CS 182: Ethics, Public Policy, and Technological Change

Rob Reich
Mehran Sahami
Jeremy Weinstein
Ece Korkmaz (Co-Head TA)
Alena Smith (Co-Head TA)
Today’s Agenda

1. Why we are teaching this course
2. Why are you interested in taking it?
3. Why you *should* take this course
4. What we are going to do together this quarter
Mehran Sahami

- Professor (Teaching) of Computer Science
- Chair, Computer Science Department
- Spent a decade in tech industry before returning to Stanford
When I worked in industry, I saw two things first hand:

- Many decisions with social consequences result from decisions made in code
  - Rankings of search engine results
  - Recommendations in a social network
  - Objective functions to optimize in machine learning algorithms

- Often, social consequences of these decisions are not considered (or even identified) when the code is written
  - We don’t realize the full implications of our work (e.g., perpetuating biases, creating anti-social behavior, etc.)
  - We only deal with consequences after a problem is spotlighted (e.g., Cambridge Analytica scandal, creation of echo chambers, etc.)
The “New” Physicists

• After the Manhattan Project, many physicists realized the broader impact of their technical work
  • Some became peace activists

• Some have likened the computer scientists of today to the physicists of the mid-20th century

• In both cases, developing more technology does not provide a complete solution
  • Need to understand the interplay of technology, public policy, and societal impact

Top Image Source: Charles Levy.
Unexpected Consequences

- “Waymo Collision Illustrates Why Society Might Eventually Ban Human Driving”
  - Forbes, Nov. 7, 2018

- “Wielding Rocks and Knives, Arizonans Attack Self-Driving Cars”
  - New York Times, Dec. 31, 2018
“Revelations brought to light from whistleblower Frances Haugen, a former data scientist at Facebook, has led to what may be the most threatening scandal in the company's history.

... Haugen told Congress that Facebook consistently chose to maximize its growth rather than implement safeguards on its platforms...”

Source: Bobby Allyn, NPR.org, Oct. 5, 2021
Being Well-Intentioned is Not Enough

Enter Galactica, an LLM aimed at writing scientific literature. Its authors trained Galactica on "a large and curated corpus of humanity’s scientific knowledge," including over 48 million papers, textbooks and lecture notes, scientific websites, and encyclopedias.

“Colleges are turning students’ phones into surveillance machines, tracking the locations of hundreds of thousands”
- Washington Post, Dec. 24, 2019

“School and company officials call location monitoring a powerful booster for student success: If they know more about where students are going, they argue, they can intervene before problems arise. But some schools go even further, using systems that calculate personalized ‘risk scores’ based on factors such as whether the student is going to the library enough.

... The students who deviate from those day-to-day campus rhythms are flagged for anomalies, and the company then alerts school officials in case they want to pursue real-world intervention.”
Google and Apple jointly created the Exposure Notifications System out of a shared sense of responsibility to help governments and our global community fight this pandemic through contact tracing.

"Your phone and the phones around you will work in the background to exchange these privacy-preserving random IDs via Bluetooth. You do not need to have the app open for this process to take place."

"The Exposure Notifications System does not collect or use the location from your device."

Source: https://www.google.com/covid19/exposurenotifications/
Rob Reich

- Professor of Political Science
- Director, Center for Ethics and Society
- Co-Director, Center for Philanthropy and Civil Society
- Associate Director, Institute for Human-Centered Artificial Intelligence
My Motivation(s)

- Computer Science and Silicon Valley >> the new management consulting and Wall Street. Why?
- Ethical ambition
- Stanford says it trains future leaders. Does it? What does 21st Century leadership require?
“The Goliath of totalitarianism will be brought down by the David of the microchip.”

U.S. President Ronald Reagan, 1981-1989
Imagine if the Internet took hold in China. Imagine how freedom would spread.

U.S. President George Bush, 1989-1993

“Imagine if the Internet took hold in China. Imagine how freedom would spread.”
Why Technology Favors Tyranny

Artificial intelligence could erase many practical advantages of democracy, and erode the ideals of liberty and equality. It will further concentrate power among a small elite if we don’t take steps to stop it.

Source: The Atlantic Monthly
Is Big Tech Rotten?

“Ms. Brown said a lot of students criticize Facebook and talk about how they would not work there, but ultimately join. “Everyone cares about ethics in tech before they get a contract,” she said.”
What Can We Learn from the Downfall of Theranos?

The health company's plummet carries valuable lessons for Silicon Valley.

