Food for Thought:

How does Algorithm Bias affect the world, and why does it matter?

How can we become better, more ethical coders when it comes to machine learning algorithms?

Machine Bias:

What Is It?

Machine bias is defined as the oftentimes unintended algorithmic preference for one prediction over another that results in legally or ethically inappropriate implications. i.e. machine bias is programming that assumes the prejudice of its creators or data

Examples:

- Joy Buowamlini who used facial recognition software to write a program that can't recognize her face exists.
- A City University of New York study that found that based upon google algorithms, men are six times more likely to be shown high paying job ads than women.
- In July 2015, Jacky Alcine posted to Twitter a Google Photo that used facial recognition to tag him and another friend as gorillas

How does it happen?

- Can inherit the bias of the humans writing the code.
- Can "learn" human biases from data. (ex. word association)

Why does it matter?

The ubiquity of autonomous machines in our world means algorithmic decisions affect nearly every aspect of our lives.

- What ads are shown, Who gets a loan
- As many machine learning and AI experts say "*garbage in, garbage out.*" Without a sufficiently effective algorithm and representative data to train on, a machine learning model will lead to inacurate and sometimes even harmful results.

What can we do?

There are three primary questions we must ask when bias results from a machine learning algorithm:

1. How is the model made?
2. How is it used?
3. What ethical considerations are in place?

Possible Solutions:

- Technical Solutions: Reduce variance by using softer splits in a Markov Tree model. Use multiple hypotheses for classification problems. Perform external validation testing by experimenting with different data sets and metrics. Machine Learning code should be transparent or open source.
- Political Solutions: Overall, creating policies and standards can help reduce the effects of ML bias. For example, the EU passed the General Data Protection Regulation (GDPR) which means that when an algorithmic decision is made about a person, he or she has a right to know why.
- Social Solutions: Increase diversity in talent and implement community policing. Crowdsourcing ethics and involvement of people from various populations can also decrease algorithmic bias.
- Philosophical Solutions: Training from human ethicists instead of solely relying on an average human when making moral decisions. Conducting further research on building more complex machines that are "innately ethical".

Are you interested in doing more?

Look into the algorithmic justice league, a movement towards equitable and accountable AI

https://www.ajlunited.org/

Resources

https://www.youtube.com/watch?v=UG_X_7g63rY

https://academicworks.cuny.edu/cgi/viewcontent.cgi?article=1042&context=jj_etds