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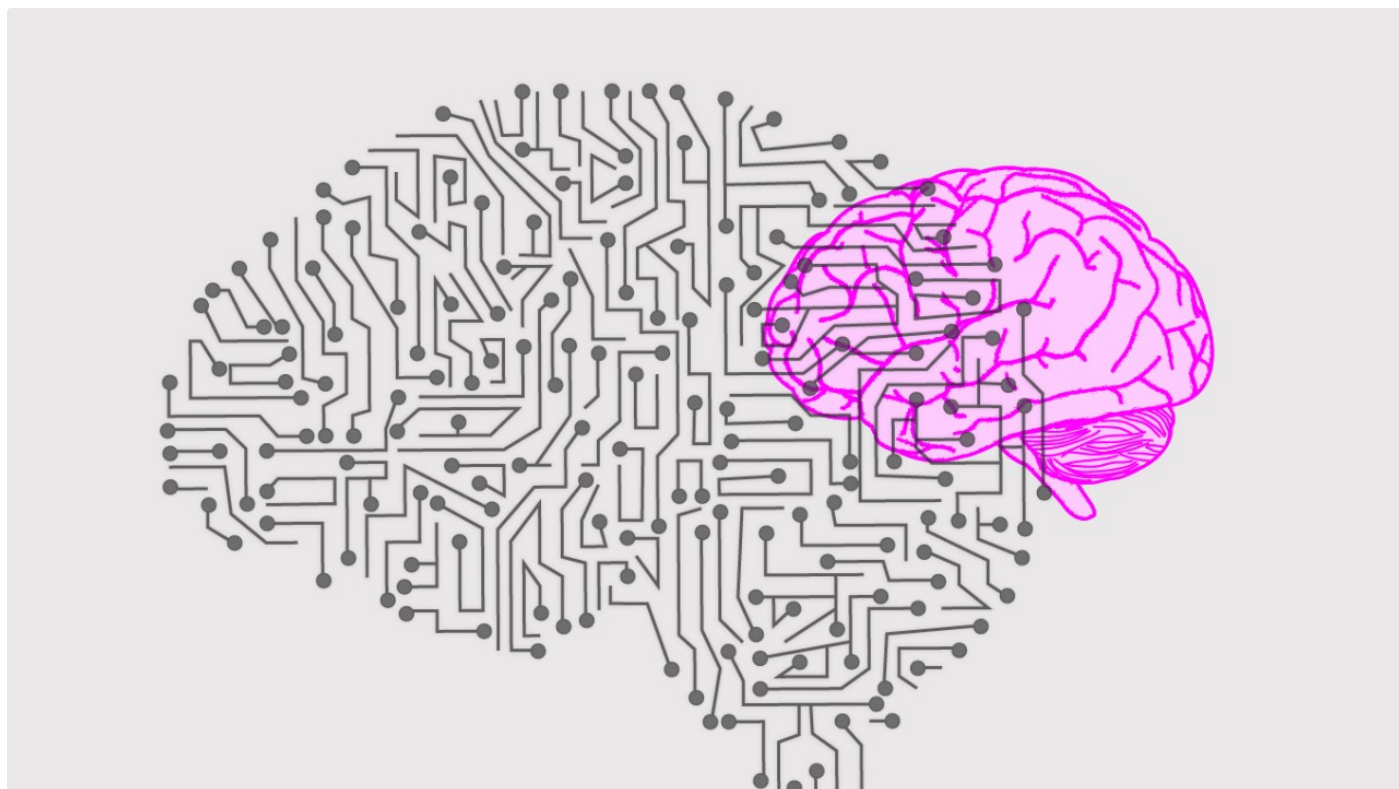


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VIEW

From AI to AGI in 2025: What does today's AI actually lack to become AGI, human-like intelligence?

Artificial Intelligence March 26 at 5:30 AM



Associate Professor, Aarhus Business Academy

There is no consensus on what Artificial General Intelligence exactly is. Human-like intelligence could be a proposal.

But humans are not equally intelligent in all areas. Some people are very musical, some are good at logical thinking, others have great self-awareness, etc. AI has long surpassed human intelligence in specific areas, such as playing chess, being able to quickly translate between languages, predicting 3D structures in proteins, etc.

The article continues after the ad

But of course, it is quite another to have machines with general intelligence that can perform a wide range of tasks at the same level as a human.

And this is where AI language models become interesting, as they can apparently now talk about anything.

ChatGPT's creators, OpenAI, don't tell us exactly what they're working on to introduce more human-like reasoning into the models (in the so-called reasoning models), but it seems plausible that it could involve breaking down the creation of answers to difficult problems into smaller steps ('chains of thoughts'), trying different reasoning 'paths' and making different kinds of validations along the way. If a user, i.e. millions of users, is satisfied with a line of reasoning, the system can take note of it, just as the system can also take note of users who are dissatisfied. And in that way it gets better.

It was with some excitement that many of us sat ready to test the ChatGPT o1 model in the fall. Many had the idea that if you were to find things that the models were less good at, you should come up with a problem that had never

been seen before, and perhaps create questions where the solution is based less on words and language, and more on, for example, imagination.