December 17, 2018 | by Sachin Walkar

Theranos founder Elizabeth Holmes epitomized Steve Jobs, which attracted Silicon Valley investors who didn't look too closely at the health company's claims, says John Carreyrou, the Wall Street Journal reporter who investigated Theranos. | Reuters/Brendan McDermid

One of the most epic failures in corporate governance in the annals of American capitalism.
you said a lot of stuff about how you wanted to make regulations, just good ones - was that pretty much just PR too?

there's no one really out there making sure good things happen and bad things don't

usually there's only one toggle--do more or do less

yeah just PR

fuck regulators

ey make everything worse

they don't protect customers at all
We cannot know his legendary head with eyes like ripening fruit. And yet his torso is still suffused with brilliance from inside, like a lamp, in which his gaze, now turned to low, gleams in all its power. Otherwise the curved breast could not dazzle you so, nor could a smile run through the placid hips and thighs to that dark center where procreation flared.

Otherwise this stone would seem defaced beneath the translucent cascade of the shoulders and would not glisten like a wild beast's fur: would not, from all the borders of itself, burst like a star: for here there is no place that does not see you. You must change your life.

Rainer Marie Rilke, 1908
Jeremy Weinstein

- Professor of Political Science
- Senior Fellow, FSI and SIEPR
- Director, Stanford Impact Labs
My Motivation

When I served in government, I was struck by two things:

• There is an enormous gulf between those who understand technology and those who have a responsibility for governing a society transformed by technology

• Debates around the governance of new technologies inevitably surface competing values, but we rarely make these values explicit and think about how to balance or choose among them
North Korea Cyberattack on Sony

November 24, 2014: Demands that Sony withdraws its film, The Interview

Policy and cyber experts come together to deliberate on a response.

Image Source, Left: Columbia Records. Right: Reuters
North Korea Cyberattack on Sony

Challenge 1: Understanding what had happened

Challenge 2: Figuring out how to respond

December 2015 terrorist attack in San Bernardino kills 14 people

FBI seeks access to shooter’s iPhone, Apple refuses to unlock the phone
FBI-Apple Encryption Dispute

U.S. Magistrate Judge rules that Apple must write software to unlock the phone, Apple refuses, and FBI eventually unlocks with help of a third party.

Debate continues about whether technology should include a “backdoor” for law enforcement.

Image Source, Left: Bloomberg News/ George Frey. Right: Israeli21C
Now Technology Policy = Foreign Policy

Tensions between the U.S. and Europe around technology policy were a top priority for the Biden Administration post-election.

Strong bipartisan support for a major investment in R&D to counter the rise of China.

Technology Policy = Domestic Policy

A new generation of industrial policy and efforts to thwart anti-competitive behavior

Infrastructure investments in rural broadband

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Your Motivation

Why are you interested in taking this class?

- Think about a moment when you saw/experienced/learned about/anticipated the impacts of a new technology that gave you pause about the costs to society of this technological change.
  - What was the technology?
  - What were your concerns?
  - Do these concerns outweigh the benefits? Why?

- Type up one paragraph sharing your thoughts and submit it now. There is a form to submit your write-up on the class website: https://web.stanford.edu/class/cs182/
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We are experiencing the societal consequences of many new technologies
These consequences are raising critical questions about how these technologies are designed, and whether and how new technologies should be governed and by whom
You have a role to play in answering these questions – as an engineer, a corporate executive, a policymaker, a citizen, or simply a user
Technology has been an engine of growth for the United States
The wages of scale
US households, average wage income
Cumulative % change since 1980
- Top 1%
- Fourth quintile
- Middle quintile
- Second quintile
- Lowest quintile

More in their pockets
Change in income shares and top tax rates
1960-64 to 2005-09, percentage points

Sources: Congressional Budget Office; The Economist

Source: “Inequality” by Anthony Atkinson

Economist.com
Facebook’s Struggles

“Making the world more open and connected”
-- Facebook mission statement until revision in 2017

Protecting Your Information
We understand the importance of keeping your data safe.

We have banned the app "This Is Your Digital Life," which one of your friends used Facebook to log into. We did this because the app may have misused some of your Facebook information by sharing it with a company called Cambridge Analytica. In most cases, the information was limited to public profile, Page likes, birthday, and current city.

You can learn more about what happened and how you can remove apps and websites anytime if you no longer want them to have access to your Facebook information.

