparency, Democracy Dies In The Darkness Of Social Media." Forbes. \(https://www.forbes.com/sites/kalevleetaru/2018/01/25/without-transparency-democracy-dies-in-the-darkness-of-social-media/#19612d677221\)](https://www.forbes.com/sites/kalevleetaru/2018/01/25/without-transparency-democracy-dies-in-the-darkness-of-social-media/#19612d677221)

9 & 11 Apr The human consequences of the robot economy and the humans-as-robots economy

Readings:

[Vardi \(2016\). "Are robots taking our jobs?" The Conversation \(https://theconversation.com/are-robots-taking-our-jobs-56537\).](https://theconversation.com/are-robots-taking-our-jobs-56537)

[The Economist \(2016\). "Automation and anxiety." \(https://www.economist.com/special-report/2016/06/25/automation-and-anxiety\)](https://www.economist.com/special-report/2016/06/25/automation-and-anxiety)

[Scheiber \(2017\). "How Uber Uses Psychological Tricks to Push Its Drivers' Buttons." New York Times. \(https://www.nytimes.com/interactive/2017/04/02/technology/uber-drivers-psychological-tricks.html\)](https://www.nytimes.com/interactive/2017/04/02/technology/uber-drivers-psychological-tricks.html)

Due: Final draft of response paper to "Black Mirror" episode.

16 & 18 Apr Group presentations of ethical machine learning projects

Re-visit first week brainstorm: what powers do computer scientists have?

## Course Summary:

Date	Details	
Tue Jan 15, 2019	 <a href="https://canvas.rice.edu/courses/20367/assignments/100768">One-page response paper to Dr. Vardi's Jan 10 lecture (https://canvas.rice.edu/courses/20367/assignments/100768)</a>	due by 9am
	 <a href="https://canvas.rice.edu/courses/20367/assignments/101600">Reading quiz 1 (https://canvas.rice.edu/courses/20367/assignments/101600)</a>	due by 9:35am
Tue Jan 22, 2019	 <a href="https://canvas.rice.edu/courses/20367/assignments/102470">Reading quiz 2 (https://canvas.rice.edu/courses/20367/assignments/102470)</a>	due by 9:35am
Thu Jan 31, 2019	 <a href="https://canvas.rice.edu/courses/20367/assignments/103994">Reading quiz 3 (https://canvas.rice.edu/courses/20367/assignments/103994)</a>	due by 11:59pm
	 <a href="https://canvas.rice.edu/courses/20367/assignments/100951">Roll Call Attendance (https://canvas.rice.edu/courses/20367/assignments/100951)</a>	