So in a popular problem, ChatGPT o1 is asked to " imagine a box with 4 holes into which you can stick your hand. Inside the box, there is a switch at each hole, which can be *off* or *on* . You decide for yourself which holes you want to stick your hands into. In each round, you can put these switches as you like, then the box is rotated around by a super intelligent robot and lands in a new way, where you don't know what you have touched before. How many rounds does it take to be sure that all switches are either *off* or *on* ?" .

With a piece of paper and a little time, many people come up with a strategy for what they would do to solve the problem.

But. The shudder. Would ChatGPT figure it out? Were we facing Artificial General Intelligence, human-like intelligence?

When I tried, I got a long explanation from ChatGPT o1, filled with many intermediate calculations and finally a very precise answer, to which the model had added QED, Quod Erat Demonstrandum, after which one could then set about investigating whether everything was really in its most beautiful order.



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The answer was wrong.

Which wouldn't have surprised AI researcher Subbarao Kambhampati of Arizona State University, who, with a background in automated planning, has been a constant voice in recent years reminding everyone that critical thinking

is as important now as ever: Language models can't [verify their own answers](#) . If you break a difficult problem down into smaller parts, every link in the chain of reasoning must be correct before you can be sure that the final answer is correct. And there are no external universal mechanisms that you can just [call along the way to decide whether a statement is true or false](#) .

Bigger is not better

Kambhampati also does not believe that the solution is simply to make the language models even bigger, trained on even larger amounts of data, in the hope that the models will then develop '[emergent behaviours](#)', [in the form of human-like reasoning abilities](#) . According to Kambhampati, far too many have been far too uncritical when reporting on so-called 'emergent behaviours'. We must remember that the internet is huge, and many times we probably just get back things that are already out there in one form or another, and therefore are not original thinking. Overall, Kambhampati is not a big fan of 'emergent behaviours'. When you build an IT system, you want to know exactly what you have built.

It is not in itself commendable if your IT system exhibits behavior that you cannot explain. An AI system that is supposed to be responsible for train operations must not hallucinate on the job, and people would certainly become uneasy if physical robots around them suddenly started doing completely unexpected things.

Towards AI systems with their own models of the world

And Kambhampati is not the only one who is somewhat reserved about how far large language models can actually go. According to AI researcher and Chief AI Scientist at Meta, Yann LeCun, we are still a long way from [AI systems that can reason and plan at a human-like level](#) . According to LeCun, language models predict and understand the world (i.e. texts) in one dimension, while AI models that work with images and video understand the world in two dimensions.



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But to truly understand the world, and to be able to think, one must be able to do simulations in three dimensions. One must have a world model - a 'world model' - in which one can test and simulate actions in the world before actually doing anything. With such simulations one can explain why one did a certain action, and one can be surprised when one sees something that contradicts one's model of the world.

There are, of course, many problems that need to be solved before we get to the point where we live in a world with robots that walk around with their own world models. LeCun points out, for example, the problem of dividing an overall plan into small sub-plans. Sure, if you're going from the US to France, you'll have to fly, but you'll also have to have a plan to get to the airport, and before that you'll have to get out of bed in your home in the US. Even with all of Facebook's resources at your disposal, it's not that easy to write a program that can solve these kinds of problems, in general.

General intelligence is not easy. It is not just about having several 'narrow intelligences', but also about integrating these together into a whole. Human brains are not only equipped with language understanding and language generation in the Wernicke and Broca areas of the brain, but have connections crisscrossing to other areas, such as the prefrontal cortex, which can contribute to planning and decision-making.

Perhaps Artificial General Intelligence is not just around the corner. And many statements from marketing departments around the world will probably eventually be seen in the same light as we now see the somewhat optimistic announcements made by AI researchers Simon, Shaw and Newell in 1957, when they introduced the world to GPS (General Problem Solver), a computer

when they introduced the world to GPS (General Problem Solver), a computer program that back then in 1957 promised to be a universal problem solver.



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That said, it is worth mentioning that although Kambhampati is skeptical of many statements about large language models, he never fails to praise all the things the models are good at, such as idea generation and much more. LeCun is of course fully aware that there is still a long way to go before we have AI systems that can make simulations in their world models, and thereby understand the world in a human-like way. But according to LeCun, there are still ways open to a future world where all humans have a larger staff (AI agents equipped with AGI) employed to help them.

According to LeCun, there is no reason to worry about where such a story will end. Intelligent agents will not appear overnight. We must view the problems in relation to how far we have actually come. We need to have some faith in progress. And there is time to work for the good version of the future. In addition, we humans would like to understand what intelligence is - both that of machines and our own. Work needs to be done for the cause, but according to LeCun, the way forward is good enough.

And when he means it, surely the rest of us can mean it too?

The above post is part 2 of Simon Laubs, associate professor at the Business Academy Aarhus, series on AI to AGI. You can read or reread the first one [here](#).

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