

# Nineteen researchers say AI is not sentient—not yet

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There is a joke about the daughter who asks her dad why he speaks so quietly around the house. "Because there is artificial intelligence everywhere that is listening to what we say," the dad replies. The

daughter laughs, the father laughs. And Alexa laughs.

Artificial intelligence does seem to be injecting itself into more and more aspects of our lives. And as AI brains earn the equivalent of a million doctoral degrees while absorbing trillions of bits of data and in turn generate responses with an engaging tone and demeanor that sound as simple and humanlike as your favorite old college professor, some feel compelled to ask: Are computers becoming sentient?

A cynic would respond, "Of course not. Computers may solve problems in seconds that would take humankind generations to solve, but they can't feel love and pain, can't see and appreciate the moon and the stars, can't smell the coffee we spill on the keyboard."

But others suggest we need to more clearly define what we have come to understand as sentient. Could there be differing degrees of consciousness as we understand it? Are there components of subjective experience overlapping among humans, animals and intelligent machines?

Nineteen neuroscientists from the United States, England, Israel, Canada, France and Australia have explored the issue in a report published in the [preprint](#) server *arXiv* Aug. 22.

A lead scientist at OpenAI, which developed ChatGPT, speculated last year that advanced AI networks may be "slightly conscious." A year earlier, a Google scientist was fired after declaring LaMDA, a precursor to the chatbot Bard, was sentient.

But after extensive analysis of numerous theories of consciousness, the authors of the report, "Consciousness in Artificial Intelligence: Insights from the Science of Consciousness," concluded that AI systems are not conscious; at least not yet.

However, they mapped out approaches that future investigators would do well to consider.

"Our analysis suggests that no current AI systems are conscious," said Patrick Butlin, a leading author of the report, "but also suggests that there are no obvious technical barriers to building AI systems which satisfy these indicators."

They narrowed down theories of consciousness to six they say are compelling indicators of conscious entities.

One example is the Recurrent Processing Theory, which states the brain processes information through feedback loops. Through such loops, the brain can adapt to changing circumstances, make adjustments to perceptions and make more informed decisions. Such iterative behavior is key to memory formation and acquisition of new knowledge.

Another key concept is Higher Order Theory, summarized by some as "awareness of being aware."

"Higher-order theories are distinguished from others by the emphasis that they place on the idea that for a [mental state](#) to be conscious, the subject must be aware of being in that mental state, and the way in which they propose to account for this awareness," said Butlin.

A third factor is the Global Workspace Theory. This posits that awareness is achieved when information becomes globally accessible in the brain. Information is not limited to individual sensory inputs, but is contained in a global hub available for varied internal cognitive processes.

The proposed tools for deterring sentience "offer us the best method currently available for assessing whether AI systems are likely to be

conscious," Butlin said.

"We are publishing this report in part because we take seriously the possibility that conscious AI systems could be built in the relatively near term—within the next few decades," Butlin said. "These prospects raise profound moral and social questions."

**More information:** Patrick Butlin et al, Consciousness in Artificial Intelligence: Insights from the Science of Consciousness, *arXiv* (2023). DOI: [10.48550/arxiv.2308.08708](https://doi.org/10.48550/arxiv.2308.08708)

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