Invisible computing comes to Asia tech expo

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People stand amongst robots in the "Influencia: Living Life with Sentient Machines" exhibition at the SIGGRAPH Asia 2011 Exhibition in Hong Kong on December 13, 2011. The robots in the "Influencia" exhibition sense and respond to the presence of people within the area.

A robotic cook, a colouring book that comes to virtual life and movies that read your mind are some of the innovations on show at a cutting-edge computer technology exhibition in Hong Kong this week.

The first Asian edition of the SIGGRAPH expo of computer graphics,

interactive technology and digital media brings together developers, distributors and resellers from around the world.

But while most of the conference is about business, some of the most interesting -- and just plain bizarre -- gadgets are not for sale.

The "emerging technologies" hall is where the real boffins from universities and research laboratories strut their stuff with prototypes fresh off the drawing board, in the name of science rather than profit.

Mark Billinghurst, director of the Human Interface Technology Laboratory at the University of Canterbury in New Zealand, said the research was breaking down the physical and mental barriers between humans and computers.

"What the emerging technologies show is how the technology can be used in different playful and artistic ways," he told AFP as the three-day expo in Hong Kong's convention centre opened Tuesday.

"We're entering an era now of, I guess you would call it invisible computing, where I can interact with the real world like I normally would and the computer monitors what I'm doing and reacts automatically.

"No longer do we have this separation between the user and the computer like we had 20 or 30 years ago."

His colleagues' contribution to the exhibition includes a system that instantly turns pages from a child's colouring book into three-dimensional computer animation.

"That's really fun for children because they can easily colour and then they can see their colouring image come to life," Billinghurst said.

The robot car of the "Cooky" exhibition is seen at the SIGGRAPH Asia 2011 Exhibition in Hong Kong on December 13, 2011. "Cooky" is designed to help the user cook various customized recipes.

Similar "augmented reality" technology is already common in everyday life, from Nintendo's Wii game console to fighter pilots' heads-up displays.

Unlike virtual reality, which aims to replace the real world with a digital one, augmented reality seeks to enhance reality by seamlessly mixing it with computer-generated information and technology.

One of the simplest new prototypes on display at SIGGRAPH is a vibrating phone that allows users to tickle each other through the touch screen.

"That's really fun because normally when you play with your friends at a remote distance you can't touch them or feel them, but with this you can have that physical contact," Billinghurst said.

Another highlight is a thought-controlled movie programme that can respond to brain impulses. Depending on the electrical currents on the scalp, it can show more or less violence, for example.

"The movie adapts to your behaviour and shows you more of that content, so that's one way you can have a movie that responds to you," Billinghurst said.

Other innovations include polychrome paper that changes colour in response to the warmth of touch, a dress that turns transparent when the wearer's heartbeat increases, and three-dimensional, interactive wall-art.

"This is the type of thing that you might see in a 'Terminator' movie," said Billinghurst, referring to a "telepresence" robot that sends tactile feedback about its surroundings via a vibrating belt worn around the controller's waist.

Its developers at Toyohashi University of Technology in Japan have given it the not-so-catchy name of NAVIgoid: Robot Navigation with Haptic Vision.

Co-developer Dzmitry Tsetserukou -- a towering, bespectacled man from Belarus -- wobbles backwards and forwards as he manoeuvres the robot with his body.

Wraparound dark glasses allow him to see images transmitted from the robot's "eyes", while the belt delivers sensory information about obstacles.

"Our body is the joystick and gives us feedback. It's very intuitive," he said.

The NAVIgoid is not the only device using a "human joystick" at the exhibition. Another is the Joyman, developed by French-based research centres to enhance navigation in virtual worlds by making it a full-body experience.

Other robots include Cooky, developed by Japan's Keio University and the University of Tokyo, which can cook dinner while the user takes a shower or watches TV -- although they still have to chop the ingredients.

"This is just a simple robot so we still need to prepare the ingredients, but in the future everything will be done by a robot," said researcher Daisuke Sakamoto, who specialises in the interplay between humans and robots.

"Human-robot interaction technology is currently very poor. Our robot is showing that the concept behind this kind of interface is very important," he said.