AI in Education

Overview

- AI's potential in education
  - AI has the potential to usher in a new age of education and revolutionize the way we learn. By working with AI, humans will be able to more quickly generate ideas to solve problems, brainstorm and create engaging learning experiences, and find exactly what they are looking for on their learning journeys.

- Risks and responsibilities
  - There are risks inherent in working with this rapidly evolving technology. For example, the text generated from LLMs should not be taken at face value, but should rather be independently validated whenever possible. This means that human judgment will remain as important as ever, if not more so!

- Evolving our understanding
  - AI-powered tools are exciting, but they can also be alarming and strange. As we learn more from our community about what they would like to better understand about AI in education, our understanding grows as well allowing use of AI-powered tools with confidence.

- Embracing change
  - New developments are calling into question what a formal education should include. By becoming more fluent in the variety of ways AI can be used ethically and responsibly, we can more confidently embrace the change it represents.

How do students learn?

Students learn more when they:

- are **actively engaged** with the material to be learned

- get **immediate feedback** on their responses to new material being learned

- work on material that is just **at the edge of what they can do** when provided with a little support

- **see value** in what they are learning

- are working on **realistic experiential** problems

- learn **1:1** or in **small cohorts**

The scale problem

While we know how students best learn, the reality of scaling class sizes has **always** been the problem. From classrooms of 20+, lecture halls of 200+, and MOOCs of 20,000+…the individual attention needed to best educate is very difficult to manage despite decades of work and rethinking education toward flipped, project-based efforts in pedagogy (children), andragogy (adults) & heutagogy (self-directed).

Educational technology has tried to fill this gap with personal devices to bring classrooms closer. But these solutions have struggled to really act as tutors, in part because they were not easily able to consume and produce open-ended responses in natural language. Mostly, these were just IT tools with an eye on systems but not improving education.

It's difficult and it has been difficult for educators and computers—to provide consistently rich, personalized, insightful, actionable feedback to student comprehension on a large scale.

That is changing.

A solution ~~on the horizon~~ is here

Learning outcomes are improved through 1) active engagement, 2) immediate feedback, 3) working at a personal/experiential learning edge, and 4) perceived value. Large Language Models (LLMs) can promote learning by:

- Leading students through the steps of the writing process while offering rubric-based feedback on drafts

- Encouraging students to check their understanding of procedural and application-based skills and tasks

- Engaging with individual students on deeper learning questions like why, what if, and how

- Helping students link what they are learning to their goals, their lives, and the things they are interested in

These are things we can ask LLMs to do today.

Concerns

There are many concerns as something so disruptive enters our society.

A top concern with education is equity.

Countries and corporations will attempt to regulate this AI technology and with that comes a monetary cost of using these tools. This cost threatens to further separate those with access to tools and those without.

