



JOHNS HOPKINS

WHITING SCHOOL
of ENGINEERING

AI Ethics and Social Impact

601.770

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How can we develop AI for good and not for bad?

Decisions we make about our data, methods, and tools are tied up with their impact on people and societies

Example: Are there some applications we should not build?

Hypothetical case: should we build a classifier to predict someone's sexual orientation from their photo?

Sexual Orientation Classifier

Who can be harmed by such a classifier?

- Personal attributes (gender, race, sexual orientation, religion) are complex social constructs, not categorial/binary, are dynamic, are private and often not visible publicly
- These are properties for which people are often discriminated against
 - In many places being gay is prosecutable
 - Such a classifier might affect people's employment, family relationships, health care opportunities, etc.

Additional Ethical Questions

- Who can benefit from such a classifier?
- Where does the training data come from?
- Did anyone consent?

Most examples are not so straightforward

Problem:

- Hate speech and offensive language are prevalent on the internet and can lead to tangible harms
- Marginalized people are disproportionately targets of hate speech
- Manually identifying hate speech is difficult for human moderators
 - Too much volume to keep up with
 - Mental toll of reading offensive content

Technical Solution

- Build NLP models to identify hate speech automatically

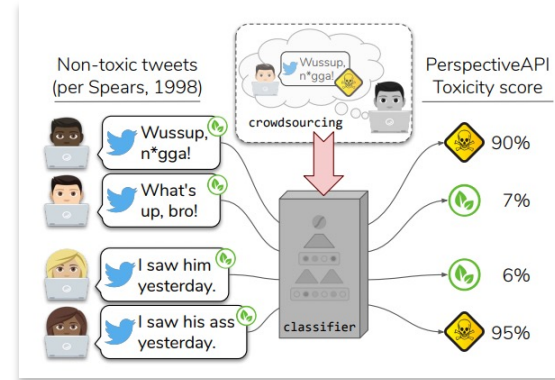
The screenshot shows the ACL Anthology search interface. At the top, the navigation bar includes the ACL Anthology logo and links for FAQ, Corrections, and Submissions. A search bar on the right contains the query "hate speech" and a search icon. Below the search bar, the "Search Results" section is displayed. A blue button with an information icon and the text "How does the search work?" is located to the right of the search results header. Underneath, there are tabs for "All results", "Authors", "Events", and "Paper Metadata". The "All results" tab is selected. Below the tabs, the text "About 4,630 results (0.20 seconds)" is shown, with "4,630 results" highlighted by a red box. To the right, a "Sort by:" dropdown menu is set to "Relevance".

More Problems: NLP models are biased

Term	Toxic	Overall
atheist	0.09%	0.10%
queer	0.30%	0.06%
gay	3%	0.50%
transgender	0.04%	0.02%
lesbian	0.10%	0.04%
homosexual	0.80%	0.20%
feminist	0.05%	0.05%
black	0.70%	0.60%
white	0.90%	0.70%
heterosexual	0.02%	0.03%
islam	0.10%	0.08%
muslim	0.20%	0.10%
bisexual	0.01%	0.03%

Table 1: Frequency of identity terms in toxic comments and overall.

[Dixon et al. 2018]



[Sap et al. 2019]

Even more problems

- How do define what is offensive or hate speech?
 - Norms differ widely in different communities
 - Setting a universal standard is enforcing a majority viewpoint
- Who has control of the technology?
 - Concentrating power in few hands
- How might this technology be abused? (dual use potential)
 - Hate speech generator
 - Censorship

Solutions?

- Don't build NLP for hate speech detection?
- But then what about all the hate speech on the internet?
- Maybe we should ban social media? The internet?

