STEVENS
INSTITUTE of TECHNOLOGY
Schaefer School of Engineering & Science

CS 485:
Societal Impacts of Information Technology

Fall 2017

Prof. Eric Koskinen

Groups

- **Group 1**. Topic? Article?
- **Group 2**. Topic? Article?
- **Group 3**. Topic ideas? Reservations accepted!
- **Newcomer** group assignments.

Code of Ethics

Why do we have/need ethics?

Code of Ethics

Why do we have/need ethics?

- Same goals as laws.
- Know where the boundaries are.
- Every profession’s guiding principles. e.g. Hippocratic Oath in Medicine.
- Otherwise could take advantage.
- Software is everywhere now, so software engineering ethics matter.

MIT Technology Review

A View from **Vivek Wadhwa**

Laws and Ethics Can't Keep Pace with Technology

Employers can get into legal trouble if they ask interviewees about their religion, sexual preference, or political affiliation. Yet they can use social media to filter out job applicants based on their beliefs, looks, and habits. Laws forbid lenders from discriminating on the basis of race, gender, and sexuality. Yet they can refuse to give a loan to people whose Facebook friends have bad payment histories, if their work histories on LinkedIn don't match their bios on Facebook, or if a computer algorithm judges them to be socially undesirable.

These regulatory gaps exist because **laws have not kept up with advances in technology**. The gaps are getting wider as technology advances ever more rapidly. And it's not just in employment and lending—the same is happening in every domain that technology touches.

Association for Computing Machinery

Software engineers shall commit themselves to making the analysis, specification, design, development, testing and maintenance of software a beneficial and respected profession.

In accordance with their commitment to the health, safety and welfare of the public, software engineers shall adhere to the following principles:

http://www.acm.org/about/se-code

Association for Computing Machinery

1. **PUBLIC** - Software engineers shall act consistently with the public interest.
2. **CLIENT AND EMPLOYER** - Software engineers shall act in a manner that is in the best interests of their client and employer consistent with the public interest.
3. **PRODUCT** - Software engineers shall ensure that their products and related modifications meet the highest professional standards possible.
4. **JUDGMENT** - Software engineers shall maintain integrity and independence in their professional judgment.
5. **MANAGEMENT** - Software engineering managers and leaders shall subscribe to and promote an ethical approach to the management of software development and maintenance.
6. **PROFESSION** - Software engineers shall advance the integrity and reputation of the profession consistent with the public interest.
7. **COLLEAGUES** - Software engineers shall be fair to and supportive of their colleagues.
8. **SELF** - Software engineers shall participate in lifelong learning regarding the practice of their profession and shall promote an ethical approach to the practice of the profession.

Presentations

Sample Topics

- Biometric readers
- The sharing economy
- When is it OK to take people's pictures?
- Unexpected effects of social media
- Unexpected effects from the ease with which information can spread
- Mission and activities of the Electronic Frontier
- Self driving cars/planes
- Retail electronic payment systems
- Electronic currencies
- Economic models for information and information-based services
- Online anonymity
- Should Internet access be a fundamental human right?

Sample Topics

- Software patents
- Software licensing
- Internet governance
- Internet culture clash
- Privacy implications of mining big data
- Net neutrality
- Tor
- High frequency trading
- Video game streaming
- Telemedicine
- GPS spoofing
- The Turing test
- Internet shaming
- Uber surge pricing
- The right to be forgotten.

Articles

- Choose a few articles on your topic.
- Typically these will be newspaper articles.
    - e.g. NY Times Science /Business section,
- Could also be magazine articles.
    - e.g. Nature, Wired
- Journal Articles
    - CACM
- At least one should be a longer exposition.

Presentation Content

Summarize Topic/Article. 5 W's.	
Identify **Technology Involved**	What is the technology? How does it work? Dig deeper: product web page?
Identify **Stakeholders.**	May not be mentioned in the article. Think about who they might be? Individuals? Groups? Society? Justify.
Identify **Major Impacts.**	For each stakeholder.
Advantages and Disadvantages.	For each stakeholder. Justify each.
Other **issues/challenges.**	
Identify **Ethical Concerns**.	e.g. Impact X may violate human right Y of stakeholder Z.
Identify **Code of Ethics** standards.	Do any apply? If so, how?
Discuss possible **solutions**/alternatives.	Why should we be restricted to this situation?

Presentation Content

Let's do an example.

