unbAIsed: reducing bias in AI for healthcare [Session plan]

Goal:

- Raise awareness about inequalities in the biomedical and AI fields and the negative consequences of the lack of diversity in biomedical data.
- Explore how AI can be used to reduce disparities in healthcare.

Resources

- Schedule & script
- Contact form
- Session presentation
- Miro board

Description:
AI has an astonishing potential to assist clinical decision-making and revolutionize global health. However, this can only be possible if the use of AI in healthcare takes into account the needs of diverse populations. If the training data is misrepresentative of the population variability, AI is prone to reinforcing inequality and bias, which can lead to injustices in healthcare, making already vulnerable patients more susceptible to fatal outcomes and misdiagnoses.

In this session, we'll target some of the main challenges that need to be addressed in order to move towards fairness in AI for healthcare, including gender and racial bias, data gaps, and ethical concerns. Participants will be divided into breakout groups, where they will have the opportunity to brainstorm recommendations to solve these challenges. We will also explore how AI can help make invisible minorities visible and reduce inequalities in healthcare. Participants will be encouraged to target how open practices (data/code sharing, open & participatory science) can be used to reduce inequalities and improve global health.

Session plan:
5 minutes: Introduction(Active)

- Invite participants to introduce themselves: Name + pronouns + Country.

10 minutes: Introducing the session (Passive)

- Use two slides to introduce AI in healthcare in Real life. In here, we will show several article headlines and quotes that refer to biased algorithms causing discrimination and misdiagnosis and run through several examples, targeting human (racial and gender) and algorithic bias.
    - Example for gender bias: Compared to men, women are more likely to have their pain levels underestimated by clinicians (Calderone, 1990), and are likely to receive less analgesia for injuries (Michael et al., 2007).

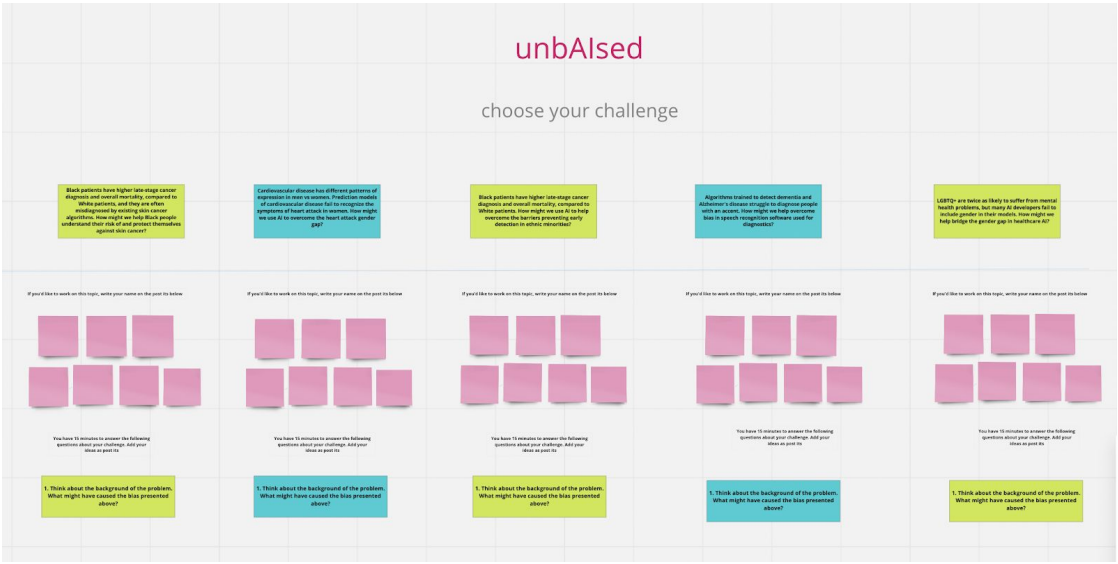
    - Example for racial bias: Ethnic minorities experiencing more severe symptoms and receiving less often medication than White patients (Vyas et al., 2020) | Black patients have higher late-stage cancer diagnosis and overall mortality, compared to White patients (Poulson et al., 2021).
- Talk about data-driven bias and invisible minorities - how AI IRL fails to represent their needs.
- Talk about we need new technologies that put minorities at the center of their design, and are created to solve world pressing issues such as immigration, access to healthcare services, and racial and gender gaps.

15 minutes: Breakout rooms (Active)

- Prior to the session, participants will have the opportunity to find a key area of interest they'd like to focus on during the breakout rooms. The areas of interests proposed are
    - Gender bias
    - Racial bias
    - Data-driven bias
- For each area, they will be invited to choose a question that can be solved with artificial intelligence in the area they chose. The questions are:
    - Black patients have higher late-stage cancer diagnosis and overall mortality, compared to White patients, and they are often misdiagnosed by existing skin cancer algorithms. How might we help Black people understand their risk of and protect themselves against skin cancer?
    - Cardiovascular disease has different patterns of expression in men vs women. Prediction models of cardiovascular disease fail to recognize the symptoms of heart attack in women. How might we use AI to overcome the heart attack gender gap?
    - Black patients have higher late-stage cancer diagnosis and overall mortality, compared to White patients. How might we use AI to help overcome the barriers preventing early detection in ethnic minorities?
    - Algorithms trained to detect dementia and Alzheimer's disease struggle to diagnose people with an accent. How might we help overcome bias in speech recognition software used for diagnostics?
    - LGBTQ+ are twice as likely to suffer from mental health problems, but many AI developers fail to include gender in their models. How might we help bridge the gender gap in healthcare AI?
- Participants will be guided through the design process and prompted to think about the main challenges AI creators face when designing new technologies: The prompt questions to guide the discussion are:
    - Think about the background of the problem. What might have caused the bias presented above?
    - Who are you designing for, what is your population of interest?
    - What barriers might you face in the data collection process?
    - Are there any ethical implications you should consider(privacy, access, data protection)?

    - What are your ideas & solutions? What would you need to bring them to life?

- They will share their ideas using Miro, and will share back the output of the breakout room with the rest of the session attendees. Miro template below:



15 minutes: Discussion (all attendees)

- Everyone will come back to the main group, where volunteers from the breakout groups will summarize the key points of their discussion with the rest of the attendees. Each of the groups will have a couple of minutes to explain their results.

10 minutes: Our research

- Athina will use this time to explain our current research and a flash summary of the research paper we wrote, as well as our future plans. Contact forms will be send to potential collaborators.

5 minutes: Questions & closing remarks

- We will answer any questions that come up regarding our work.
- During this time, participants will be given a form for them to write their email details so that they can keep in touch with us and receive updates. This will be particularly interesting for us to find feedback for our research paper draft.

After the session

1. Sharing is caring
   Share the session outcomes on your social media profile or with anyone who might be interested if you want!
2. Email the participants and ask for feedback.