Thinking about Ethics in (Computer) Science

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23 March 2022

Who are we?

Susana

Computational Neuroscience PhD student, I make computer models of molecules in our brain. Interested in creating an ethical and reproducible PhD project.

David

Computational Neuroscientist and University Teacher in the School of Informatics, teaching and supervising data science students.

Melanie

Computational Neuroscience PI. Teaching students in biomedical sciences and biomedical informatics.

What are we going to talk about?

- Susana: personal experience and bias in science.
- David: example of talking ethics in Informatics.
- Melanie: example of safe space in biomedical sciences.

Disclaimer for self care

I hope you can just take what's useful, and leave, critique, augment or redefine areas based on your own knowledge and experience, and that in any case, it can be a springboard for or contribution to discussion: an addition to the polyphony already in dialogue about this terrain. I hope it can be part of fostering solidarity, deep interconnectivity, collective care, transformation and healing.

Warp and Weft: Psychoemotional health, politics and experience, Lisa Fennen.

Strong division in my life: Scientific World vs Real World

- <u>Scientific World</u>: learning about biology, maths, physics. Sitting in front of my laptop coding computer models and reading research as cold hearted, rational facts.

- <u>Real World</u>: learning about social issues, philosophy, capitalism, oppression, politics and also love, activism, ancient knowledge of the land.

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- Why can't we bring political ideas, emotions and social awareness into the research that we do? If it's already biased anyway!
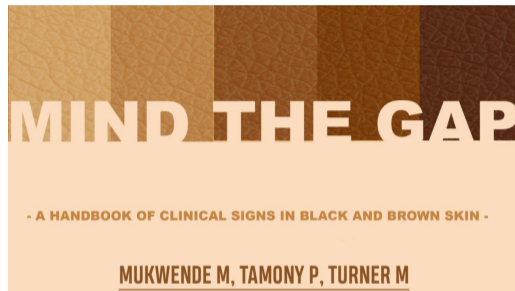
Why do I care?

- I have personally experienced oppression.
- I have certain privileges too.
- I am biased and therefore could bring bias to the research that I do, if I avoid thinking about ethics and politics in my research.

Examples of bias in science: <u>Racism</u>

- Images being shown in clinical skills sessions are not representative of people with darker skin tones.
- If the doctors of tomorrow are better equipped to deal with how signs and symptoms present on black and brown skin, this will improve patient care and reduce the healthcare disparities that exist today.


MIND THE GAP

- A HANDBOOK OF CLINICAL SIGNS IN BLACK AND BROWN SKIN -

<u>MUKWENDE M</u>, <u>TAMONY P</u>, <u>TURNER M</u>

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Racism and Sexism

- Google search for "Black girls", "Latina girls", "Asian girls" "— what will you find?
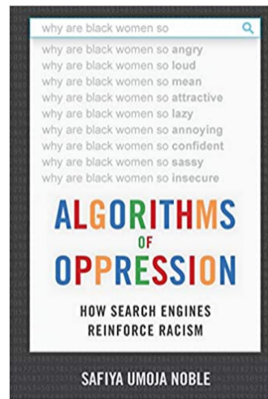
Racism and Sexism

- Google search for "Black girls", "Latina girls", "Asian girls" "— what will you find?
- Sexually explicit terms are likely to come up as top search terms.
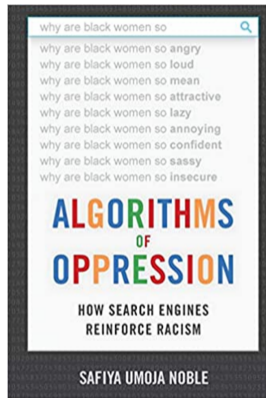
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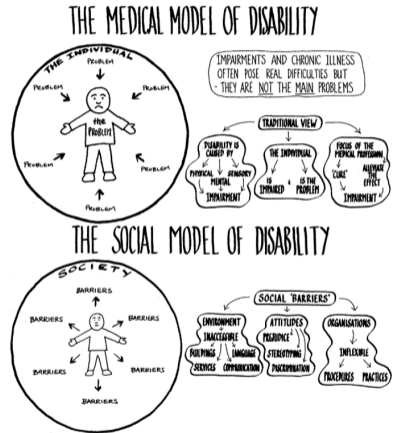- But, if you type in "white girls," the results are radically different.
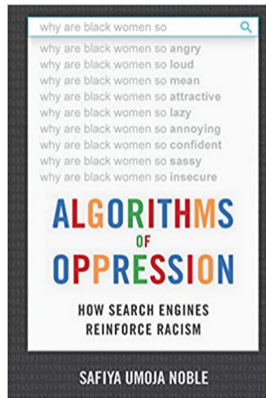
Ableism

- Approaches to diagnosis of ADHD, autism, dyslexia, hearing difficulties and many more has often been to hyper-focus on fixing what was perceived as "broken".

