computational social media

lecture 8: society

daniel gatica-perez
announcements

assignment #4 will be discussed today

reading #9 & reading #10 will be presented today

A. Birhane, and V. Uday Prabhu
Large Image Datasets: A Pyrrhic Win for Computer Vision?

K. Yang, K. Qinami, L. Fei.-Fei, J. Deng, and O. Russakovsky
Towards Fairer Datasets: Filtering and Balancing the Distribution of the People Subtree in the ImageNet Hierarchy
reminder: project presentation day
friday 11.06.2021 on zoom (same link as lectures)

09:00-09:45  group 1
09:45-10:30  group 2
10:30-10:45  break
10:45-11:30  group 3
11:30-12:15  group 4

12:15-13:00  lunch break

13:00-13:45  group 5
13:45-14:30  group 6
14:30-14:45  break
14:45-15:30  group 7
15:30-16:15  group 8

+ everybody is encouraged to attend the full day
+ please reserve the slot for your team
projects

presentation
- each team has a 45-min slot: 25 min talk + 20 min for questions
- all team members are expected to present
- structure: intro, goals, data, methods, results & discussion, conclusion
- make each team member’s contribution explicit (who did what)
- include lessons learned

report
- ACM conference paper format:
  6 double-column pages + references + appendices (if needed)
- latex template available (ask your project mentor in case of questions): [https://www.acm.org/publications/proceedings-template](https://www.acm.org/publications/proceedings-template)
- structure: abstract, introduction (including goals), data, methods, results & discussion, conclusion, references
- collaborative tools like overleaf are useful
- submit slides & report by **18.06.2021, 7pm**
this lecture

1. introduction
2. the world is big
3. open issues
1. introduction
We shape our tools, and thereafter our tools shape us

Marshall McLuhan, media theorist, 1960s
“Americans are highly concerned about the effects of “fake news” on democracy, … They are concerned about the role that tech companies plays in news,”
this lecture

1. introduction
2. the world is big
3. open issues
2. the world is big
Twitter is not everybody
Representative survey of US adult Twitter users (N=2791)

Twitter users are younger, more highly educated and wealthier than general public

% of _____ who are ...

AGE
18-29
21
29
30-49
33
44
50-64
19
26
65+
8
20

EDUCATION
Less than high school
4
10
High school graduate
31
54
College graduate+
42

INCOME
<$30,000
23
30
$30-$74,999
33
36
$75,000+
32
41

GENDER
Women
50
52
Men
48
50

https://www.pewresearch.org/internet/2019/04/24/sizing-up-twitter-users/
25 largest urban areas in the world

1. Tokyo-Yokohama
2. Jakarta
3. Delhi
4. Manila
5. Seoul-Incheon
6. Shanghai
7. Mumbai
8. New York City
9. Beijing
10. Sao Paolo
11. Mexico City
12. Guangzhou–Foshan
13. Dhaka
14. Osaka-Kobe-Kyoto
15. Moscow
16. Cairo
17. Bangkok
18. Los Angeles
20. Kolkata
21. Istanbul
22. Tehran
23. Lagos
24. Tianjin
25. Karachi

5 are in the “Global North”
20 in the rest of the world
4 in China
3 in India

https://en.wikipedia.org/wiki/List_of_urban_areas_by_population
“Digital humanitarians are volunteers and professionals from the world over…. In real-time, they make sense of vast volumes of social media and imagery captured from satellites and UAVs to support relief efforts worldwide. They craft and leverage ingenious crowdsourcing solutions with insights from AI.”

