Today’s Class

• Check your scores and let Fran know if anything is not right.

• Briefing due 11/22 11:59 p.m.

• Lecture

• **Personal Essay 4/Op-Ed instructions**

• Presentations

• Guest speaker **next time**: Bruce Schneier, Harvard U.
Reading for next class

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Speaker</th>
<th>Date</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-31</td>
<td>Introduction</td>
<td>Fran</td>
<td>9-3</td>
<td>The Data-driven world</td>
<td>Fran</td>
</tr>
<tr>
<td>9-10</td>
<td>Data and COVID-19 - models</td>
<td>Fran</td>
<td>9-14</td>
<td>Data and COVID-19 – contact tracing</td>
<td>Fran</td>
</tr>
<tr>
<td>9-17</td>
<td>Data and the Opioid Crisis</td>
<td>Liz Chiarello</td>
<td>9-21</td>
<td>Data and Privacy - Intro</td>
<td>Fran</td>
</tr>
<tr>
<td>9-24</td>
<td>Data and Privacy – Differential Privacy and the Census</td>
<td>Fran</td>
<td>9-28</td>
<td>Data and Privacy – Anonymity</td>
<td>Fran</td>
</tr>
<tr>
<td>10-1</td>
<td>Data and Privacy - Law</td>
<td>Fran</td>
<td>10-5</td>
<td>Digital rights in the EU and China</td>
<td>Fran</td>
</tr>
<tr>
<td>10-8</td>
<td>Data and Elections 1</td>
<td>Fran</td>
<td>10-12</td>
<td>NO CLASS – Columbus / Indigenous Peoples’ Day</td>
<td>Fran</td>
</tr>
<tr>
<td>10-15</td>
<td>Data and Elections 2</td>
<td>Fran</td>
<td>10-19</td>
<td>Data and Elections 3</td>
<td>Fran</td>
</tr>
<tr>
<td>10-22</td>
<td>Data and Elections 4</td>
<td>Todd Rogers</td>
<td>10-26</td>
<td>Data and Research 1 / PERSONAL ESSAY 3</td>
<td>Fran</td>
</tr>
<tr>
<td>10-29</td>
<td>Data and Research 2</td>
<td>Josh Greenberg</td>
<td>11-2</td>
<td>Data and Discrimination 1 / PERSONAL ESSAY 3 DUE NOV 4</td>
<td>Fran</td>
</tr>
<tr>
<td>11-5</td>
<td>Data and Discrimination 2 / BRIEFING (TEAMS OF 2)</td>
<td>Fran</td>
<td>11-9</td>
<td>Data and the IoT 1</td>
<td>Fran</td>
</tr>
<tr>
<td>11-12</td>
<td>Data and the IoT 2</td>
<td>Fran</td>
<td>11-16</td>
<td>Data and Ethics / PERSONAL ESSAY 4 or OP-ED instructions</td>
<td>Fran</td>
</tr>
<tr>
<td>11-23</td>
<td>Cybersecurity / BRIEFING DUE 11/2</td>
<td>Bruce Schneier</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-30</td>
<td>Data Infrastructure</td>
<td>Fran</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-3</td>
<td>Data Science / PERSONAL ESSAY OR OP-ED DUE 11/2</td>
<td>Fran</td>
<td>12-7</td>
<td>Data Careers</td>
<td>Kathy Pham</td>
</tr>
<tr>
<td>12-10</td>
<td>Wrap-up</td>
<td>Fran</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Data and Ethics

• Ethics and Data
• Ethics and AI
• Ethics and CAVs
Ethics and Data

• Multiple areas for development of “data ethics”
  
  – **Data collection and handling** (e.g. generation, recording, curation, processing, dissemination, sharing)
  
  – **Data algorithms** (e.g. AI, artificial agents, machine learning, robots)
  
  – **Data practice** (e.g. responsible innovation, programming, hacking, professional codes)
Ethics and AI: Many challenges ahead

- World Economic Forum Top 9 ethical issues in AI:
  1. **Unemployment.** What happens after the end of jobs?
  2. **Inequality.** How do we distribute the wealth created by machines?
  3. **Humanity.** How do machines affect our behavior and interaction?
  4. **Artificial stupidity.** How can we guard against mistakes?
  5. **Racist robots.** How do we eliminate AI bias?
  6. **Security.** How do we keep AI safe from adversaries?
  7. **Evil genies.** How do we protect against unintended consequences?
  8. **Singularity.** How do we stay in control of a complex intelligent system?
  9. **Robot rights.** How do we define the humane treatment of AI.

