

Mathematics and AI

Yuri Gurevich

Abstract. The deep-learning revolution has brought us Generative AI – most notably, ChatGPT. Programmers embraced Generative AI as a capable assistant, boosting their productivity. But this isn't a simple success story: as institutions need fewer programmers, some lose their jobs.

Could the same happen to mathematicians? I've been using ChatGPT myself. It's no Fields Medalist, but it is a competent research assistant that never sleeps. Will it become so good that institutions need fewer mathematicians? That is the question explored in this talk.

The emergence of Generative AI, particularly systems like ChatGPT, represents a significant milestone in the deep-learning revolution. While programmers have quickly adopted these tools as capable assistants that enhance productivity, this technological advancement presents a complex narrative. The efficiency gains come with consequences, as institutions require fewer programmers, leading to job displacement in the field.

This development raises crucial questions for the mathematics community. Based on personal experience using ChatGPT, while the system cannot be compared to Fields Medalists in terms of mathematical creativity and insight, it functions as a competent research assistant that operates continuously without rest.

The central question this talk addresses is whether artificial intelligence could advance to such a degree that educational and research institutions would require fewer mathematicians. This exploration considers the potential trajectory of AI development in mathematics and its implications for the profession.

Biographical Note

Yuri Gurevich is Professor Emeritus at the University of Michigan. He spent the last 20 years of his career at Microsoft Research as a Principal Researcher. Professor Gurevich is a Fellow of AAIA, AAAS, ACM, EATCS, and the Guggenheim Foundation; a foreign member of Academia Europaea; and holds Doctor Honoris Causa degrees from Belgian and Russian universities.

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