

Mathematics Colloquium

Where Does AI Fit? Cautious Steps from Human Judgment and Algorithms to AI-Assisted Research and Practice

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Abstract

The rapid development of generative AI creates an appealing possibility for researchers: tasks that previously required substantial human effort, or specially designed computational algorithms, can now potentially be performed by general-purpose AI models. But the fact that AI can perform a task does not necessarily mean that it should. In this talk, I will describe a series of cautious steps toward integrating AI into mathematics education research. Drawing on examples from tasks such as assessing students' mathematical work, tagging and coding responses, and classifying data for further analysis, I will consider activities that have traditionally been carried out by human researchers, by purpose-built algorithms, and, more recently, by large language models. Rather than asking how we can use AI for every stage of the research process, I will focus on a different question: **where are the natural fits?** What kinds of tasks benefit from the flexibility and scale offered by AI? When does AI reproduce—or perhaps improve upon—what humans or algorithms already do well? And when does replacing human judgment introduce new problems concerning validity, consistency, transparency, interpretation or even fairness? The examples will be used to suggest a cautious approach to AI integration: not a wholesale replacement of existing research practices, but an iterative process of identifying promising tasks, testing what is gained and lost, and determining how and where human judgment should remain central.)

About the speaker: Shai Olsher is a Senior Lecturer in the Department of Mathematics Education, School of Learning Sciences and Educational Leadership, at the University of Haifa. He also serves as Head of the Center for the Advancement of Teaching and Learning at the University of Haifa and leads the university's pedagogical integration of AI into teaching and assessment. His research brings together mathematics education, digital technologies, and the design and implementation of curriculum resources, with particular interests in digital assessment, learning analytics, mathematical task design, and technologies supporting the learning and teaching of mathematics. He received his Ph.D. from the Weizmann Institute of Science in 2015. His recent work increasingly connects his research and institutional roles, focusing on the thoughtful integration of AI into educational research, teaching, and assessment, and on the pedagogical questions that arise as AI takes on tasks previously performed by educators, researchers, or purpose-built computational tools.