What about everyday life phenomena?
Platform that uses mobile & social to crowdsource transit reports

Aggregates citizen reports (Twitter & app)

Reports consist mainly of text and images. Users use road names and other well known landmarks to locate their reports

Strong local community: over 1M Twitter followers
## topic modeling

<table>
<thead>
<tr>
<th>Topic</th>
<th>Most Relevant Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>sacco, matatus, driver, embassava, passeng, wrong, bus, shame, reckless, loud, suspend</td>
</tr>
<tr>
<td>T2</td>
<td>police, fire, bribe, offic, traffic, cop, fuel, light, car, arrest, collect, motorist, law, corrupt</td>
</tr>
<tr>
<td>T3</td>
<td>obama, road, close, mombasa, day, friday, nairobi, time, grass, uhuru, visit, kidero</td>
</tr>
<tr>
<td>T4</td>
<td>accid, involv, car, lorri, caus, hit, road, truck, bypass, polic, dead, injury, scene, bus</td>
</tr>
<tr>
<td>T5</td>
<td>drive, speed, safeti, cross, pedestrian, #zushaleo, safe, road, limit, life, #trafficwatch, drink</td>
</tr>
</tbody>
</table>

Matatus (minibuses)

Police issues

Obama’s visit

Accidents

Safety advice
Nairobi’s traffic as seen by machines

Top-10 object categories extracted from Ma3Route images (ImageNet pre-trained CNN)
large-scale image sources are not representative

Figure 1: Fraction of Open Images and ImageNet images from each country. In both data sets, top represented locations include the US and Great Britain. Countries are represented by their two-letter ISO country codes.

measuring the impact of geographical bias

"Images of household items across the world, and classes recognized by commercial image-recognition systems. Systems tend to perform worse in non-Western countries and for households with lower incomes".

measuring the impact of geographical bias (2)

“The Dollar Street image dataset was collected with the goal of making ‘everyday life on different income levels understandable’: 135 different classes taken in 264 homes across 54 countries.”

“Average accuracy (and sd) of six object recognition systems vs. normalized income of household where images were collected”

Avoiding the South Side and the Suburbs: The Geography of Mobile Crowdsourcing Markets

Jacob Thebault-Spieker
GroupLens Research
University of Minnesota
thebault@cs.umn.edu

Loren Terveen
GroupLens Research
University of Minnesota
terveen@cs.umn.edu

Brent Hecht
GroupLens Research
University of Minnesota
bhecht@cs.umn.edu

Characterizing Dietary Choices, Nutrition, and Language in Food Deserts via Social Media

Munmun De Choudhury
College of Computing
Georgia Tech
munmund@gatech.edu

Sanket Sharma
College of Computing
Georgia Tech
sanket@gatech.edu

Emre Kiciman
CLUES Group
Microsoft Research
emrek@microsoft.com

ACM CSCW 2015

ACM CSCW 2016
<table>
<thead>
<tr>
<th>WEST</th>
<th>CHINA</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="https://www.imd.org/research-knowledge/articles/the-chinese-digital-giants-coming-to-a-store-near-you/" alt="Facebook logo" /></td>
<td>Tencent 腾讯</td>
</tr>
<tr>
<td>Tencent is top shareholder of JD.com</td>
<td></td>
</tr>
<tr>
<td><img src="https://www.imd.org/research-knowledge/articles/the-chinese-digital-giants-coming-to-a-store-near-you/" alt="Google logo" /></td>
<td>Baidu 百度</td>
</tr>
<tr>
<td>Baidu owns iQiyi, Alibaba owns Youku, Tencent owns QQ video</td>
<td></td>
</tr>
<tr>
<td><img src="https://www.imd.org/research-knowledge/articles/the-chinese-digital-giants-coming-to-a-store-near-you/" alt="Twitter logo" /></td>
<td><img src="https://www.imd.org/research-knowledge/articles/the-chinese-digital-giants-coming-to-a-store-near-you/" alt="Weibo logo" /></td>
</tr>
<tr>
<td>Alibaba has 31.5% stake</td>
<td></td>
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</tbody>
</table>
| ![Uber logo](https://www.imd.org/research-knowledge/articles/the-chinese-digital-giants-coming-to-a-store-near-you/) | 滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴滴
“The AI world order will combine winner-take-all economics with an unprecedented concentration of wealth in the hands of a few companies in China and the United States. This, I believe, is the real underlying threat posed by artificial intelligence (p.21)”

Kai-Fu Lee

2018
this lecture

1. introduction
2. the world is big
3. open issues
3. open issues: misinformation, accountability, fairness, equity
AI will solve Facebook’s most vexing problems, Mark Zuckerberg says. Just don’t ask when or how.

