

Dolls, pets, drones: six ways that robots will change the way we live

Robotics has long been touted as the solution to humanity's woes, only for reality to fall short of the hype. But today's inventions really are changing lives for the better. **Nicola Davis** visits the Future of Robotics forum to pick six of the best

No time for a dog, but missing a pet? Want to retrofit your house without turning it into a building site? Wondering how you could fix your roof without a ladder? Robots could be the answer. Digital animals, construction drones and furniture that is smart in all senses of the word are among the innovations that could soon be heading into, under and above our homes, roboticists revealed last week.

Speaking at Re.Work's the Future of Robotics forum in London, experts from academia, industry and the startup scene came together to unveil the latest innovations from their labs, share their experiences and discuss the challenges of turning prototypes into viable products. "Robotics investment is really on the increase at the moment," said Nikita Johnson, founder of Re.Work.

But while robotics groups across the UK are bristling with good ideas, she believes we are lagging behind when it comes to commercialisation. "Where we need to catch up on is really making sure that that [work from universities] gets to market and thinking about how we can try and integrate that into industry so that it does have an impact and it's not just left in the lab."

Among those aiming to bridge this gap is Sebastian Conran, designer in residence at the University of Sheffield. Working with researchers including Professor Tony Prescott, director of the Sheffield Centre for Robotics, Conran has been involved in pioneering solutions for the household, from robotic companions to "smart" furniture that can assist elderly or ill people. "Robotics is the new rock'n'roll," he says. "It's about finding compelling uses for it."

CIVILIAN DRONES

While drones might evoke images of huge military unmanned aerial vehicles, researchers point out that they can also provide solutions to numerous civilian conundrums, from fixing a roof to taking the perfect selfie or even monitoring pollution levels. Currently on display at the Science Museum, London, is a 3D-printing drone created by Dr Mirko Kovac from Imperial College London that can extrude a foam material while on the wing.

His biological model for the device was swiftlets, birds that knock up a nest using their saliva. Kovac believes such drones could be useful in repairing inaccessible, damaged regions of the home or other structures. But he is confident there is more to learn from the natural world, including ways of increasing observation time for sensing drones without the need for greater energy.

ROBO-PETS

Move over Tamgotchi, a new digital pet is about to roll into town. This cutesy robot, set to be launched nationwide next spring, boasts the ability to respond to voices, recognise objects and even take itself to a charging station when zonked. Under development by a team that encompasses EagleMoss publications, Conran and robotics experts including Prescott and Dr Ben Mitchinson from the University of Sheffield, the bot – it is claimed – mimics a real animal.

"The control systems inside the robot are modelled on what we think mammalian brains are doing," says Prescott. The aim is that you'll be able to train your new companion. "It will be learning according to the same principles – stimulus response learning, or reinforcement learning



Clockwise from above: Kaspar the doll; robotic ball Moti for children with autism; q-bot for use in construction work; Miro, a robo-pet that mimics real animals; and a 3D-printing drone.

– that animals can do," he adds. Your robo-pet will be fitted with cameras and microphones; you can keep tabs on what it can see and hear via an app on your tablet or smartphone. But rather than arriving as a readymade bundle of robotic joy, it will be available as a magazine-based build-it-yourself kit.

Q-BOT

Seeking to take the grunt work out of the construction industry, q-bot is a new company on the block, deploying compact, sturdy robots to apply underfloor insulation, removing the need to pull up floorboards and install cut-to-fit panels.

"A quarter of the UK's properties are more than 100 years old and the vast majority, 7 million of them, have got suspended timber floors which just allow cold air to come up," says Mathew Holloway, managing director of the company, which is now offering the service commercially. When introduced into the bowels of a building, the robot maps and surveys the area, providing insights into what lies beneath, before using the data to systematically spray insulating material to the underside of flooring.

It can then record the depth of the insulation applied. The benefits? Toasty toes, fewer draughts and lower bills – without the need for a huge upheaval.

MOTI

Recently crowned grand winner of the inaugural Robot Launch startup competition, Moti is a robotic ball designed and created by fledgling company Leka, and is aimed at the healthcare sector. With robotics groups worldwide exploring the potential of robot-assisted therapy for children with autism – including Kaspar, a lifelike doll created at the University of Hertfordshire to help children with autism to understand emotions and facial expressions – the Leka team have developed a programmable plastic sphere that can change colours, move and respond to users.

They believe their interactive tool will be able to help autistic children to communicate and socialise. Prototypes are expected to boast more sensors, collect data and play music; the team are hoping to make Moti commercially available by 2016.

MECHA MONSTERS

Robot wars could be coming to a living room near you, thanks to Reach Robotics' gaming robots: Mecha monsters. Controlled by an app on a tablet or smartphone, users can "fight" their robots with pre-programmed moves and use developer software to

create new actions. "In the industry at the moment, the products you get are either very simple products that kids are bored with – and adults are bored with – in a week's time or really complex products that once you have programmed it's something you can't really do much more with," says Silas Adekunle, founder of the startup company. "We want to create something that allows you to have fun and also has an opportunity to educate."

Due to be launched for pre-order on crowdfunding site Indigogo next month, the first Mecha monsters are expected to ship in time for Christmas next year.

SMART FURNITURE

Another innovation from the fruitful collaboration that includes Prescott and Conran is smart furniture that appears to blend in rather than stand out. Currently under development is a smartphone-controlled cantilevered table that can navigate around the home or hospital to transport items, as well as adjust its height and tilt. With a tablet or iPad hooked up, users can talk to friends, family and healthcare providers face to face, as well as make use of voice and gesture control.

But Conran believes its uses could be manifold: "With a bit of modification, so people don't pinch your champagne, you could see it in room service," he says.

