Creativity Supporting AI: Empowering the Next Generation of AI Creators

Children's creativity contributes to their learning outcomes and personal growth. Advancements in generative models introduce compelling mediums of creation. In my work, I explore how we can leverage AI to foster creativity in children. I explore ways to empower young creators by understanding how children can partner with AI agents to create art, developing accessible generative modeling tools for k12 students with a strong focus on ethical implications, and scaling these curricula to diverse communities. I contribute to the fields of generative algorithms for collaboration and human-computer interaction for creativity support. The work impacts children's creative development, a skill especially valuable in an AI-driven future. I propose two approaches: (1) *Designing creativity supporting collaborative AI agents,* and (2) *Developing creative AI education curricula and resources that make tools of creation accessible to all children.*

AI supporting human creativity

Children learn creativity through social interactions with others. In my work thus far, I demonstrated how we can use Socially Assistive Robots (SARs) as effective creativity support tools in collaborative tasks. I designed collaborative child-robot interactions where the SAR Jibo was trained on textual and visual generative models to co-create art with children in games that afford verbal and figural creativity. I modeled Jibo's social scaffolding on teachers' scaffolding inputs with students to support constructional creativity and problem solving. The robot's expressed creativity, and social scaffolding behaviors successfully stimulated children's creative expression during the task (Ali, et al. 2021). In future work, I propose developing turn-based creative algorithms, which utilize a human-in-the-loop model to update generations during inference, to support co-creation. I aim to do this in the context of open-ended collaborative verbal and visual storytelling, for which I propose to train child-friendly language models. Through human studies, I propose to study how my interventions in generative algorithms and robot interaction patterns benefit children's creativity.

Creative AI education

While tools of AI creation are compelling ways to create art, these tools remain inaccessible to those with limited computational resources and technical knowhow. This hinders equity in creating generative art and makes children vulnerable to their ethical implications. I developed a low-resource Creative AI curriculum for middle school students focusing on the creation of AI-generated media, and its societal and ethical implications. I deployed the curriculum with over 200 students participating in youth programs for student groups under-represented in STEM (Lee, Ali, et al. 2020). I developed a learning trajectory for teaching socio-technical systems (Ali, et al. 2021). I am currently collaborating with teachers to integrate these resources into middle school curricula. As generative models are a rapidly evolving area of research, I propose to develop an evolving low-resource AI-creation studio where students can train generative algorithms, and use human input to collaboratively create art with AI. I propose developing a framework to adapt emerging algorithms to teachable lessons for students, together with their applications and ethical implications. I aim to study how children partner with AI, what they choose to create, and how effective art is as an entry point to AI education. This research is impactful since it empowers young children to leverage AI algorithms for creative applications, and prepares them to navigate their societal implications.

References

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