

# Computational Analysis and Ethics

**Dr. Richard W. Evans**

November 21 and 27, 2018

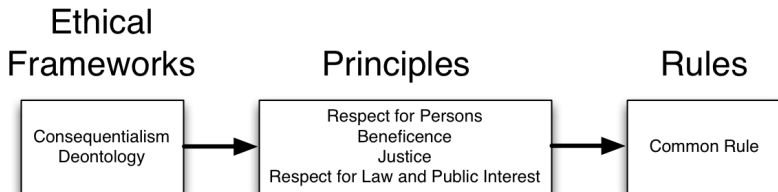
# Ethical research

## Def'n: Ethics

**Ethics:** A branch of philosophy that involves systematizing, defending, and recommending concepts of right and wrong conduct.

- We focus on ethical research with regard to subjects, participants, administrators, communities, institutions, and organizations.
- Digital age creates new ethical challenges: privacy, uncertainty, informed consent
- **Goal:** develop shared ethical norms that maximize good and minimize bad

# Structure of discussion



# Research Ethics in the U.S.

## Must acknowledge

In the past, researchers have done awful things in the name of Science

- Implies that researchers could currently be doing bad things
- Implies that we could inadvertently do bad things

## Moral of the story

Do your best to avoid doing bad things to people in research

# Tuskegee Syphilis Study

- 1932: Approximately 400 black men with syphilis are enrolled in the study; they are not informed of the nature of the research
- 1937-38: The PHS sends mobile treatment units to the area, but treatment is withheld for the men in the study
- 1942-43: In order to prevent the men in the study from receiving treatment, PHS intervenes to prevent them from being drafted for WWII
- 1950s: Penicillin becomes a widely available and effective treatment for syphilis; the men in the study are still not treated (Brandt 1978)
- 1969: The PHS convenes an ethical review of the study; the panel recommends that the study continue
- 1972: Peter Buxtun, a former PHS employee, tells a reporter about the study, and the press breaks the story
- 1972: The US Senate holds hearings on human experimentation, including Tuskegee Study
- 1973: Gov't officially ends the study, authorizes treatment for survivors
- 1997: U.S. Pres. Clinton publicly and officially apologizes for the Study

# Tuskegee Syphilis Study

- Study designed to document history of disease in black males
- All 400 men were black
- All 400 were from around Tuskegee, Alabama—a poor town
- They were deceived as to the nature of the study: “bad blood”
- They were given false and ineffective treatment

## Takeaways

- 1 Some studies should not happen
- 2 Research can harm participants, families, communities
- 3 Researchers can make terrible ethical decisions
- 4 **Belmont Report (1978)** was a direct response to Tuskegee Study

# U.S. Reforms

- Belmont Report (1978) response to Tuskegee Study
  - Respect for Persons, Beneficence, Justice
  - Not great for day-to-day research governance
- Common Rule guidelines for administration of research
  - Process for reviewing, approving, overseeing
  - IRB enforces Common Rule principles
- Common Rule governs all research funded by U.S. Gov't
- Common Rule does not automatically apply to companies or institutions that do not receive gov't funding

# U.S. Digital Reforms

- 1990s, 2000s, computer security researchers studies hacked weak-password computers
- Dep't Homeland Security: blue ribbon commission write guideline for research on information and communication technologies (ICT)
  - Menlo Report (2011) was the result
  - Report adds *Respect for Law and Public Interest* to Respect for Persons, Beneficence, and Justice
- Encore (2015) project passed Menlo Report IRB at Georgia Tech
  - IRB said did not deal with human subjects
  - Censorship research had implications for human subjects
- Menlo Report suggests we expand the stakeholders of a research project



# Facebook Emotional Contagion

Kramer, Guillory, Hancock (2012)

- One week, Jan. 2012, 700K Facebook users
- Group 1: “negativity reduced”: posts with negative words randomly blocked
- Group 2: “positivity reduced”: posts with positive words randomly blocked
- Control Group 1: for negativity reduced Group 1
- Control Group 2: for positivity reduced Group 2

## Findings

- Positivity reduced group used fewer positive words and more negative words
- Negativity reduced group used more positive words and fewer negative words
- Evidence for emotional contagion

# Facebook Emotional Contagion

- What are the ethical issues?
  - Potential emotional harm to positivity reduced
  - Potential emotional inflation to negativity reduced
  - Content manipulated/censored without permission
- Published in *Proceedings of the National Academy of Sciences*
- After published, outcry from researchers and press
- Participants did not provide consent beyond Facebook terms of service
- Study had no third-party ethical review (IRB)

# Facebook: University network

Wimmer and Lewis (2010) and Lewis, Gonzalez, and Kaufman (2012)

- Beginning in 2006, scrape Facebook profiles of “diverse private college in Northeastern U.S.”
- Merge with University data
- Researchers made these anonymized data public
- Study how friendships, cultural tastes, networks are associated with administrative and educational characteristics
- How do social networks form?
- How do social networks and behavior co-evolve?
- What are the ethical issues?
  - Privacy disclosure
  - No informed consent from University or Facebook
  - **Question:** Is web scraping unethical?

# Facebook: University network

## Big problem

Days after data were made public, researchers deduced that University was Harvard College

- Lots of bad press followed

## Encore: Government Censorship

Burnett, Sam and Nick Feamster, "Encore: Lightweight Measurement of Web Censorship with Cross-Origin Requests," in *Proceedings of the 2015 ACM Conference on Special Interest Group on Data Communication*, ACM, London, (2015), pp. 653-657.

