

ROBOTICS AND AI: REPLICATING THE HUMAN

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Robots are set to invade workplaces, shops, homes, schools and hospitals. Whereas traditional industrial robots are large, unthinking, complex to programme and too dangerous to operate alongside people, the emerging generation can perceive and learn, be taught tasks on the fly and move among us to greet customers, help out in the lab or office, care for the elderly, teach children and save lives.

Artificial intelligence, whether on board a robot or racing across the web, is predicted to take jobs from drivers, soldiers, teachers, journalists, doctors and even lawyers. What does this mean for business, the economy and our lives?

According to visionaries including Stephen Hawking, Bill Gates and Elon Musk, the thinking machine may become a threat to our very existence. Does a robot vacuum cleaner in our home augur the "singularity" - when artificial intelligence exceeds our comprehension and control?

In this podcast [Andrew Maggs](#), a Principal Associate in the [Tech team](#), talks to guest panellist Rich Walker, Managing Director, Shadow Robot Company, whose robot hand mimics human dexterity, sensitivity and size and is used for NASA's "Robonaut", hazardous environments, assistance for the elderly with Mild Cognitive Impairment and a robot Stephen Fry.



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Transcript

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Andrew Maggs: Hello everyone, my name's Andrew Maggs. I'm a principal associate in Wragge Lawrence Graham & Co's tech team. I'm here today with Rich Walker, managing director of Shadow Robot Company to discuss robotics and artificial intelligence. Rich, robots incorporating Shadow Robot's Dexterous Hand have been in the press quite a lot recently, not least NASA's Robonaut which works with humans on the International Space Station and Moley's robo-chef designed in conjunction with Masterchef winner Tim Anderson to cook perfect meals, but what are the big issues facing robots as they become more and more integrated into our world?

Rich Walker: Well Andrew I think the old joke in robot circles was that the biggest problem in robotics was batteries and our stock answer to how we were going to solve that was to wait for mobile phone and laptop manufacturers to achieve some breakthroughs in that area, and over the last decade they really have picked up the pace. New fuel cell technologies, new rechargeable batteries really are starting to make robots have three or even four hours of operating life for a humanoid that you could almost get to do something in the office, but then the bigger challenge is how do you get the robot to actually perform a practical task. For example if I reach out for this glass over here, I can do it with my hand freely and easily and very conveniently pick it up and put it to my

mouth. I don't have to think about that whole process. I have an understanding of what I need to do to grab and to hold an object, to interact with it, to make it useful and giving robots that capability is what at Shadow we've been doing for nearly two decades now.

Trying to replicate the human right hand to put that on a machine other people have worked on vision, have worked on bipedalism, have worked on locomotion, navigation understanding comprehension we thought the really hardest thing is getting a robot to be able to pick something up reliably and well and keep hold of it reliably and well and then put it down in the right place at the right time and that's turned out to be a fascinating challenge for us.

When we developed the Moley robot kitchen the reason that Michael Oleynik the inventor came to Shadow came to London from his global entrepreneurial background was precisely that we were developing robot hands and no one else was and he saw that he needed something that could have that flexibility that could interact with any object in the kitchen, any object in the house. It was no good building a machine that could cook if a chef could say but it cannot do my flambé because it cannot swirl the bottle of Cointreau in the correct way. The robot had to be able to capture the same fluidity, the same dexterity, the same elegance that a human chef brings to cooking and for that we had to give it hands like a human hand. Most of the time it's true, all the robot does is pick something up that you can pick up but the flexibility is there, the sensitivity is there and so we have a robot that is without limits in terms of what it can do.

Andrew: Thank you Rich for talking to us today and thank you very much for listening to our podcast. We hope you found it interesting and useful, if you have any further questions please get in contact with anyone in our Tech team.

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