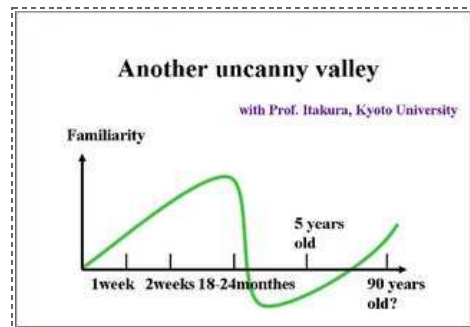


Monday, March 26, 2007

## Another uncanny valley



A couple of weeks ago, I attended the [2007 Human-Robot Interaction](#) conference in Washington DC. Apart from the [deeply expressive RoCo](#) and the [adorable dancing Keepon](#), one of the most exciting moments came when Japanese roboticist [Hiroshi Ishiguro](#) - creator of the unbelievably realistic robotic clone [Geminoid HI-1](#) -

suggested very young children under the age of five may not be able to perceive the difference between a humanoid robot and a real human.

Ishiguro showed us a [video of the robot clone he created of his 10-year-old daughter](#), called [Repliee-R1](#), which is designed to look human but doesn't quite pull it off and which most people find pretty creepy or "uncanny".

The so-called [Uncanny Valley](#) describes this feeling. It is thought to arise because we have a highly evolved awareness of what is human and what is not. But Ishiguro suggests that very young children do not find robots as creepy because they are too young to have formed a firm idea of what a human face and human movement should look like.

To illustrate his point, he brought out a slide showing what he calls the "Age-related Uncanny Valley" (picture above) - a graph that he says shows the age at which children start to find a humanoid robots creepy-looking.

"One-year-old babies were attracted to the child android [Repliee-R1] and were unperturbed by even jerky, robotic movements," he writes in a January issue of [the International Journal of Robotics Research](#). "However, children between three and five years old were afraid of the android and refused to face it."

Ishiguro adds: "If the baby's mental model for recognizing other people is not well developed, the baby accepts the android as a human."

But some roboticists, including Yale University's [Brian Scassellati](#), think Ishiguro has yet to prove this claim. "Children's vision is developing, it's very blurry so young kids don't see as well as they do when they are two and half or three," Scassellati told me. "So they may just not be able to see the difference." Even if children are happy to look at an "uncanny" robot, this doesn't mean they believe it is a human being, he adds.

Another way to test people's perception of robots was demonstrated at the conference by Christoph Bartneck of the Eindhoven University of Technology in the Netherlands. Mimicking a scene from the movie "2001 - A Space Odyssey", in which an astronaut switches off the murderous HAL9000 computer, he set up an experiment in which participants must [switch-off](#) an [iCat robot](#), made by Philips. When the robot was pre-programmed to be agreeable and helpful, people were more reluctant to switch it off, he found.

What I find most interesting is his software, which makes the robot beg not to be switched off as someone starts to do it. Listen to [one volunteer switching off iCat](#). "The stronger their belief that it is alive, the more reluctant they will be to do it," Bartneck told me.

Making robots more communicative is yet another problem for roboticists. To address this, [James Young](#) and colleagues at the University of Calgary in Canada programmed a tablet PC to communicate via Bluetooth with a [Roomba vacuum cleaning robot](#). While the Roomba is happily sucking up dust, the computer [superimposes a smiling cartoon face with its tongue out](#) onto the robot on a computer screen. But, when it gets stuck against an obstacle object, the cartoon instead shows sweat shooting from the Roomba's face.

The idea is that cartoon images are expressive and yet simple to implement. They are also language-agnostic. "Cartoon artists have been solving this problem for years," Young says.

*Celeste Biever, technology correspondent.*

Labels: [interaction](#), [robots](#), [video](#)

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