- Encourage website owners to install small code snippet

```
<iframe src="//encore.noise.gatech.edu/task.html"
        width="0" height="0"
        style="display: none"></iframe>
```

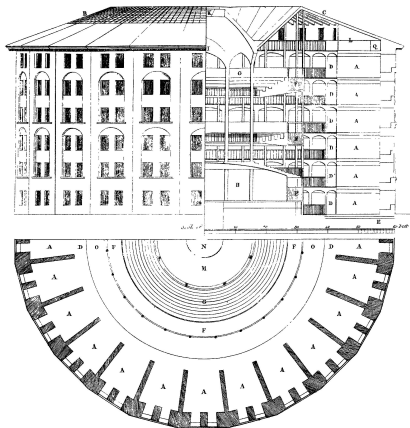
- Used peoples computers to ping sites that might be censorship targets
- Real-time measure of web censorship
- What might be ethical issues?
  - People's web browser history includes sensitive sites
  - Repressive regimes could punish unwitting visits

# Digital is different

*“Researchers—often in collaboration with companies and governments—have more power over participants than in the past, and the rules about how that power should be used are not yet clear.”*

*“...researchers must decide how to exercise their power based on overlapping rules, laws, and norms.”*

# Panopticon Prison Metaphor, mass surveillance



- Jeremy Bentham (1791): Central observer sees all without being seen

## Secondary use of data

- Unintended/intended secondary use: potentially big risk
- Data systems and human rights violations

Place	Time	Targeted groups	Data System	Human rights violation
Australia	19th, early 20th century	Aborigines	Population registration	Forced migration, elements of genocide
China	1966-76	Bad-class origin during cultural revolution	Population registration	Forced migration, instigated mob violence
France	1940-44	Jews	Population registration, special censuses	Forced migration, genocide
Germany	1933-45	Jews, Roma, and others	Numerous	Forced migration, genocide
Hungary	1945-46	German nationals and those reporting German mother tongue	1941 population census	Forced migration



## Secondary use of data

Place	Time	Targeted groups	Data System	Human rights violation
Netherlands	1940-44	Jews, Roma	Population registration systems	Forced migration, genocide
Norway	1845-1930	Samis, Kvens	Population censuses	Ethnic cleansing
Norway	1942-44	Jews	Special census and proposed population register	Genocide
Poland	1939-43	Jews	Primarily special censuses	Genocide
Romania	1941-43	Jews, Roma	1941 pop. census	Forced migration, genocide
Rwanda	1994	Tutsi	Population registration	Genocide
South Africa	1950-93	African and "colored" pop.	1951 population census and population registration	Apartheid, voter disenfranchisement

## Secondary use of data

Place	Time	Targeted groups	Data System	Human rights violation
U.S.A.	1800s	Native Americans	Special censuses, pop. registers	Forced migration
U.S.A.	1917	Suspected draft law violators	1910 census	Investigation and prosecution of those avoiding registration
U.S.A.	1941-45	Japanese Americans	1940 census	Forced migration and internment
U.S.A.	2001-08	Suspected terrorists	NCES surveys and admin. data	Investigation and prosecution of dom. and int'l terrorists
U.S.A.	2003	Arab-Americans	2000 census	Unknown
USSR	1919-39	Minority populations	Various population censuses	Forced migration, punishment of other serious crimes

## Secondary use of data

- These lists are probably an underestimate because most abuses happen in secret
- Randomized controlled experiments (RCTs) are likely happening to us on a daily basis
- Overlapping rules and norms can cause ethics gaps

# Four principles of computational ethics

These principles come from the Belmont Report and the Menlo Report

## ① Respect for persons

- Treat people as autonomous, honor their wishes
- Individuals with diminished autonomy entitled to additional protections
- Participants, not researchers, get to decide
- Informed consent

## ② Beneficence

- Max benefit, min risk, get balance right
- Some learning must involve potential harm
- Transparent analysis
- Account for risk to participants, communities, institutions

## ③ Justice

## ④ Respect for law and public interest

# Four principles of computational ethics

These principles come from the Belmont Report and the Menlo Report

- ① Respect for persons
- ② Beneficence
- ③ Justice
  - Ensure that risks and benefits are distributed fairly
  - Not just protection, but access
- ④ Respect for law and public interest
  - Principle of beneficence broadened to all stakeholders
  - Compliance
  - Transparency-based accountability
  - Prevent the research community from doing things in secret

# Consequentialism and Deontology

These two frameworks allow you to assess fundamental tension in research: using potentially unethical means to achieve ethical goals

- Consequentialism
  - Jeremy Bentham, John Stuart Mill
  - Focuses on actions that lead to better states in the world
  - Beneficence is deeply rooted in consequentialism
  - Focuses on ends
- Deontology
  - Immanuel Kant
  - Focuses on ethical duties, independent of consequences
  - Respect for Persons is deeply rooted in deontology
  - Focuses on means

# Areas of difficulty

- Informed consent
- Understanding and managing informational risk
- Privacy
- Making decisions in the face of uncertainty

## Practical tips

- IRB is a floor, not a ceiling
- Put yourself in everyone else's shoes