Information from

Fran Berman, Data and Society, CSCI 4370/6370
CAV ethics: Whom should your car hit?

• **Utilitarian ethics:** The best action is the one that maximizes utility (e.g. well-being of humans)
  
  – *What is good behavior?* [Francis Hutcheson*]: Virtue is in proportion to the number of people a particular action brings happiness to. Vice / evil is proportionate to the number of people made to suffer.

• **Who should be saved (number → value)?**
  
  – Smaller vs. greater number of people?
  – You vs. others?
  – Your family vs. others?
  – “Good” people vs. “bad” people?

• **Should the utility function focus on minimizing bad outcomes vs. optimizing good outcomes?**

• **Does there need to be a single ethical system for CAVs?**

The Moral Machine Experiment – exploring utilitarian ethics

• Moral machine experiment: Multilingual on-line serious game for collecting large-scale data on how citizens would want autonomous vehicles to solve moral dilemmas in the context of unavoidable accidents.

• “Players”: Individuals from 233 countries providing information about ~40M decisions
  – Geolocation information collected about users
  – Users could volunteer age, gender, income, education, religious and political attitudes

• Play: Users shown unavoidable accident scenarios with two possible outcomes, depending on whether vehicle swerves or stays on course. Users click on the outcome they find most preferable.
Ethical dilemmas

- Spare passengers vs. others
- Spare humans vs. pets
- Spare more lives vs. fewer lives
- Spare men vs. women
- Spare young vs. old
- Spare pedestrians crossing legally vs. jaywalkers
- Spare those who are fit vs. those who are less fit
- Spare those with higher social status vs. those with lower social status
- Stay on course vs. swerving (preference for action)
Results
From https://www.nature.com/articles/s41586-018-0637-6.pdf

Fig. 2 | Global preferences. a, AMCE for each preference. In each row, ΔP is the difference between the probability of sparing characters possessing the attribute on the right, and the probability of sparing characters possessing the attribute on the left, aggregated over all other attributes. For example, for the attribute age, the probability of sparing young characters is 0.49 (s.e. = 0.0008) greater than the probability of sparing older characters. The 95% confidence intervals of the means are omitted owing to their insignificant width, given the sample size (n = 35.2 million). For the number of characters (No. characters), effect sizes are shown for each number of additional characters (1 to 4; n₁ = 1.52 million, n₂ = 1.52 million, n₃ = 1.52 million, n₄ = 1.53 million); the effect size for two additional characters overlaps with the mean effect of the attribute. AV, autonomous vehicle. b, Relative advantage or penalty for each character, compared to an adult man or woman. For each character, ΔP is the difference between the probability of sparing this character (when presented alone) and the probability of sparing one adult man or woman (n = 1 million). For example, the probability of sparing a girl is 0.15 (s.e. = 0.003) higher than the probability of sparing an adult man or woman.
Data clustering

- Geolocation data used to identify 130 countries with >100 respondents.
- Clustering analysis identified 3 distinct “moral clusters” of countries:
  - **Western cluster**: North America and many European countries of Protestant, Catholic, and Orthodox Christian cultural groups. [Particular sub-clusters contained Scandinavian countries and another contained Commonwealth countries]
  - **Eastern Cluster**: Japan, Taiwan and other countries that belong to the Confucianist cultural group, as well as Islamic countries such as Indonesia, Pakistan and Saudi Arabia
  - **Southern Cluster**: Latin American countries of Central and South America. Also some countries characterized in party by French influence, France, French overseas territories and territories that were at some point under French leadership).
Moral Machine Clusters

Image: https://www.nature.com/articles/s41586-018-0637-6.pdf
Ethical predictors

Global preferences (strong preferences across all respondents)
- Spare humans over animals
- Spare more lives over fewer
- Spare young lives over old

Differences in ethical clusters (clusters differ in the weight they give to some preferences):
- Individualistic cultures and collective cultures
  - Respondents from individualistic cultures show greater preference for sparing more characters
  - Respondents from collective cultures show greater preference for sparing elders
- Cultures with greater prosperity and quality of laws and institutions vs. those with lesser
  - Greater preference for law-abiding pedestrians vs. jaywalkers
- Respondents from cultures with more economic inequality treat people of stature somewhat differently
- Women were less expendable than men in general but respondents in countries where there are higher ratios of female to male life expectancy and sex ratio at birth saw men as even less expendable than women
Caveats

