

Researchers try to make robots approachable, not creepy

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A University of Calgary researcher is studying cartoons, looking for ways to help people accept robots into their lives.

James Young, a PhD student, is working with robotic vacuum cleaners called Roombas, analyzing how giving them cartoon-like expressions changes people's reactions to the machines.

"If you look at a comic book or a cartoon, with very few lines they can show motion, they can show anger, they can show basically almost as much as what a human can show," says Young, who presented some initial research at the second Human-Robot Interaction Conference in Washington last spring.

Young uses a hand-held computer to track a Roomba's movements in a University of Calgary lab and display an cartoonish image of the vacuum cleaner. When the Roomba gets stuck, beads of sweat pop along its brow in the image, and its eyes screw tightly up as it tries to push its way out.

While the Roomba's "emotions" appear only on a computer right now, Young says eventually such robots could have LCD screens or a series of lights that would be used to create a cartoonish expression.

Young and other robotics researchers weren't surprised by a recent study by Georgia Tech's College of Computing that found some people become deeply attached to their Roombas, naming them and even treating them like members of the family. More than two million of the gadgets have been sold since they were introduced in 2002, he says.

"We can take advantage of this anthropomorphic nature of the relationship that kind of builds between a person and their vacuum cleaner," says Young. "Which is kind of bizarre, but it's there and that's kind of where we're coming from with this research."

Some studies suggest people are initially wary of interacting with robots.

"The fact that they're physical and moving around in your space with you adds a level of danger above and beyond what we generally feel with the old-fashioned computers," said Young.

Robotic vacuums are just the start in a growing number of "helper robots" that could eventually be part of everyday life.

Julie Carpenter, who is studying human attachment to robots as part of her educational psychology PhD at the University of Washington, says the field is changing "at an unprecedented pace."

"There are already humanoid robots working as receptionists, wait staff, medical help (in-home and institutional), elder care and space exploration," she said in an e-mail interview.

To fit into society, robots need to pick up on the language, body positions and tones that make up so much of communication between humans. A start is to make them resemble humans on some level, "having a face and eyes, social behaviours and communication," says Carpenter.

But although robots need to have some characteristics that help people identify with them, it doesn't take much to cross the line between cute and creepy.

"When you're building a robot to look like a human, or whatever, the more complicated you make it, and the more lifelike you make it — up to about 90 per cent similar to what people are like — people tend to accept it more and more," says James Smith, a researcher who has studied robotics at the University of Alberta and McGill.

"But once you get up to that 90 per cent, the similarity to people is so great that people's natural tendency of looking for difference kicks in and it becomes unacceptable."

Smith, who is currently doing postdoctoral research in robotics at a university in Jena, Germany, says a robot that was too close for comfort nearly caused the shutdown of an international robotics conference in Beijing last year.

A company that makes lifelike mannequins able to move about had brought along some examples that imitated people to a T, including wrinkles and moles. One of the scientists with the company had even made a doppelganger of himself.

"I couldn't tell the difference between the two. They looked exactly the same," said Smith. "It was really, really eerie."

It was more than eerie for a politician who found out that one of the robots was modelled on him.

"They came within five minutes of shutting down the entire conference because it was considered an insult to be imitating someone in power too much," Smith said. "For the rest of the conference, they sort of hid the robot behind some curtains and nobody ever saw it again."

Young hopes his cartoon caricatures can help robots appeal to humans without spooking us out.

"With cartoon artwork, we can increase the complexity of the robot or make it communicate using language that we understand without making it similar to humans," he says. "I mean, we don't get queasy when one of our favourite cartoon characters get crushed or stretched across the screen — it's just funny."

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