The gap this may create between those who can afford/access a co-pilot educator tutor and those who cannot may deepen a gap between those with access to education and those who cannot.
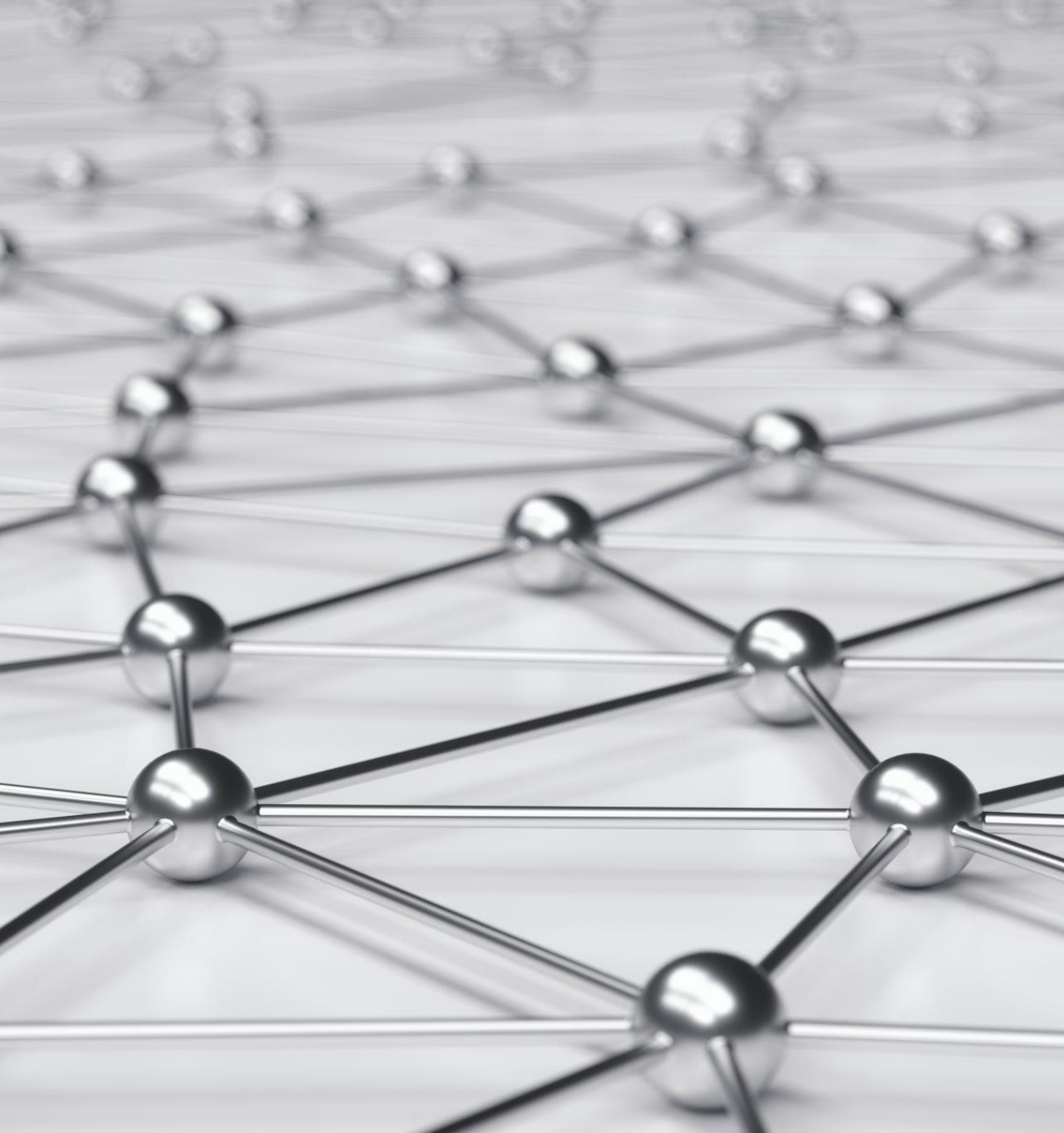
ON THE OTHER HAND

When deployed with the intention to "raise all boats", access the AI education can create an equity of access to excellent education never available before. Most of the world now has devices that can access LLMs, but LLMs have a cost. How do we balance this when cost is always a barrier to so many?

Interesting projects – Education

- [Practical Responses to ChatGPT and Other Generative AI](#) – Montclair State University

- [GPTeam](#) - A completely customizable group of AI agents, with independent personalities, memories, and directives.

- [Mr. Ranedeer](#) - Your personalized AI Tutor!

- "[Duolingo Max](#)" - Shows the Future of AI Education

- [Khanmigo](#) - Khan Academy's AI-powered guide. Tutor for learners. Assistant for teachers.

- [Learn XYZ](#) - Another A.I. Learning Sidekick

- [A Map of Generative AI for Education](#)

- ["Artificial Intelligence and the Future of Teaching and Learning" from the US Dept of Education](#)

- [CU AMC AiEdu Discord Channel](#) for real-time resources, projects, and conversation.

Interesting projects – Medical

- Dr. Gupta – AI Physician Chatbot

- Dr. McGrath – AI Vet Chatbot

- MedPaLM2 - harnesses the power of Google's LLMs, aligned to the medical domain to more accurately and safely answer medical questions. Also - Groundbreaking research in health AI

- Nabla Copilot – Superpowers for clinicians, generates your clinical notes in seconds

- Elicit - Find insights across 200 million research papers

- ScholarAI, Superpower GPT and put scientific knowledge at your fingertips - fast, reliable, peer-reviewed data, "ScholarAI Celebrates 6 Million Requests, and What's Next"

- CU AMC AiEdu Discord Channel for real-time resources, projects, and conversation.

CU info & resources

- [AI/ML and Data Science](#) – AI Group establish by AMC IT

- [The AI Buzz Explained](#) - Usage, Security, and Privacy Concerns with ChatGPT by Office of Research Informatics

- [Psychiatry AI Interest Group](#) – Department hub for AI interests.

- http://bit.ly/ai-ehthics-news

- [AI in Education](#) - Google Group with 700+ members

- [CU AMC AiEdu](#) - A broad community of educators focused on best practices, resources, social connections, and interesting projects in the world AiEdu.