By Drew Harwell
April 11, 2018

Google CEO: A.I. is more important than fire or electricity

Published Thu, Feb 1 2018 • 12:56 PM EST
machine learning moved from the {objective, physical, binary, certain} to the {subjective, psychological, nuanced, uncertain}
misinformation

CAN MARK ZUCKERBERG FIX FACEBOOK BEFORE IT BREAKS DEMOCRACY?

Facebook: 2B+ users
Instagram: 1B+ users
Whatsapp: 2B users
accountability

28.06 2015

Google Photos, y'all fucked up. My friend's not a gorilla.

https://www.wnycstudios.org/podcasts/notetoself/episodes/deep-problem-deep-learning
accountability, transparency, fairness

**accountability**
- companies should be responsible for their practices involving machine learning algorithms should be auditable

**transparency**
- people should know how machine decisions are made and where/how in the process their data is used

**fairness**
- machines should be trained to give people the same chances and avoid discrimination

"Data Feminism offers strategies for data scientists seeking to learn how feminism can help them work toward justice, and for feminists who want to focus their efforts on the growing field of data science. But Data Feminism is about much more than gender. It is about power, about who has it and who doesn't, and about how those differentials of power can be challenged and changed."

7 principles
“Examine power
Challenge power
Rethink binaries & hierarchies
Elevate emotion & embodiment
Embrace pluralism
Consider context
Make labor visible”

C. D'Ignazio & L. F. Klein, Data Feminism, MIT Press, 2020
Online reading group: https://www.youtube.com/channel/UCXZQjnQdT6nyYBFU/XW8elQ
who should get involved?
who should get involved? companies

Oversight Board

Announcing the First Members of the Oversight Board

May 06, 2020

As its community grew to more than 2 billion people, it became increasingly clear to the Facebook company that it shouldn’t be making so many decisions about speech and online safety on its own. The Oversight Board was created to help Facebook answer some of the most difficult questions around freedom of expression online: what to take down, what to leave up, and why.

The board uses its independent judgment to support people’s right to free expression and ensure those rights are being adequately respected. The board’s decisions to uphold or reverse Facebook’s content decisions will be binding, meaning Facebook will have to implement them, unless doing so could violate the law.
Machine Learning Fairness

As an AI-first company, Google aims to develop the benefits of machine learning for everyone.

Building inclusive machine learning algorithms is crucial to help make the world's information universally useful and accessible. Google researchers are working in this area,

https://developers.google.com/machine-learning/fairness-overview
Think fairness. Build for everyone.
A toolkit to assess and improve the fairness of machine learning models.

Assess          Mitigate

Use common fairness metrics and an interactive dashboard to assess which groups of people may be negatively impacted.

Get Started   API Docs

https://fairlearn.github.io/
https://github.com/fairlearn/fairlearn
who should get involved? governments

European General Data Protection Regulation (GDPR)

“(71) The data subject should have the right not to be subject to a decision, which may include a measure, evaluating personal aspects relating to him or her which is based solely on automated processing and which produces legal effects concerning him or her or similarly significantly affects him or her, such as automatic refusal of an online credit application or e-recruiting practices without any human intervention […] In any case, such processing should be subject to suitable safeguards, which should include specific information to the data subject and the right to obtain human intervention, to express his or her point of view, to obtain an explanation of the decision reached after such assessment and to challenge the decision. “
Google protests 'eye-catching' $2.6 billion EU fine, judge disagrees

LUXEMBOURG (Reuters) - Google on Friday attacked what it called an eye-catching 2.4 billion euro ($2.6 billion) EU antitrust fine, prompting a judge to ask how a rich company can miss a relatively paltry amount.
Social media platforms must be held accountable for the hate speech & disininformation we see online – and if they don’t step up, there will be consequences. We launched Canada’s new Digital Charter today to guide our decisions, learn more about it here: bit.ly/2YGiTuu

The platforms are failing their users. And they’re failing our citizens.
who should get involved?
engineers, scholars, civil society

“Governments need to regulate AI by expanding the powers of sector-specific agencies to oversee, audit, and monitor technologies by domain.

