

MY PRINCIPLES ON AI IN MATHEMATICS

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I have signed the [Leiden Declaration on Artificial Intelligence and Mathematics](#) and [A Severe Misalignment of AI in Mathematics](#).

Some mathematicians have explicitly stated that they do not use LLMs in their mathematical research; see, for example, [Vladimir Lazić's position](#). Their voices deserve serious attention.

For most researchers, however, the growing role and impact of LLMs in mathematical research can no longer be ignored. I am among them: I use LLMs and find them genuinely valuable. At this stage, I have decided to set out the following personal commitments and reflections.

- 1. I want the main ideas of my papers to originate from my own thinking. For this reason, I will not discuss or develop the main ideas of my papers with commercial LLMs.**

This does not mean that I avoid LLMs. I treat an LLM much as I would a colleague: I may ask it questions and learn from its answers, but I do not share with it the main ideas of my ongoing work. The boundary is not always sharp, since a question can reveal a direction and an answer can shape one. In the end, it rests on my own judgment rather than on a precise rule.

Why draw the line here?

First, when the main ideas or approaches of a mathematical paper are developed through discussions with a commercial LLM, it becomes difficult to distinguish what genuinely originates from the researcher and what comes from the AI. Even if you believe that your questions and insights have played an important role in guiding the model toward a new approach, the resulting ideas may not be entirely your own.

Moreover, I am concerned that the mathematical ideas and approaches developed through such interactions might eventually be used by commercial AI companies to improve their models, regardless of their assurances about data privacy and model training. If this happens, other researchers may soon obtain essentially the same approaches simply by consulting an AI, even when working on different problems for which those ideas happen to be useful.

Second, if the central ideas of a mathematical project are generated by an AI system rather than developed independently by the researcher, there is no reason to assume that other researchers using the same model could not obtain similar ideas. This creates a peculiar situation: researchers may find themselves competing for priority over ideas that they did not truly originate.

In such a situation, researchers may feel compelled to write and publish their results as quickly as possible to establish priority. But I do not believe that rushing to publish is a healthy way to conduct serious mathematical research.

I have recently witnessed too many troubling phenomena in mathematical research: different groups posting essentially the same proof of a conjecture within just a few days of one another, or researchers rushing to make partial progress public, only to publish several closely related papers in rapid succession. I believe that the growing use of AI has contributed to these phenomena. Instead of carefully developing their ideas and pursuing a problem in depth, researchers may feel increasingly compelled to publish whatever progress they have made before someone else does.

If the main ideas do not genuinely originate from the researchers themselves, such competition for priority can easily degenerate into something resembling dogs fighting over a bone. Moreover, excessive reliance on AI to generate mathematical ideas may gradually lead to a homogenization of mathematical thinking, as researchers increasingly obtain similar approaches and insights from the same models.

2. **My main purpose in writing mathematical papers is to develop and share my own ideas and thoughts.** This requires time for reflection, accumulation, and maturation.

I believe that developing one's own ideas, however modest they may be, carries a profound personal significance. This may be increasingly difficult in the age of AI, but discovering even something small through my own thinking matters more to me than obtaining a much more impressive result whose essential ideas come from an AI system.

For me, the value of doing mathematics lies not only in the results one obtains, but also in the process of developing one's own understanding and ideas. I do not want to lose that experience, nor do I want to confuse AI-generated ideas with ideas that I have genuinely developed myself.

3. **I do not oppose the use of AI.** There is no doubt that AI will make enormous contributions to the development of mathematics. Recent AI-generated preprints have even claimed solutions to major long-standing conjectures, including the log abundance conjecture, Campana's abelianity conjecture for special compact Kähler manifolds, and Kobayashi's canonical-amenability conjecture for compact hyperbolic Kähler manifolds. Whether these claimed proofs ultimately withstand mathematical scrutiny remains to be seen, but such developments already demonstrate the extraordinary potential of AI in mathematical research.

What I wish to express here is simply my personal attitude toward the mathematical work I produce and the way I choose to pursue mathematics. I do not expect other mathematicians to make the same choices.

4. **There are already more than enough people racing to use AI to produce mathematical papers and claim proofs of major conjectures. I choose not to join that race.** This is a personal choice. For me, even a small but distinctive remark of my own, offered after reading the proofs of these conjectures, carries a deeper meaning.