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Can robots truly be creative and use their imagination?

Two scientists and two artists give the answers you might not expect

Rachel David

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DAVID COPE

Composer, author and professor emeritus of music at the University of California, Santa Cruz

I define creativity as the association between two ideas that one would not ordinarily consider a reasonable one to make but that works. I think that this is a rather simple thing to do for computers.

I've been working on writing novels computationally for well over 10 years now and I'm still trying it, although I believe that within the next two to three years I will have broken its back and will produce 100,000-word novels in half an hour or so, novels that I think most people would consider to be creative. I can do uncreative short stories at this point, ones where the associations are routine and expected; they have occurred in many thousands of previous books. But I believe that in the near future my programs will be able to do creative ones.

MARIA TERESA LLANO RODRIGUEZ

Research associate, computational creativity group, Goldsmiths University

We are used to machines being used as tools that do not have a high level of cognitive ability, so it's difficult for people to think of them as being able to exhibit truly creative behaviour. A problem with earlier approaches was their dependence on hand-coded tasks and knowledge, which restricts the reasoning capabilities a machine can carry out. People are creative because they understand the properties of objects in the world, and based on that knowledge they breach convention in non-trivial ways that make sense. In the same way computer systems require the ability of acquiring knowledge in order to enable creativity. Artificial intelligence research is aiming to overcome the challenge of hand-coded features through more flexible approaches in which software systems can constantly learn new representations of data, modify themselves according to it and exhibit creative behaviour.

MICHAEL OSBORNE

Associate professor in machine learning, University of Oxford

Creativity is arguably the most difficult human faculty to automate: robots are unlikely to be fully creative any time soon. Automation usually requires exactly the kind of explicit instruction as to how to achieve a goal that creativity obviates. It is certainly possible to design an algorithm that can churn out an endless sequence of paintings, but it is difficult to teach such an algorithm the difference between the emotionally powerful and the dreck. Another problem is that it is difficult to automate the combination of ideas from many different sources that forms the source of much of human creativity: you might find inspiration from an interview with a neuroscientist in designing a new office layout. Putting some evidence to our thesis, we found, for both the UK or the US, that almost 90% of creative jobs are at low or no risk of automation.

ERICA WAGNER

Author and literary critic

My instinctive thought is no. I've heard people talk about the way you can get computers to do tasks like play chess, which are very sophisticated, but very bounded tasks. But then I took a quiz and did pretty badly: they had little examples of poetry, some of which were written by computers, I guessed one right, I didn't guess the other one. I think that our human brains are much more subtle and extraordinary and strange than machines could ever be. I would say that, wouldn't I? I don't want to be put out of a job. Most people thought that no one would ever fly in a machine, so we have to be pretty careful about saying what we think machines are capable of. So I don't know is the honest answer.

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