The AI industry needs new approaches to governance. Internal governance structures at most technology companies are failing to ensure accountability for AI systems.

Fairness, accountability, and transparency in AI require a detailed account of the ‘full stack supply chain’.

Consumer protection agencies should apply “truth-in-advertising” laws to AI products and services.

University AI programs should expand beyond computer science and engineering disciplines.”

what to do?
A. Birhane, and V. Uday Prabhu
Large Image Datasets: A Pyrrhic Win for Computer Vision?

K. Yang, K. Qinami, L. Fei.-Fei, J. Deng, and O. Russakovsky Towards Fairer Datasets: Filtering and Balancing the Distribution of the People Subtree in the ImageNet Hierarchy
#2: action lists for crowdsourced labor

<table>
<thead>
<tr>
<th>Technical Fixes</th>
<th>Social Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>communication</strong>: provide APIs to facilitate communication among workers</td>
<td><strong>accountability</strong>: pledge to work with vendors that guarantee “good work code”</td>
</tr>
<tr>
<td><strong>networking</strong>: create a professional network to build communities among workers</td>
<td><strong>categorization</strong>: define job categories that properly reflect crowdwork</td>
</tr>
<tr>
<td><strong>collaboration</strong>: enable “flash teams” for full pipeline of work, including content moderation</td>
<td><strong>recognition</strong>: create third-party registry for crowdworkers to build resumes and reputation</td>
</tr>
</tbody>
</table>

#3: checklists for fairness in AI systems

“Iterative co-design process with 48 practitioners from 12 tech companies, working on 37 products & services (interviews and workshops)”

“Co-designed an AI fairness checklist”

“Practitioners believe that checklists provide organizational infrastructure for formalizing ad-hoc processes and empowering individual advocates, but only if they are aligned with teams’ existing workflows and supported by organizational culture.”

M. Madaio, L. Stark, J. Wortman Vaughan, H. Wallach, Co-Designing Checklists to Understand Organizational Challenges and Opportunities around Fairness in AI, ACM CHI, Mar. 2020
the checklist:
envision; define; prototype; build; launch; evolve

Envision
Consider doing the following items in moments like:
- Envisioning meetings
- Pre-mortem screenings
- Product greenlighting meetings

1.1 Envision system and scrutinize system vision
1.1.a Envision system and its role in society, considering:
- System purpose, including key objectives and intended uses or applications
  - Consider whether the system should exist and, if so, whether the system should use AI
- Sensitive, premature, dual, or adversarial uses or applications
  - Consider whether the system will impact human rights
  - Consider whether these uses or applications should be prohibited
- Expected deployment contexts (e.g., geographic regions, time periods)
- Expected stakeholders (e.g., people who will make decisions about system adoption, people who will use the system, people who will be directly or indirectly affected by the system, society), including demographic groups (e.g., by race, gender, age, disability status, skin tone, and their intersections)
- Expected benefits for each stakeholder group, including demographic groups
- Relevant regulations, standards, guidelines, policies, etc.

1.1.b Scrutinize resulting system vision for potential fairness-related harms to stakeholder groups, considering:
- Types of harm (e.g., allocation, quality of service, stereotyping, denigration, over- or underrepresentation)
- Tradeoffs between expected benefits and potential harms for different stakeholder groups
  - Consider who the system will give power to and who it will take power from
  - Consider which expected benefits you are willing to sacrifice to mitigate potential harms

1.1.c Revise system vision to mitigate any potential harms; if this is not possible, document why, along with future mitigation or contingency plans, etc., and consider aborting development

1.2 Solicit input and concerns on system vision
1.2.a Solicit input on system vision and potential fairness-related harms from diverse perspectives, including:
- Members of stakeholder groups, including demographic groups
  - Consider whether any stakeholder groups would prefer that the system not exist or not be deployed in all contexts, what alternatives they would prefer, and why
final remarks

the world is big
be wary of limited machine representations of the world
think about underlying assumptions in social data & models
think about who should benefit from technology
think about implications
take action

as EPFL engineers
you have a role to play on the
technology / ethics / geography
Driving social media in the machine learning age
thank you

daniel.gatica-perez@epfl.ch