There is more work to do, but we are committed to confronting abuse and to putting you in control of your privacy.
Uber’s Challenges

“We ignite opportunity by setting the world in motion.”
-- Uber mission statement

Image Source (from left to right): Al Jazeera; Wikimedia; Wikimedia
“We give everyone the power to create and share ideas and information instantly and without barriers.”  -- Twitter mission statement
“Our mission is to ensure that artificial intelligence benefits all of humanity.”  --- Open AI Mission Statement
 Raises Difficult Questions

• What are the obligations of a platform to police the content that is posted on it? Does it depend on if the platform is a monopoly or not?
• Who owns the underlying data about the users of internet platforms? Under what conditions can it be shared/sold?
• Are platforms businesses or simply technologies for matching? Should this difference impact how they treat their employees?
• What responsibility do companies have for how their products are used by others?

And this is just scratching the surface of the difficult questions we now confront...
Pushback from Policymakers
"How do you sustain a business model in which users don’t pay for your service?"

-- Senator Orrin Hatch
# Public Concern

## US Social Media Users Who Feel That Facebook Protects Their Privacy/Data, by Generation, 2021 & 2022

<table>
<thead>
<tr>
<th>Generation</th>
<th>2021</th>
<th>2022</th>
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</thead>
<tbody>
<tr>
<td>Gen Z (18-25)</td>
<td>18%</td>
<td>28%</td>
</tr>
<tr>
<td>Millennials (26-41)</td>
<td>28%</td>
<td>29%</td>
</tr>
<tr>
<td>Gen X (42-57)</td>
<td>19%</td>
<td>28%</td>
</tr>
<tr>
<td>Baby boomers (58-76)</td>
<td>10%</td>
<td>21%</td>
</tr>
<tr>
<td>Total</td>
<td>18%</td>
<td>27%</td>
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</tbody>
</table>

Note: among respondents who used the platform in the past 12 months and agree/strongly agree, based on a 7-level agreement, to the statement, "I am confident that this social platform protects my privacy and data"

Source: Insider Intelligence, "US Digital Trust Benchmark 2022," Sep 2022
Support for more regulation of tech companies has declined in U.S.

% of U.S. adults who say major technology companies should be regulated by the government ___ they are now

- More than: 56 (Apr '21) → 44 (Apr-May '22)
- The same as: 51 (May '18) → 32 (Jun '20) → 33 (Apr '21)
- Less than: 9 (May '18) → 9 (Jun '20) → 20 (Apr-May '22)

Note: Those who did not give an answer are not shown.
Source: Survey of U.S. adults conducted April 25-May 1, 2022.
The Beginnings of a Change

Section 230, which is a liability shielding gift from the U.S. to “Big Tech” (the only companies in America that have it - corporate welfare!), is a serious threat to our National Security & Election Integrity. Our Country can never be safe & secure if we allow it to stand.....

.....Therefore, if the very dangerous & unfair Section 230 is not completely terminated as part of the National Defense Authorization Act (NDAA), I will be forced to unequivocally VETO the Bill when sent to the very beautiful Resolute desk. Take back America NOW. Thank you!

6:45 PM · Dec 1, 2020

Digital Services Act and Digital Markets Act
Stepping stones to a level playing field in Europe

Image Source (Left to Right), Wikimedia, European Economic and Social Committee, Twitter
Central Themes

• The impacts of technology are not fixed. They reflect a set of “design” choices. Those design choices encode a set of values.

• The impacts also reflect choices about what policies and regulations society chooses to put in place.

• When competing values are at stake, they must be weighed against one another. Who weighs these values and how? These are critical questions of governance, politics, and power.

• Going forward, you will be a central participant in this drama. Understanding your role(s) and exploring/debating the values you want to see encoded are a modern form of civic duty.
Evolution of Governance

• 1st Generation: Technology was a product of government researchers/academics/ “hackers”. They defined the underlying code and architecture.

• 2nd Generation: Technology is generated by the commercial sector. The people inside companies—engineers, product managers, designers, sales people, and executives—set the rules, with limited oversight from government.

• 3rd Generation: Technology becomes a (mainstream) issue in politics, and outcomes reflect a push-and-pull between the companies that make things, the governments that oversee them, and the people/users who are affected by them.
Historical Precedent: Internet

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**Spam with everything**
Spam as % of total e-mail

Source: Brightmail.

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**VIRUSES CAN BE SPREAD THROUGH**
- Email
- Social Networks
- Text Messages
- Internet Downloads
A world of insecurity

Worldwide

Information-security spending
$bn

Breached records
m

Sources: Gartner; Risk Based Security; Ponemon Institute

*Estimate  †Forecast
Navigating the Moment

We want you to prepare you for this moment by:

- Exploring technological frontiers that surface difficult trade-offs and require us to grapple with competing values
- Making those competing values explicit and thinking about why we might prioritize some over others
- Investigating the underlying technologies to understand how design choices can produce different outcomes
- Thinking hard about how we should choose the values we want new technologies to encode
- Grappling with the role of regulation and policy in mitigating the potential harms of new technologies
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Expectation Setting

• We are going to ask you to read and write a lot! These will be key ways in which you gain familiarity with the ethical and policy dimensions of new technologies.

