Preface to the Proceedings of the Human-Centric eXplainable AI in Education Workshop (HEXED 2024)⋆

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1. Introduction

The HEXED 2024 workshop (https://hexed-workshop.github.io) is the first workshop entirely dedicated to the advancement of eXplainable AI (XAI) in the field of education. It was held in conjunction with the Seventeenth International Conference on Educational Data Mining (EDM 2024) in Atlanta, Georgia, USA on July 14th, 2024. The workshop attracted researchers with diverse backgrounds who share the common goal of achieving greater algorithmic explainability and transparency in education research. The format of the workshop was hybrid, with atteendees both in person and online.

2. Overview of the program

The workshop program consisted of a poster session, a keynote presentation, a panel discussion, and three working sessions towards a cohesive vision for XAI in education.

2.1. Poster session

Eight papers were presented at the workshop's poster session: four accepted papers (out of 9 submissions received) and four encore papers. The accepted papers consisted of three research papers and one position paper, all of which can be found within these proceedings. The encore papers were specially invited presentations of work that has been or is being presented elsewhere—dealing with the theme of XAI in education—and which the organizers agreed would contribute to the aims of the workshop. Links to the original encore papers can be found on the workshop website.

2.2. Keynote

Cristina Conati, Professor of Computer Science at the University of British Columbia, delivered a keynote address titled "Personalized XAI". In her presentation, she discussed the importance of explanations in AI-driven systems, noting that while they can be useful, they are not always wanted or effective. She emphasized the need for carefully designed explanations that meet the needs of specific learners. Through

examples from her research, she demonstrated how a system that provides explanations that are personalized to learners' personality traits and cognitive skills can have a positive impact on explanation effectiveness, which can in turn affect learning outcomes and learner perceptions.

2.3. Working sessions

During the workshop's three working sessions, we intended to provoke researchers' thoughts and discussions about XAI in education through guiding questions such as "what kind of experience do you have with XAI", "what barriers exist to successfully using XAI in education", and "what challenges does the XAI in education community need to address". We briefly summarize the outcome here.

Workshop participants agreed that XAI can help improve model performance, address model biases, help students learn better, and support student metacognition. The target audience of explanations was a repeated theme throughout the working sessions, and can consist of developers of the model, users of the system (such as teachers and students), and other stakeholders (such as school administrators, legal teams, and parents).

Participants also brought up the need to understand XAI as part of a larger pipeline rather than as a standalone goal. This suggests that the effective design, use, and explanation of AI models in education needs to involve humans as part of the process. There was also discussion about the possibility of triangulating explanations with multiple sources of knowledge (e.g. check that they are plausible based on the nature of the data and human intuition) to ensure accuracy and intelligibility.

In terms of moving the field forward, the participants agreed that it is necessary for the community to use a common vocabulary of XAI as well as to advance explainability evaluation metrics in their studies—though sound evaluation approaches will depend heavily on context. Participants also discussed the possibility of using simulated students in XAI studies in education. This thread was further explored with a discussion on the need for robust ways to validate simulations and the challenge of designing simulated interventions. Finally, there was some discussion about the potential for using large language models (LLMs) to further the goals of explainability, though there was some apprehension due to the inherent opaqueness of LLMs themselves.

2.4. Panel

The HEXED 2024 workshop included a panel discussion with three researchers: Lea Cohausz (*University of Mannheim*), Jakub Kuzilek (*Humboldt University of Berlin*), and Juan Pinto (*University of Illinois Urbana-Champaign*). This format provided the opportunity to learn more about

the work and views of these specific researchers, with questions from a moderator and the audience. The discussion included topics such as successful uses of XAI in education, open challenges for the field, and existing barriers for broader adoption of XAI.

2.5. Working diagram

With the goal of better understanding the current state of the field and some future directions, participants contributed to a collaborative visual map of the things discussed during the workshop. This working diagram (created using the Miro platform) allowed participants to make connections between concepts, questions, and prior studies. We hope to continue building on this preliminary ontology so that it can serve as a foundation for future work.

3. Program committee

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