Introduction

I always say to my students “you are going to be the future data science leaders of the world”. Wherever they end up, I hope they apply critical (Cotter, 2020; Dasgupta & Hill, 2020) and human-centered (Xu, 2019) thinking to the AI decisions they make. As AI algorithms become ever more omnipresent in our lives – from newsfeed organization to product recommendations and beyond – it is our responsibility as educators to equip our students with the necessary tools to interrogate the impacts of AI technology. Luckily, there has been a large push for the integration of ethics into AI curricula. Whether this is in Model AI assignments (Furey & Martin, 2019) or entire conferences (such as FAccT), there is a demand for integrated and critical algorithmic literacies both in the classroom and outside of it.

As a social media researcher and AI educator, my work regularly contends with two pillars: Joy and Justice. In this article I intend to outline ways of integrating both play and critical interrogation into AI education, with examples from AI education scholarship (Druga, Vu, Likhith, & Qiu, 2019; Ko et al., 2020) as well as a light experience report highlighting student work. My students join me on this article as they are the main inspiration for innovative joy and justice practices!

Joy

Computing can be filled with joy. We create games (Neller, 2019), robots (Dodds, Greenwald, Howard, Tejada, & Weinberg, 2006; Williams, Kaputsos, & Breazeal, 2021), books (Liukas, 2015), and whole languages (Maloney, Resnick, Rusk, Silverman, & Eastmond, 2010) centered around computing and play. Constructionism (Papert, 2020) has guided computing education in countless ways. AI education specifically has exploded with lessons and tools that center on joy and playfulness: (Giannakos, Voulgari, Papavlasopoulou, Papamitsiou, & Yannakakis, 2020; Fiebrink, 2019; Huppenkothen & Eadie, 2021). Play can span all ages, and is not just for children. One only needs to think of social media face filters to recognize the abundance of AI-mediated play at any age.

Justice

Computing can be centered around justice. AI technology in particular is used across industries that affect human lives: such as medicine, law, education, finance, and media (Chui et al., 2018). Recent years have shown increased interest in quantifying, discussing, and remediating AI bias and algorithmic harm (Kordzadeh & Ghasemaghaei, 2021). As we continue to work on combating algorithmic bias, as well as questioning what algorithmic systems should even be produced, we are also grappling with how to teach these critical skills in the AI classroom. (Ali, Payne, Williams, Park, & Breazeal, 2019) has demonstrated several activities for ethical AI that include: students creating an ethical matrix for a YouTube Recommendation algorithm as well as discussing bias in facial recognition (Buolamwini & Gebru, 2018).

Computing education academics, large tech companies (e.g. Google PAIR), and corporate training programs are continuing to explore ways to integrate justice-oriented concepts into AI education – and it is imperative that all AI education grapples with the impacts of algorithms on human lives (Borenstein & Howard, 2021).

Model AI Assignment: Zombie KNN

Our recent Model AI assignment attempted to integrate both joy and justice into a zombie apocalypse themed lesson on the algorithm k-nearest neighbors. Equipped with a map and
“data radioed in from the nearby town”, middle school students try to compute where zombies tend to congregate – in order to ensure safe passage through the variety of locations on the map. Given data from the nearby town, students try to determine the most similar locations in their own town, and draw inferences about the likely number of zombies assembled there. The lesson pivots to questions of accuracy and the risks of ‘getting it wrong’. What if there are 2 zombies where you predicted 1? What if there are 100 where you predicted 1? What are the costs and risks of a wrong prediction? The lesson then engages students in thinking about medical AI decisions, and encourages students to think critically around accuracy thresholds and certainty, as well as potential consequences and benefits of prediction.

Master’s Level Final Project: Choose Your Own Adventure

I designed the final project for the Information Management Master’s course on Machine Learning and Econometrics, titled: **Choose Your Own Adventure**, a play on books and video games where an individual chooses their own path in a series of decisions. Students choose an algorithm, a dataset, a research question, and a visualization – all culminating in an analysis of how their project might be used for good in the world, and how it may be misused and lead to harm. Students engaged in a wide variety of disciplines, and I provide some examples of their work below:

- Computing a walkability score around the city using satellite images: “these models don’t generalize to everyone, and there could be poor representation for children, disabled people, and the elderly. We need to adjust the model to be more inclusive and specifically serve their needs”
- Automatically detecting levels of fentanyl in a blood sample: “it doesn’t take into account the socioeconomic factors that facilitate fatal drug use. It’s not just the fentanyl. Mental illness is not a binary either. There needs to be a more nuanced view of mental wellness and addiction”
- Heart disease detection: “there is a long standing history of medical studies only collecting health data from white males. This can be highly consequential for diagnosis and treatment. It is vital these datasets are more representative”
- Product recommendation: “we do mess with the user’s thought process by making them think they NEED a particular product when in fact it’s just the result of targeted marketing”

Conclusion

As we continue to find more use cases for AI technology, we are also discovering new evidence of bias impacting stakeholders of these models. As educators, we can carefully guide our students to critically interrogate any AI use case, from the overall design to the details of interpreting the F1 score. I join other AI educators in finding creative ways to celebrate the joy of computing while remaining justice-oriented at the core. “Because we can” transforms into “Because it matters”.

References


Yim Register is a PhD candidate at UW. They study how users resist algorithmic harm on social media, and how AI educators can prepare students to create more inclusive and trauma-informed AI projects.

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