

Leiden Declaration

Mathematicians warn against AI in their profession. 'What is our role anymore?'

AI is starting to get very good at math, but that might not be so good for math. In a statement, a group of mathematicians argues for rules that should prevent human researchers from fading into the background.




Leiden University, cradle of the Leiden Declaration of mathematicians who are concerned about AI in their field. Photo Hollandse Hoogte / Peter Hilz

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3 June 2026, 05:39

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On Tuesday, sixteen mathematicians published the 'Leiden Explanation'. In it, they argue for rules and standards that should ensure that their profession continues to revolve around human researchers: their curiosity, their critical ability and their right to recognition of their work. Until Tuesday morning, 566 colleagues from all over the world expressed their support.

Advertentie



The signatories call on individual colleagues to always be open about the digital tools they use, to check for themselves whether the results are correct, and to refer to previous research on which the AI has built. Mathematicians' associations and institutions that fund such research must promote or even enforce this.

But that's easier said than done, says signatory Tammy Kolda, who worked as a mathematician at the Sandia National Laboratory in the U.S. state of New Mexico. She is now an independent consultant and deputy head of the publications department of the American Association for Applied Mathematics, Siam.

In her first role, she is very much in tune with AI: "I'm currently working with genetic data, which is not my expertise, so I have it translated and computer programs written."

But, she says: "With my Siam hat on, most of what I do has to do with the misuse of AI. Articles with fabricated references to previous research, articles that seem to have been written entirely by AI, even reports from reviewers to whom this applies. We have just published new policies to make it even clearer what we do not tolerate."

Contradictions

The Leiden Declaration stems from an international conference last year in that place on the role of computers in mathematics. Rodrigo Ochigame, lecturer in digital anthropology at Leiden University, was a member of the committee that developed the statement. There were sometimes considerable contradictions, he says, for example between researchers at universities and at companies. "It's very satisfying when you discover that you agree on a lot of things."

Companies that develop AI systems receive special attention in the statement, because they have started to enter the mathematical field with giant steps. Such as OpenAI, whose AI system ChatGPT answered a question asked by the famous mathematician Paul Erdos eighty years ago last month. Such a result may be good advertising for an AI system, but verifying and publishing it should be done in the same way as other mathematical research, according to the authors.

The Leiden Declaration also has a message for the government. This should regulate the AI industry to prevent the technology from being used incorrectly, but it should also ensure that AI is widely

Level playing field

That would ensure a level playing field, says Jeremy Avigad, professor of both mathematics and philosophy at Carnegie Mellon University in Pittsburgh in the US, and also a signatory. "I would hate it if there comes a time when success in math depends on how much money you can spend on math."

But the mathematicians' concerns, he says, go deeper than just equal opportunities or verifying proofs, and generously referring to previous research. "What worries us is that AI is becoming very good at some things that we thought only we could do. So what is our role then?"

Whether mathematics is still a subject with a future is a question that young mathematicians and their mentors are now struggling with, Avgad knows. But no matter how disruptive AI is now, in the long run, mathematics will retain its essence, he thinks, including the role of humans in it. "We are rational beings, we think, we reason. If there is a computer somewhere in the corner that proves all kinds of brilliant theorems, then it doesn't bother me at all, unless I can question it, understand what it does."

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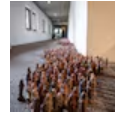
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