Here was an article that interested me.

Presentation Content

BBC | Sign in | News | Sport | Weather | Shop | Earth | Travel | M

NEWS

Home | Video | World | US & Canada | UK | Business | Tech | Science | Magazine | Ent

Business | Market Data | Markets | Global Trade | Companies | Entrepreneurship | Techn

A former Volkswagen engineer who helped develop a device that enabled cars to evade US pollution rules has been sentenced to more than three years in prison and ordered to pay $200,000.

James Liang, 63, was the first person prosecuted in the emissions scandal.

The US investigation has led to charges against seven others in the US and sparked probes in other countries.

Volkswagen has admitted guilt, agreeing to spend as much as $25bn to address US claims.

Liang co-operated with prosecutors, who argued that his help with the investigation warranted a reduction in the possible punishment to three years in prison and a $20,000 fine.

But US District Court Judge Sean Cox opted for a harsher penalty of 40 months and a $200,000 penalty, saying he wanted to send a message to others in the car industry.

August 2017

Presentation Content

That article lead me to more questions,
so I went back to also read:
an earlier October 2016 NPR article,
and a Dec 2015 BBC article

Presentation Content

Summarize Topic/Article. 5 W's.	Settlement. Software installed that cheated emissions tests.
Identify **Technology Involved**	Reduce emissions. Cars increasingly self-driving. Software matters. Emissions cheating: better in test conditions.
Identify **Stakeholders.**	Federal judge, VW, US Govt', EPA, Consumers. High-level VW management, low-level VW employees, SWE James Liang
Identify **Major Impacts.**	Gov't is forcing manufacturers to reduce emissions. VW stock went down. Settled quickly to move forward.
Advantages and Disadvantages.	VW capturing US market for diesel
Other **issues/challenges.**	
Identify **Ethical Concerns**.	Cheating. Pollution leads to health problems. Self-driving cars: life and death.
Identify **Code of Ethics** standards.	
Discuss possible **solutions**/alternatives.	

Example

Summary

- **Summary**
  - Volkswagen wanted to capture US market with low diesel emissions
  - Built software that would detect when a test was happening and cheat.
  - Scientists caught VW cheating and court case was brought by the government/consumers/EPA.
    - Volkswagen punished with $25bn, Software Engineer prison.
- **Technology Involved**
  - x
  - y
  - z

Stakeholders & Impacts

Example

- **Volkswagen Upper Management**
    - Lost $25bn to resolve the issue.
    - Tarnish reputation and, thus, brand.
    - Wanted to lead in the US, now set back.
- **James Liang and other VW employees**
    - Prison, Fine, Reputation
- **Government/EPA**
    - The fine demonstrated that EPA takes it seriously.
    - Testing mechanism not rigorous enough. Invest more in testing.
- **American People, World**
    - Environmental damage

Example

Advantages & Disadvantages

- **Further discussions . . .**

Example

Code of Ethics

- **James Liang and other VW employees**
  - Not “mastermind”
  - But “abdicated his responsibility to speak out”
  - “Unless individual actors are also punished, future corporate employees and contractors may be tempted to justify their criminal behavior as just ‘doing their jobs’ or ‘following orders’.” (Said the prosecutors)
- **Code of Ethics** that apply
  - ACM. “commitment to the health, safety and welfare of the public”

Code of Ethics

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Managers violated this one

Example

Better Solutions

- Better testing by the EPA
- Outlet/recourse for Software Engineers under duress
- Require this kind of software/technology to be published. Use of open source software?
- Find the “mastermind” rather than the fall guy

Stances

- **Stances:**

    1. **Software engineer should not be jailed**. He was a fall man. They should have found the “mastermind.”

    2. **Software engineer should be jailed**. Fair punishment for violating the Code of Ethics. With even more jail time, every software engineer would know about it and take caution.

    3. **EPA should not receive the fine**. Testing was insufficient. Money should go to the public, climate change organization, etc. Fund the scientists who discovered the cheating.

    4. **Case is blown out of proportion**. No one died. Diesel emissions is small compared to unleaded emissions, especially in developing nations. Wasting time on small issues rather than investing the time/money in major changes.

Presentations

1. Pick a topic.
2. Pick some articles.
3. Read the articles. Dig deeper. Organizations' web pages.
4. Discuss as a group.
5. Prepare slides.
6. Do practice talks. Refine slides. Figure out gaps.
7. Prepare to defend stances.