The Erdős Proof and AI Capabilities

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An internal model at OpenAI has autonomously disproved a central conjecture in discrete geometry,[1] a mathematical field with applications in cryptography, wireless device communication, and medical imaging. The proof relates to a famous question posed by Paul Erdős in 1946.[2] It has been verified by prominent mathematicians in a companion paper.[3]

The verifying mathematicians consider this to be a genuinely novel breakthrough on one of the most discussed problems in this area of mathematics. One called it “arguably the best known problem in Discrete Geometry.” Another observed, “If a human had written the paper and submitted it to the Annals of Mathematics and I had been asked for a quick opinion, I would have recommended acceptance without any hesitation. No previous AI-generated proof has come close to that.”

The proof illustrates a general trend towards autonomous, agentic problem-solving in AI systems. OpenAI describes the system that produced the proof as a general-purpose model not specialized in mathematics. AIs can now perform long, novel chains of reasoning on difficult problems and are beginning to outstrip our ability to measure their progress.[4]

AI agents still perform best in domains with easily verifiable outputs, such as mathematics and cybersecurity. For example, Anthropic's Claude Mythos found thousands of vulnerabilities across every major operating system and web browser, and was deemed too dangerous for public release.[5] Such capabilities are why the government is now more interested in evaluating frontier AI models.[6]

AI research is also a field with many easily verifiable outputs. Researchers at OpenAI and Anthropic take advantage of this fact to accelerate their work; senior researchers now claim they make only high-level decisions and let AI handle most of the coding.[7] Experimenting with the coding capabilities of a publicly available model, like Claude Code, immediately demonstrates how far AI has come in the last year.

OpenAI and Anthropic intend to use AI to enhance future models with minimal human oversight. To justify the urgency, these companies cite the importance of beating rival U.S. or Chinese labs.[8] Many of the field’s foremost experts warn that this race ends with human extinction.[9]

Policymakers and researchers, including the founders of the AI revolution, are calling for international restrictions on the technology.[10] A growing bipartisan and international consensus of political leaders agree.[11]

Endnotes

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6. Jacob Wendler, Dana Nickel, Dasha Burns, and John Hewitt Jones, “Trump Moves to Police Frontier AI Models,” *Politico*, May 20, 2026, politico.com.
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