• Study pool is big but respondents were self-selecting
  – Samples should not necessarily be construed as representative

• No uncertainty introduced about the classification of characters
  – In real life, one individual may have many attributes and varying value to the respondent

• No hypothetical relationships between respondents and characters assumed (family, friends, etc.)
Ethical Guidelines for self-driving cars in Germany

- Commission included 14 scientists and legal experts, and Ministry said it would implement and enforce the guidelines.
- Germany home to major automakers such as BMW, Daimler and Volkswagen.

[Link to guidelines]

Fran Berman, Data and Society, CSCI 4370/6370
2016 Ethical rules for Automated and Vehicular Traffic
(excerpt, paraphrased)

1. Primary purpose of autonomous vehicles is to improve safety and increase mobility.

2. Prevent accidents when possible

3. Save people over everything else

4. Public sector responsible for guaranteeing safety through regulation, policy, enforcement

5. Liability or damage should be governed by the usual product liability principles

6. It should be clear who is controlling the car. Drivers should receive training in the operation of autonomous vehicles.
In accident situations, any distinction based on personal features (age, gender, physical or mental constitution) is strictly prohibited.

Genuine dilemmatic decisions, such as the decision between one human life and another cannot be clearly standardized, nor can they be programmed.

Permitted business models must respect limitations in the autonomy and data sovereignty of road users.

Complete connectivity and central control of all motor vehicles is ethically questionable if it is unable to safely rule out the total; surveillance of road users and manipulation of vehicle control.
Ethics becoming increasingly important, especially in the wake of AI and IoT

- How do we implement ethical behavior for tech systems?
- Whose ethics?
- Who is accountable/liable/responsible for unethical behavior?
- Personal ethics vs. group ethics?
- Can we expect tech to resolve issues of ethics that we have not come to consensus on in society?
Lecture 21 Sources (not already on slides)


- “What is Data Ethics?”, http://rsta.royalsocietypublishing.org/content/374/2083/20160360

Last Assignment: Personal Essay 4/Op-Ed

Instructions

• Pick **ONE** of the following assignments. **LET FRAN KNOW WHICH ONE YOU ARE DOING.** Assignments are due by 11:59 p.m. on 12/2.

  – **Option 1: Personal Essay #4** -- You have 15 minutes with the President Elect. Tell him what you think the administration’s highest data-related priority should be and what specific thing the U.S. government should do to accomplish it. (**8 points**, usual grading rubric)

    OR


• **Note:** Both options contribute up to the last 8 points of your grade. If you choose the Op-Ed option, up to 6 additional points of extra credit will be added to your total (depending on what you get)
More information. Remember to CHOOSE ONE

• Op-Ed (14 points)
  – This is a persuasive piece. Your Op-Ed should convince the reader of something somewhat controversial. (Format and grading rubric information in lecture on 10/8)

• Personal Essay (8 points)
  – This is a descriptive piece. Your piece should describe the highest-priority data-related action you think the President Elect should do. (More instructions in lecture on 9/3)
Presentations
• Presentations for November 23
  – “Security bugs let these hackers remotely control a Mercedes Benz”,

  – “Officials warn of cyberattacks on hospitals as virus cases spike” New York Times,

• Presentations for November 30
  – “How Millennial Parents are re-inventing the cherished family photo album”,
    The Atlantic,

  – “A Team of Volunteers Is Archiving SoundCloud in Case It Dies”, Vice,
    https://www.vice.com/en/article/a3d4x8/archive-team-soundcloud [update as you can]
Need volunteers

- These are the last scheduled presentations. Make sure that you have signed up for two throughout the semester

- Presentations for 12/3
  - “Cooling our insatiable demand for data”, Science, https://science.sciencemag.org/content/370/6518/783 (Zach S.)

- Presentations for 12/7
• Presentations for Today

– “Facebook’s threat to the NYU Ad Observatory is an attack on ethical research”, Neiman Lab, https://www.niemanlab.org/2020/10/facebooksthreat-to-the-nyu-ad-observatory-is-an-attack-on-ethical-research/

– “Google offers to help others with the tricky ethics of AI”, Ars Technica, https://www.wired.com/story/google-help-others-tricky-ethics-ai/