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Humanizing Robots

EXPERT VIEWS

BY KEVIN ASHTON

RFID is enabling robots to sense, identify and communicate with other robots and people.

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Sep 17, 2012 Robots generally get a bad rap in the movies. They go wrong and turn sinister. They act as double agents who take the side of the alien.

They travel back in time and hunt you down. Hollywood's plots contain a seed of truth. In real life, we have no idea how to get along with the robots that work in our distribution centers and manufacturing plants, or vacuum in our living rooms. Today's rules of engagement are simple: Stay out of each other's way.

But as they become more sophisticated, robots are starting to help people, rather than harm or replace them. A nice example of this is Boston Dynamics' BigDog, a robot designed to serve as a packhorse that moves alongside soldiers in the field, carrying their equipment. It has four legs that look like a horse's and bend like a spider's, giving it the balance and agility to climb snowy hills or run in sand.

Still, human-robot interaction research is in its early stages. Robots can't sense the presence of a human, identify a human or have a dialog with a human. RFID is being proposed as a solution to all these problems.

Researchers at MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) envision a world in which robots in factories come out of their safety cages and do grunt work right next to human workers. "If the robot can provide tools and materials so the person doesn't have to walk over to pick up parts... you can significantly reduce the idle time of the person," says Assistant Professor Julie Shah, who leads the lab's Interactive Robotics Group. "Providing robotic assistants to do the non-value-added work can actually increase the productivity of the overall factory." Because so many workers already wear RFID tags, Shah says, this is the obvious way for robots to identify individuals.

At the University of Calgary's Interactions Lab, researchers are developing a way for robots to communicate with people and other robots via RFID tags encoded with messages. "Humans and robots asynchronously exchange information by placing physical tokens—each representing a simple message—in meaningful physical locations of their shared environment," the researchers say.

EL-E (pronounced "Ellie"), a robot developed at Georgia Institute of Technology's Healthcare Robotics Lab, is designed to act as an assistant for physically impaired people. It uses RFID wristbands so the robot can identify people, and RFID tags on medicine bottles so it can identify medication. EL-E can then give people their medicine. According to the researchers, in all of 30 trials, "EL-E correctly verified the tag ID before manipulation, using its finger-mounted antennas." It completed its assignment of handing over the medication 90 percent of the time, and knew it had made a mistake when it failed, the researchers say.

As robotic technology advances and becomes more widespread, it looks like another important application for RFID is emerging: making sure humans and robots get along.

Kevin Ashton was cofounder and executive director of the Auto-ID Center.