

Rise of the Robo Tsar

When Rod Brooks headed to the US after graduating from Flinders in 1977, there were just three mobile robots in existence.

Now, the iRobot company he founded has on its own produced more than 14 million – ranging from household robot vacuums to military robots tooled to detect and disarm roadside bombs. When Japan's Fukushima nuclear plant failed catastrophically after the tsunami of 2011, it was Dr Brooks' cyber progeny that were sent into the plant on mission after mission, equipped with Geiger counters to search for areas of danger – doing work too dangerous for people.

The quiet boy from Glenelg who was fascinated with electronics and harboured an abiding love for maths has become one of the world's leading roboticists – but is quick to point out that he was set on his career path by Dr Jerry Kautsky in 1973 during his Bachelor of Science degree at Flinders.

"Flinders had a mainframe computer with 16 kilobytes of memory and during the week there were four full time operators taking jobs on punchcards," Dr Brooks said.

"During the weekend Dr Kautsky let me and another student have that computer to ourselves for 12 hours every Sunday. From 9am 'til 9pm every Sunday we were in with that computer, running it ourselves and learning all sorts of stuff."

The hands-on experience with the Flinders computer gave the talented coder an opportunity to build computer functions way ahead of his time – kick starting his technological career. The young Rodney Brooks built a virtual memory system and an operating system, re-inventing functionality that he had read about in magazines.

"I realised that I wanted to make computer science my career. I got into graduate programs at Carnegie Mellon and Stanford and so I went to the library at Flinders and got an atlas. Stanford was closer so that was the one I chose."

Dr Brooks embodies the American fairy tale, but as he tells his story, it is easier to hear the wondering boy from Glenelg than the international technologist who has redefined the human relationship with robots.

In summarising his career to date, he points out he has established five companies, of which "only two have been successful and only one has made any money yet."

"I was very fortunate to get to Silicon Valley before anyone knew about Silicon Valley. After graduating from Flinders, Dr Brooks completed his PhD at Stanford, had his first child, founded his first Silicon Valley software company, held tenure-track faculty positions at both Stanford and M.I.T. and wrote two books – all before the age of 30.

Fascinated by the potential of robotic devices, he developed new companies aiming to create intelligent devices of the future – all the while refining his understanding of relationships between humans and robots.

At M.I.T., he became director of the University's largest laboratory, the Computer Science and Artificial Intelligence Laboratory and earned an international reputation as a leader in robotics – only stepping down from his tenured role in 2010 after 26 years of service.

During his M.I.T. years, Dr Brooks earned widespread attention for his 2002 book *Flesh and Machines: How Robots will change us*, which postulated that the gap between humans and robots was narrowing as humans wore and used more technology and robots were developed with capabilities to be more sensitive to human needs.

iRobot, established in 1990, took off in 2002 with the release of the Roomba, a robotic vacuum cleaner that could clean rooms without requiring any human control. More than two million Roombas are now produced annually and a quick glance at the viral success of online videos such as 'Cats on a Roomba' provide indelible proof that the technologists' devices are helping to make robots an accepted part of global culture.

In 2008, armed with more ideas and a desire to create rather than sit back and let the profits of manufacture roll in, Dr Brooks stood down as Chief Technical Officer of iRobot and established his latest start up – Rethink Robotics.

The company has produced the world's first collaborative robot for industrial settings; a robot that is safe to work with shoulder to shoulder, and one that ordinary factory workers, can quickly learn how to train, so that it can do new tasks without having an engineering team reprogram it. Baxter, the company's first model, and Sawyer, a model to be released in September of 2015, have been deliberately styled with human characteristics and an unmistakable edge of warmth. From the company's trademark red components to the screen positioned in the place of the robot's head, adorned with a stick figure's face, Rethink is developing robots that workers can feel comfortable around on the factory floor.

The robots are equipped with sensors that prevent them from bumping into and injuring people around them; the eyes on Baxter and Sawyers' faces glance in the direction that they are about to reach, just as a human's eyes would and yet they are capable of doing repetitive, precise tasks almost endlessly.

Baxter has been sold to hundreds of research laboratories around the world – including Flinders – and is also being widely used in factories, but Dr Brooks expects thousands of the new generation Sawyer robot will be installed in factories and businesses around the world within two years.

Slightly further down the track, Dr Brooks expects Sawyer's successors to provide additional labour in key areas of workforce need, such as aged care.

"I'm worried that we're not going to have enough robots in the world," Dr Brooks said.

"Societies in the western world are aging rapidly and the younger guys don't always want to be looking after older people, so we are going to have to have robots to help us maintain our independence and live our daily lives."

In a neat full-circle, the Baxter robot is now being installed on the production line of renowned South Australian chocolatier Haigh's, just down the road from where the boy from Glenelg grew up.

But with more robots to develop and the global roll out of Sawyer around the corner, there's no sign that Dr Brooks will be sitting back to enjoy the chocolates any time soon.