Speciesism

You CANNOT

RESPECTFULLY,
COMPASSIONATELY,
HUMANELY

EXPLOIT,
OPPRESS,
KILL

SOMEONE.

3Rs: providing a framework for performing more "humane" animal research

	Standard	Contemporary
Replacement	Methods which avoid or replace the use of animals	Accelerating the development and use of models and tools, based on the latest science and technologies, to address important scientific questions without the use of animals
Reduction	Methods which minimise the number of animals used per experiment	Appropriately designed and analysed animal experiments that are robust and reproducible, and truly add to the knowledge base
Refinement	Methods which minimise animal suffering and improve welfare	Advancing animal welfare by exploiting the latest *in vivo* technologies and by improving understanding of the impact of welfare on scientific outcomes

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But we are already doing so much!

Three suggestions for thinking Ethics in Science

- 1) Think about the bias you are potentially bringing into your research.
  - Humans are biased by the knowledge we carry, our social upbringing, and our political ideas.
  - Unless brought to light, continue to disproportionately affect some more than others.
- 2) Think about ethics of your data.
  - Where does the data we use come from?
  - Who was behind our data? They were not just numbers.
  - How much energy are we using with our super-computers?
- 3) Offer safe spaces to talk about these topics.

What can safe spaces look like?

- Spoiler Alert: No single answer!
- Start from a place of openness to new ideas and experiences
- Set respectful boundaries – allow the other person to say if they are not comfortable with something, or if **you** feel uncomfortable with something.
- Disclaimers are a good way to set up explicitly that people are safe to share views in respectful ways.

What can safe spaces look like?

- Two basic options for discussing ethics in the curriculum:
  - Schedule a series of explicit class periods to be devoted to ethics or
  - Design syllabus with enough "slack" to handle ethical questions as they arise "on the fly."
- Enabling a safe space can look like asking and enabling discussions around "difficult/emotional" topics within any conversation, class or research discussion.

What can safe spaces look like?

- For some practical examples, have a look at:
  - Staff Student Solidarity Network (SSSN).
  - Decolonising economics group.
  - The Turing Way handbook to reproducible, ethical and collaborative data science.
  - Data Ethics Club by Data Hazards Group

Talking Ethics in Informatics

- 2nd year computer science course for 300 students
- Embedded EthiCS principle: ethics is embedded in the course, not just in the final lecture

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- I'm not an ethicist get me out of here! But ethics isn't rocket science (Smith 2014, *J Microbiol Biol Educ* 15:202)

- Aim: Develop **ethical sensitivity** and **ethical reasoning**

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informatics

FOUNDATIONS OF DATA SCIENCE

Talking Ethics in Informatics

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  - Facebook's emotion manipulation experiment (informed consent)
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- Questions on ethics and law in class tests and coursework

Teaching ethics in Biomedial Sciences 1

- Year 1 Biomedical Sciences course at Zhejiang University-University of Edinburgh in Haining, China.

- Ethics module developed by Dr. Chris Wood.

Creating a space where students feel comfortable talking about ethics

Photo by Agoston Tyll and Yuuki Guzman, OIST, 2015

Creating a space where students feel comfortable talking about ethics

- Students have had an introductory ethics lecture
- Present a dilemma (e.g. from Medscape Top 20 Physician Dilemmas)
- Students close their eyes
- Say "hm" if they agree

Photo by Mikail Duran on Unsplash

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Creating a space where students feel comfortable talking about ethics

Let's try it!

Should it be legal for people to buy organs for transplant, if they would not be able to receive an organ by waiting their turn through the national database?

- Yes

- No

- It depends

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Creating a space where students feel comfortable talking about ethics

Photo by Yuuki Guzman, OIST, 2016

Follow-up:

- Classroom discussion to clarify (for those who feel comfortable doing so)
- Show results from a physician survey in the US - numerical or (better!) example free text answers
- Link to ethical frameworks discussed in lecture
- Debate assignment with randomly allocated positions

Thank you | Any questions?

Feel free to email Susana on s1350728@sms.ed.ac.uk

References and Resources

- Warp and Weft: Psychoemotional health, politics and Experience, Lisa Fennen
- Color film was built for white people
- Skin color in dermatology textbooks: An updated evaluation and analysis
- Mind the Gap handbook, available to download here
- Algorithms of oppression, Safiya Umoja Noble.
- Medical vs Social Models of Disability

References and Resources

- 3Rs - Good articles to read:
  - The 3Rs Principle – Mind the Ethical Gap!
  - Researchers' attitudes to the 3Rs—An upturned hierarchy?
- Ethics Is Not Rocket Science: How to Have Ethical Discussions in Your Science Class
- Embedded EthiCS: Integrating Ethics Across CS Education
- Staff Student Solidarity Network (SSSN).
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