Designing an AI Literacy Transformational Game for Families

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CCS CONCEPTS

• **Social and professional topics** → **Computing literacy**; **Computing education**; **Informal education**; • **Human-centered computing** → **Human computer interaction (HCI)**.

KEYWORDS

AI literacy, transformational games, design, families, youth

Background

With the rise of AI-driven technologies that impact youth as stakeholders, there's a need for AI literacy, which includes both technical (e.g., training data) and socio-technical topics (e.g., algorithmic bias) [2, 3]. Since this is a youth-facing matter, it is also a family-facing matter. In this work, we asked: **How can a game be designed to support youth and families in learning about ML and algorithmic bias?** We iteratively designed a transformational game to foster youth and families' AI literacy, which we saw fitting for discussing technical and serious topics with youth.

We took a design-based research approach, reflecting on qualitative data from playtesting at workshops in an out-of-school context. We held a workshop with 7 children (ages 9-12), and then three families (3 parents and 6 children, ages 9-13).

In this game, Player 1 has a set of 'training data' cards with images of animals and creates a secret rule to sort them into two piles, for example, "animals with floppy ears." Player 2 is given 5 cards of 'testing data.' Player 2 places these cards into which sorted pile they think the cards belong to, receiving feedback each time on whether they are correct. Player 2 then guesses the secret rule based on what they have learned from test data. Nuance arises when players disagree on how certain cards are sorted, realizing how bias can be a part of ML.

Findings

Persuasive design to approach serious topics. Our game explored the principle of distancing to make the topic of bias more approachable; it first featured dogs affected by AI bias instead of humans [1]. However, we found that dogs were *too* distant from players' experiences. One participant drew parallels between sorting the dogs and being separated by gender in school, which was *"very much not fair,"* but all other youth were unable to see how the game related to bias. To still achieve distancing but allow for more direct translation, we changed our game characters to anthropomorphic animal characters instead of dogs. Based on observations during gameplay, we found that youth were then able to understand and apply the knowledge related to ML and bias more broadly.

Enabling understanding through family collaboration. Our game approach allowed families to discuss serious and complex topics like bias together. Parents provided additional scaffolding concepts related to the complexities of bias during gameplay. Additionally, 4 participants in the youth-only group expressed that they would recommend playing this game with their families. Through the combination of the family environment and anthropomorphic characters during the final workshop, we observed that youth were able to grasp the nuance in data labeling and its impacts on creating AI bias.

Conclusion

In summary, we found that transformational games using persuasive design techniques can be an effective way to support learning about ML and algorithmic bias, particularly in a family setting. Future work could further explore ways for families to playfully learn about and make sense of AI, including new frontiers of AI like generative AI.

ACKNOWLEDGMENTS

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