• We will encourage you to share your views in lecture and discussion, and you can expect that we will challenge you in an effort to sharpen your views.

• You will leave the class with more questions than answers, because the issues we are tackling do not have a right answer.
The course will focus on six frontiers that (a) you are likely to play a role in shaping over the next decade and (b) where engagement with material from philosophy, social science, and public policy is likely to be helpful.

1. Algorithmic Decision-Making
2. Political Economy of Tech Sector
3. Data Collection, Privacy, and Civil Liberties
4. Artificial Intelligence and Autonomous Systems
5. Power of Private Platforms
6. Blockchain, Decentralization, and Cryptocurrency
Throughout the course, we will foreground two cross-cutting themes:

• First, issues of **diversity, equity, and inclusion** which focus our attention on who has power, voice, and influence in shaping the design and regulation of technology.

• Second, issues of **political economy** which focus our attention on the interplay of markets and governments in shaping what technology gets built, who benefits from that technology, and how any harmful impacts are/are not mitigated.
Different Lenses

Technologist

Philosopher

Policymaker

Image Source: Wikimedia, CC BY-SA 4.0
Most units will have a two-week sequence of lectures, discussions, and assignments

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
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<tbody>
<tr>
<td><strong>Promise and Perils</strong></td>
<td><strong>Bringing to Life</strong></td>
</tr>
<tr>
<td><em>Intro to topic and competing values at stake</em></td>
<td><em>Moderated discussion with experts</em></td>
</tr>
<tr>
<td><strong>Technical Deep Dive</strong></td>
<td><strong>Tensions and Trade-offs</strong></td>
</tr>
<tr>
<td><em>Overview of relevant computer science concepts</em></td>
<td><em>Interactive discussion of a case study related to the unit (taking place in SECTION)</em></td>
</tr>
<tr>
<td><strong>Rights and Responsibilities</strong></td>
<td><strong>Making Choices</strong></td>
</tr>
<tr>
<td><em>Policy implications and social science research</em></td>
<td><em>Designing a product/system/policy in light of competing values and trade-offs</em></td>
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We will bring to campus a group of distinguished practitioners with relevant perspectives on the key issues we’ll be discussing.

Speakers will include:
• Executives of major companies
• Prominent journalists
• Distinguished former politicians
• Leading activists and organizers within tech sector

Featured guest speakers this year include Meredith Whittaker (Signal), Meg Mitchell (Hugging Face), Pattie Maes (MIT Media Lab), TuongVy Le (Bain Capital Crypto), and Dave Morin (Slow Ventures).
Each discussion of tensions and trade-offs will be organized around a case study we have developed specially for this course. The narrative case studies are written by professional journalists and include primary source materials for you to review.

Case study discussions will be highly participatory and will take place during your weekly discussion section. Please note the dates of the case study discussions on the syllabus.
Lecture

• Attendance at lectures and sections is mandatory.

• Lectures will be highly participatory. We will ask you questions, invite your questions, encourage you to talk to your neighbors, and think through the critical issues together.

• If you are unable to attend a lecture because of COVID or another health emergency, please email your teaching assistant to seek access to a recording.
• We have a terrific, interdisciplinary team of teaching assistants from computer science, philosophy, political science, law, and sociology.

• They will meet with you in small groups once a week to discuss critical issues raised in lecture and the readings.

• Section attendance is mandatory and active participation is essential to success in the course.

• You will submit preferences for section times via a form on the CS182 web site (https://web.stanford.edu/class/cs182/). The form will be available until 5pm Sun., Jan. 15th.
There is an enrollment limit of 125 students for CS182W
  • This limit is set by the Technical Communications Program based on how many WIM students they can support

When CS182W reached its enrollment limit, a waitlist was activated on Axess

If any enrolled students drop CS182W, others will be enrolled in the class from the waitlist (in the order they signed up)
  • You can add yourself to the CS182W waitlist on Axess if you are not already enrolled and are trying to get into CS182W

Of course, we strongly encourage you to take the non-WIM version as it has no enrollment cap!
Your Role

• Come to lecture and section having done and digested the readings

• Engage actively in discussion

• Complete the five required assignments
  • Algorithmic Decision-Making (Technical)
  • Privacy (Essay)
  • Autonomous Systems (Policy Memo)
  • Platforms and Social Networks (Technical)
  • Final Reflection Assignment