

Roadmap for robot helpers

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The humble robot cleaning your floor heralds a wave of robot helpers, from miners to surgeons, that could be joining us in the coming decades. How should the industry prepare for these new markets?

Since the 1980s industrial robots have become commonplace and in recent years cleaning robots have started tidying up in our homes. In 2007 there were an estimated 6.5 million robots around the world and that figure is projected to rise to 18 million by 2011. Europe has a quarter of the world market for [industrial robots](#) but how can it ensure that it maintains its position in the future?

The EU-funded CARE project (Coordination Action for Robotics in Europe), coordinated by Rainer Bischoff and Tim Guhl of KUKA Roboter in Augsburg, Germany, was set up in 2006 to create a Strategic Research Agenda (SRA) to guide the development of robotics. “We

wanted to make sure that a lot of different stakeholders were involved,” said Guhl. “And we wanted to have an industrially driven agenda - that was very important.”

The project was run in association with EUROP, the European Robotics [Technology Platform](#), set up to enable European robotics companies to build and maintain world leading positions in all robotics markets to the benefit of European society. More than 130 organisations helped to develop the agenda over a period of three years.

Product visions

CARE assembled teams of experts in each sector of robotics - industrial, professional service, domestic service, security and space - to think about the kinds of ‘product visions’ that might one day lead to marketable products. A total of 39 were identified, ranging from mining robots to surgical robots and [robot](#) teachers.

But when the experts looked closely at the product visions they discovered an alternative way to classify robots, by six cross-sector ‘application scenarios’. These are robotic workers, robotic co-workers, logistics robots, robots for surveillance and intervention, robots for exploration and inspection and ‘edutainment’ robots.

“If you look at each of the application scenarios, their product visions have similar requirements,” says Guhl. “But as the product visions come from various sectors it follows that cross-fertilisation may be greatly beneficial. The SRA highlights where there are similarities and where the sectors can support each other, where technology developed within space robotics, for example, might become useful for domestic service robotics or the other way round.”

Eighteen technologies

One thing that sets robotics apart from other industries is that there is no one technology called ‘robotics’. In fact, 18 different groups of technologies are identified in the report and many of the product visions make use of all of them. That can make it difficult to know where to focus development efforts. The basic question to ask, says Guhl, is whether a technology is driven by robotics or not.

“Batteries, for example, are very important for mobile robotics,” he says. “But a lot of money is already going into developing batteries for the automotive industry and for mobile devices. On the other hand, you have technologies like autonomous navigation. This technology is mostly driven by roboticists, but is also integrated in automobiles which you would normally not classify as robots. So some technologies need to be driven by robotics and some don’t.”

The agenda lists eight conclusions, or ‘commandments’, that the robotics community needs to adopt if it is to make the most of the available opportunities.

A major challenge in robotics is the integration of the many different technologies into coherent systems, which has implications in many areas such as education. The SRA advises that a European supply chain is needed to reduce dependence on overseas suppliers. Research should concentrate on the key, robotics-driven technologies. Also, it will require more effective working between academia and industry and greater cooperation between the traditional sectors to create new markets.

Multitalented specialists

The multiplicity of technologies also leads to unusual education and

training needs. “You don’t need specialists in one or two areas to sit around a table and come up with a good product,” says Guhl, “You need a number of different specialists, sometimes having knowledge of a numerous disciplines - such as mechatronics engineers - speaking the same language.” Social, legal and ethical issues also need to be anticipated if robots are to play a greater part in our lives and carry out some of the functions normally done by human beings.

The Strategic Research Agenda was published in July 2009 and the CARE project finished last October. A successor project, euRobotics, is set to make the agenda “come alive”, as Guhl puts it, and “get the whole community working together more closely”.

Whatever happens, he expects to see many more robots appearing in our day-to-day lives over the next decade or so. “They can help us with caring for people, with making our public spaces safer, with being productive enough to keep manufacturing in Europe, and so on. There is close to no area where robotics can't help in one way or another.”

More information: CARE project - www.robotics-platform.eu/SRA

Provided by ICT Results

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