This course will often be about *asking questions* and not necessarily *finding answers*

This Course

- Case studies of ethical challenges in AI research and development
 - Part 1 structured more around ethical challenges (data, privacy, fairness, etc.)
 - Part 2 structured more around applications (social services, criminal justice, healthcare)
 - Some readings are more technical, many are not
- Frameworks and guidelines
 - Code of ethics, policy and regulation
- Identifying and discussing series of questions
 - ~~What is AI?~~
What should AI be? [Virginia Dignum, Interspeech Keynote 2023]

Course website

- <http://ai-ethics-601-770.cs.jhu.edu/fa2023/index.html>
- Please join the course Piazza!
- <https://piazza.com/jhu/fall2023/601770>

Course Format

- Before class:
 - Read 1-2 papers on a topic (don't recommend reading >1 week ahead)
 - Post a short 2-paragraph response on Piazza
 - Responses should not summarize the reading but instead raise points to think about or questions for discussion
 - [Discussion leader: review responses from others in group]
- During class:
 - 45min small discussion groups (6-7 students)
 - Discussion leaders
 - 15min: Discussion leaders share back to the entire class
 - 10min: Intro to next course's readings
 - 5min: Re-arranging tables

Course Project

- Recommended groups of 3ish people
- Can be on any topic related to the course:
 - Technical paper
 - Survey/position paper

Grading

- Coursework (40%):
 - Reading responses (15%)
 - Class participation (25%)
- Project (55%):
 - Project literature review (15%)
 - Project written proposal and presentation (15%)
 - Project final presentation and paper (25%)
- Course goals and midterm feedback responses (5%)

Initial Discussion Groups

- Introduce yourselves
- Decide on a discussion leader for Thursday

First topic: Foundations and Data

- Origins of Research Ethics
- Where does the data come from?
 - Participants, Data, and Labelers

Brief History of Human Subjects Protection

Nuremberg Code of 1947

- Ten principles of research developed for the "Doctors' Trial": American judges trying Nazi doctors accused of murder and torture in their human experiments in the concentration camps.

- Highlights:
 - 1. The voluntary consent of the human subject is ... essential.
 - 2. The experiment should be for the good of society
 - 6. ...risk ... should never exceed ... the humanitarian importance of the problem
 - 9. ...subject should be at liberty to bring the experiment to an end...

Shuster, Evelyne. 1997. "[Fifty years later: the significance of the Nuremberg Code.](#)" *New England Journal of Medicine* 337, 20: 1436-1440.

United States Public Health Services Study in Tuskegee

- 40-year study by the US Public Health Service begun in 1932
- Goal: observe natural history of untreated syphilis
- Enrolled 600 poor African American sharecropper men
 - 400 with syphilis, 200 controls
- Told they would be treated for "bad blood"
- Were not treated, merely studied
 - Were not told they had syphilis
 - Sexual partners not informed
 - By 1940s penicillin becomes standard treatment for syphilis
 - Subjects were not told or given penicillin

Wikimedia Commons,
from National Archives



United States Public Health Services Study in Tuskegee

- 1964 Protest letter from a doctor who reads one of the papers
 - “I am utterly astounded by the fact that physicians allow patients with a potentially fatal disease to remain untreated when effective therapy is available”
- 1965 Memo from authors:
 - “This is the first letter of this type we have received. I do not plan to answer this letter”

United States Public Health Services Study in Tuskegee

- 1966 Peter Buxtun, a PHS researcher in San Francisco, sent a letter to the CDC but study was not stopped.
- 1972 Buxtun goes to the press.
- Senator Edward Kennedy calls congressional hearings
- 1974 Congress passes National Research Act

Syphilis Victims in U.S. Study Went Untreated for 40 Years

By JEAN HELLER
The Associated Press

WASHINGTON, July 25—For 40 years the United States Public Health Service has conducted a study in which human beings with syphilis, who were induced to serve as guinea

have serious doubts about the morality of the study, also say that it is too late to treat the syphilis in any surviving participants.

Doctors in the service say

NY Times July 26, 1972

National Research Act 1974

- Required institutional review of all federally funded experiments
 - Institutional Review Boards (IRBs)
- Created National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research
 - Issued [Belmont Report](#) in 1976/1979
- The Common Rule: [Title 45, Part 46 of the Code of Federal Regulations: Protection of Human Subjects](#).
 - Informed consent

Readings for Thursday

- [The Belmont Report](#)
- [Lundberg, Ian, et al. "Privacy, ethics, and data access: A case study of the Fragile Families Challenge." Socius 5 \(2019\)](#)
 - Modern example of applying principles from the Belmont Report (and elsewhere) in AI research
 - Focus on data protections
- Post 2-paragraph response on Piazza by 5pm tomorrow!