Workplace diversity will soon include artificial intelligence

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Dr Micheal Harre is thinking through how the AI future will work. Credit: University of Sydney

A tsunami of change is already arriving. Artificial intelligence is now capable of doing desk jobs that were previously safe from automation. The social and economic effects remain to be seen, but is AI what we think it is?

Workplaces that include artificial intelligence (AI) will soon be reality, say researchers who believe the rise of AI in all areas of life is not only inevitable, it's set to reshape the way we think about consciousness and human identity.

From Metropolis to 2001: A Space Odyssey and The Terminator, robots and super-intelligent AIs in film have seduced and terrified our collective consciousness, having an impact on how we view artificial intelligence. But will they really crush the puny humans and take over the world?

The truth is both less dramatic and more exciting.

Michael Harré (PhD '09), AI enthusiast and lecturer in Complex Systems at the University of Sydney, believes living and working with AI will force us to reassess basic assumptions about our sense of self.

"What will it be like to regularly confront an AI, or a robot with an AI in it, that behaves like a human?" Harré asks. "The fact that we will be interacting with the appearance of consciousness in things that are clearly not biological will be enough for us to at least unconsciously revise what we think consciousness is."

AI development has a long way to go before then. AI and humans have very different decision-making processes. Humans rely strongly on intuition, while AI crunches all possible options and calculates the most

likely answer. All this data-crunching comes at a cost: the vast computational power that's needed limits the number of tasks AI can do. It tends to be a one-trick pony. This means we won't be relegated to the evolutionary scrapheap just yet.

Though movies often feature robots with sophisticated AI minds, that combination is still a distant possibility.

So what is AI? A very different discipline from robotics, artificial intelligence is a field of computer science that mimics the natural learning process of the human brain by creating what are called artificial neural networks. For example, an AI is given a picture of a wolf and told to trawl through millions of animal photos and find other pictures of wolves. Each correct answer reinforces the AI's neural pathways, so it actually learns from experience. The software isn't specifically coded – rather the program evolves its own algorithms and uses feedback to refine the results.

These types of AIs are very good at dealing with massive amounts of data, making them invaluable for services such as fraud detection and security surveillance. Working with these huge inputs of information makes AI a power-hungry beast that devours huge computational resources.

While a robot mastermind might not occupy the next cubicle in the short term, AI has been moving into various industries since the 1990s – from finance to communications, heavy industry and even toys – constantly evolving and becoming more sophisticated.

In the last two years there has been landmark evolution of artificial intelligence. Energy-efficient computers and microchips based on the neural structure of the brain are driving the surge in AI advancement. Virtual personal assistants such as Apple's Siri and Amazon's Alexa,

movie recommendation services and online customer support are all examples of artificial intelligence in services that we increasingly take for granted.

As useful as neural networks like these might be for interpreting data and identifying patterns, they lack long-term memory and struggle to perform basic computational tasks.

Harré is part of a new wave of researchers exploring the relationship between human thinking, artificial intelligence and economics. He believes that understanding human cognition will drive AI advancement – and vice versa. "The stronger the connection we can draw between economics, psychology and neuroscience – three very different fields studying humans at very different scales – the better our understanding will be in all three areas."

To that end, Harré and his colleagues received a grant from the Australian Research Council (ARC) in 2016 to develop simple AIs called agent-based models that simulate the Australian housing market and identify if it is at risk of collapse. Millions of households are modelled by these AIs, which interact with each other to buy and sell houses. The project will allow them to look at different suburbs, cities and regions across Australia to identify the factors that might lead to a system-wide collapse.

"We want to know what drives bubbles, whether those drivers are in the current Australian market, and how we deflate the problem of a potential crash by helping inform policy," Harré says.

For Harré, it's not just the computational power of AI that is useful, it's the potential of a future in which we will work with and interact daily with AI personalities – and he is excited about the diversity of viewpoints this implies. AI, by its nature, will have opinions.

We talk about diversity in the workforce. In the future that will include AIs.

There is no doubt automation will change the workforce; and not just for repetitive tasks. AIs are already being used in law and medicine, not only to read and assess documents but to make recommendations, while advances in robotics are allowing doctors to perform surgeries remotely. Soon simple surgeries may even be performed by AI. Despite the pervasive fear that technology will innovate whole careers out of existence, Harré believes that people who are flexible and open to learning will continue to be in demand.

"I think we're going to end up with a very dynamic workforce," he says. "The key thing for the future is going to be people who are more willing to be agile within the jobs they take."

With huge companies such as Google, Facebook and Microsoft investing heavily in AI systems, the future is looking a lot closer. One advantage of working with AIs? They won't be lining up to use the coffee machine any time soon.

Provided by University of Sydney