

Q&A with an AI veteran scientist

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World-renown cognitive scientist prescribes an approach for advancing AI and explores the potential for creative partnerships between AI and humans.

Since [Margaret Boden's](#) first scientific publication on artificial intelligence in 1970, she has led the most significant breakthroughs and periods of struggle in the field. Founder of the first research program in cognitive science, Margaret continues to study AI and the complexity of the human mind. Research professor at the University of Sussex in the UK. In 2016, Margaret was named alongside Stephen Hawking as an advisor to the [Leverhulme Centre for the Future of Intelligence](#), a community of technology and policy researchers exploring AI.

As you reflect on your long career in AI, what have been the real breakthroughs?

AI has given us a much greater understanding of the richness and subtlety of the just as AI research was taking off, Pat Winston, a talented young developer and Artificial Intelligence Lab, was told to take the summer and create a vision system developing. In retrospect, the idea that one could program a system as intricate vision over a summer is a ludicrous proposition, but the point was that at the time and others had little understanding of just how much was involved. AI has played a framework to gain that understanding. Our minds are virtual machines, and AI about how our brains process information in rigorous and systematic terms. The breakthroughs have occurred, in my opinion.

For the young Margaret Bodens starting out today, what are the essential questions in AI discovery?

Machines are very much better at understanding than they were before. They're pick up nuances in word usage, and so forth. But none of that is grounded in true need to understand what the brain is doing and how it's doing it. [Deep learning](#) to generate useful applications, but considerable work remains at the analytical human cognition works in supporting problem-solving and critical thinking and c

“Our minds are virtual machines, and AI has given us about how our brains process information in rigorous terms.”

You don't subscribe to the idea of the “singularity” then, the idea that computers will reach the level of human intelligence?

The human mind is the most advanced system we have, and language in particular computing have progressed tremendously, but the capabilities remain quite limited. We will ever fully replicate the potential of the human mind, certainly not within the

Creativity has been a major interest of yours. Do you see AI as a means of our way of enabling us to understand human creativity?

I'm interested in how computational technology can [help us understand human creativity](#) involve learning and exploring in a hierarchical style. Neural and multil help us construct different frameworks to better understand those hierarchies, to learn and discover. If you have a computer that comes up with random combina

of that stuff will be utterly uninteresting rubbish, but some of it will not be. A hurried insight and time could well pick up an idea or two. A gifted artist, on the other hand, could take a random compilation and come away with a completely novel idea, one that sparks a new composition. That's a very different type of creativity. About 95% of what professors do is either exploratory or combinational, and the other 5% is transformational. Professors don't really have a good understanding of these processes. That's where AI has a powerful role.

What's needed to enable future discoveries in AI?

Right now, many of us come at AI from within our own silos and that's holding us back. [AI in a multidisciplinary way](#) because the brain itself is a bundle of interdependent thinking and behavior that's describable on many different levels. To accelerate cognition, neuroscientists, linguists, psychologists, philosophers, anthropologists and others need to come together. All these questions about creativity and aesthetic thinking and behaving, they all in the end boil down to questions about information. Why are they all so closely linked.

In some ways, we need to get back to our roots. When AI was just getting going, there were provocative conferences where people from all different areas would come and we began to specialize over time and interdisciplinarity decreased. To catalyze change, we need to embrace that eclecticism and variety and collaborate more closely.

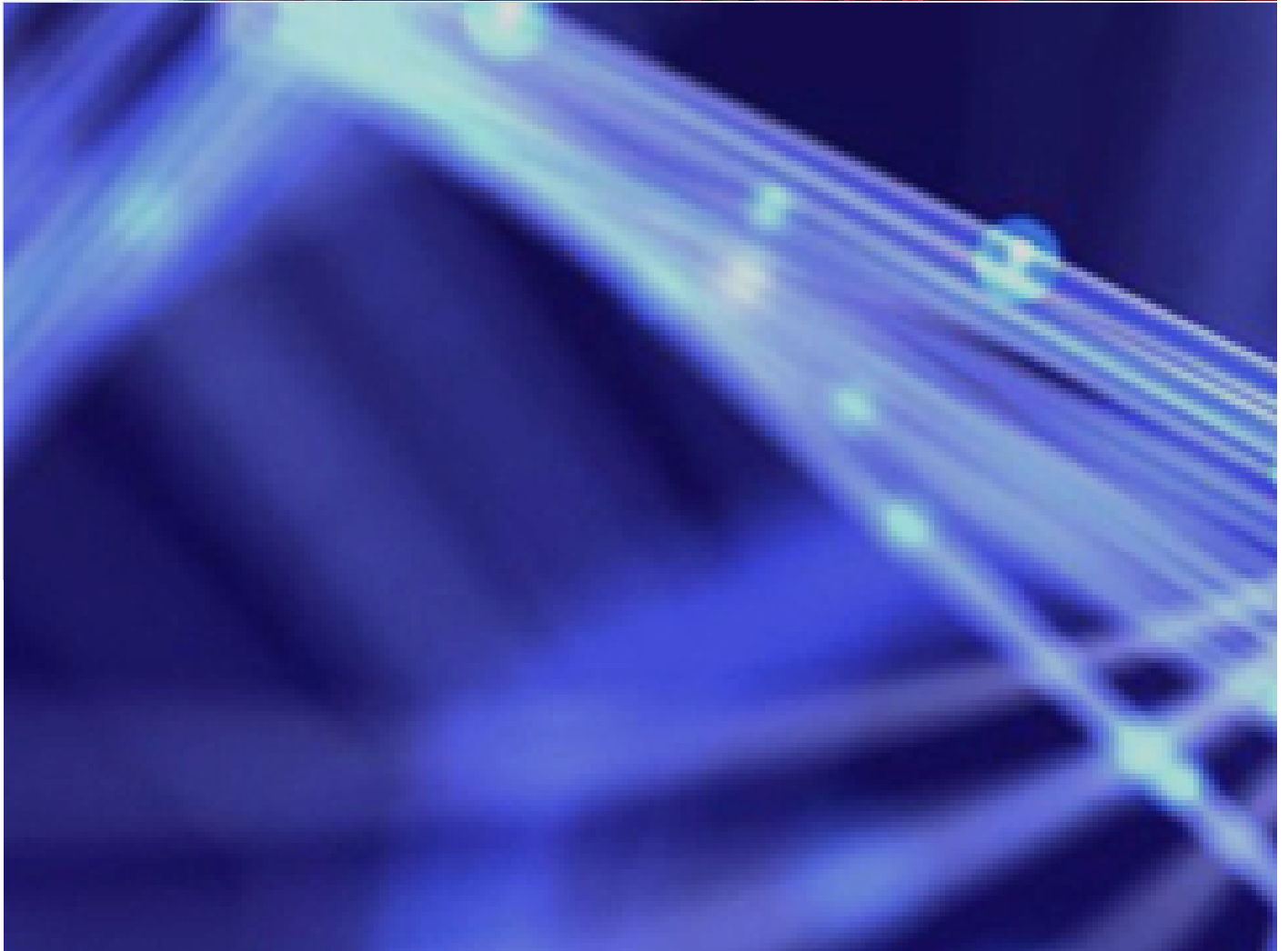
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