

'Robot Olympics' shows off machines' growing abilities

BY PAUL ANDREWS
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Robots have feelings, too. More, at least, than your average blind date.

At the American Association for Artificial Intelligence's 12th annual national conference at the Washington State Convention and Trade Center this week, a Carnegie Mellon robot identified a wadded piece of paper, asked a bystander to pick it up, thanked the person and then said, "Can I go home now?"

It was all in a day's work at the "Robot Olympics," the artificial-intelligence world's premier sporting event.

More than a dozen robots from Stanford, the University of Chicago, Georgia Institute of Technology, Colorado School of Mines, Lockheed, SRI and elsewhere are competing this week in two divisions — office delivery and office cleanup. The winners get bragging rights, awards, research money and, most of all, respect from their fellow humans.

Robotics is only one aspect of artificial intelligence on parade at the conference, which continues through Thursday. Also featured:

- Machine translation, the growing effort to automatically translate straightforward text into foreign languages.
- Computer-aided processes for scanning containers and goods passing through Customs.
- "Intelligent agents" that mine the Internet for requested information on any topic.

Dueling robots are the highlight, though. Yesterday, Chip, the University of Chicago star, picked up an empty soda can with his robotic arm and gripper and announced, "I have found some trash."

Chip didn't really know what to do with the trash, and he decided to take an extended break after the culminating act of his "shift." But he was the only robot capable of actually gathering refuse — a coup for the U of C gang.

Four years in the making and costing \$30,000 in parts alone, Chip was built to prove robots can be like people. Chip has two cameras for eyes, sonar sensors to avoid obstacles and three wheels for getting around.

Robots are widely used in industry today, but most are single-task assembly-line units on electronic or metal rails controlled by wire or radio. Boring, say the folks here.

"People want robots like C3PO," said Mark Fasciano,

a U of C graduate student. "They want something like a butler that can do the work of people."

The sexy robotics work is being done on autonomous (self-steered), mobile robots such as Chip. All have names. Most talk using the same synthesizer technology and, therefore, sound alike. One hums as it goes about its tasks. One year's competition featured a robot that gave a Tarzan yodel whenever it achieved a goal.

In addition to the human-sized version, toylike self-propelled robots made from Lego blocks and assorted moving parts are squaring off daily. Teams of three or four people build the robots from a \$650 kit containing thousands of small plastic parts, laser sensors, a model airplane controller and a battery-powered motor.

Then they race across a big table, motor around a barrier, turn onto a ramp and stop at a laser-beam-equipped tower. The ones that make it, that is.

Robot scientists see both a blessing and curse in the "Star Wars" films' glamorization of their craft. C3PO and R2D2 got people fascinated with robots but raised expectations to an unrealistic level.

"Technology is advancing, but it's slow and painstaking," Fasciano said.

"Half of the problem with robotics is overcoming what people think they (robots) should be able to do."

The notion of robots with human characteristics — called androids — has been popular since the 1950s. Comics, science fiction and cinema have played off the concept so often that robots' defenders think any advance in their work is viewed as anticlimactic.

In 1967, a leading mechanical engineer in London, Meredith Woolridge Thring, boldly predicted that "within 10 years we could have a robot that will completely eliminate all routine operations around the house and remove the drudgery from human life."

Ten years later, Quasar Industries in Rutherford, N.J., announced a 5-foot-2, 180-pound "domestic android" selling for less than \$4,000 and capable of everything from baby-sitting to speaking any language.

By 1984, Roger Smith, the controversial chairman of General Motors, was extolling a future of seeing, thinking robots capable of building automobiles without human help. It would happen within 10 years, he said.

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Robots

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The same overreaching expectations have plagued artificial intelligence, a field postulating that computers can be programmed to think like people.

AI got its 15 minutes of fame a decade ago, when potential applications for everything from washing machines to software were hailed. AI scientists were glad to see the hype fade but think progress isn't given due recognition.

"Artificial intelligence is here, it's available," said Chahira Hopper, a shirttail relative of one of computing's hallowed names, the late Rear Adm. Grace Hopper. "But it's not being used to the extent it could be."

Chahira Hopper, representing the Wright Lab in Dayton, Ohio, said hospitals, airports, schools, prisons

and businesses could make better use of robots for custodial and security purposes.

"You could have them in schools to monitor hallways," she said. "They could be in zoos to watch after animals. People forget that robots can work 48, 64 hours at a time with no need for rest or nourishment. They can work under conditions humans would find intolerable. And they're comparatively inexpensive."

What's 10 years down the road from 1994? In robots as in humans, hope springs eternal.

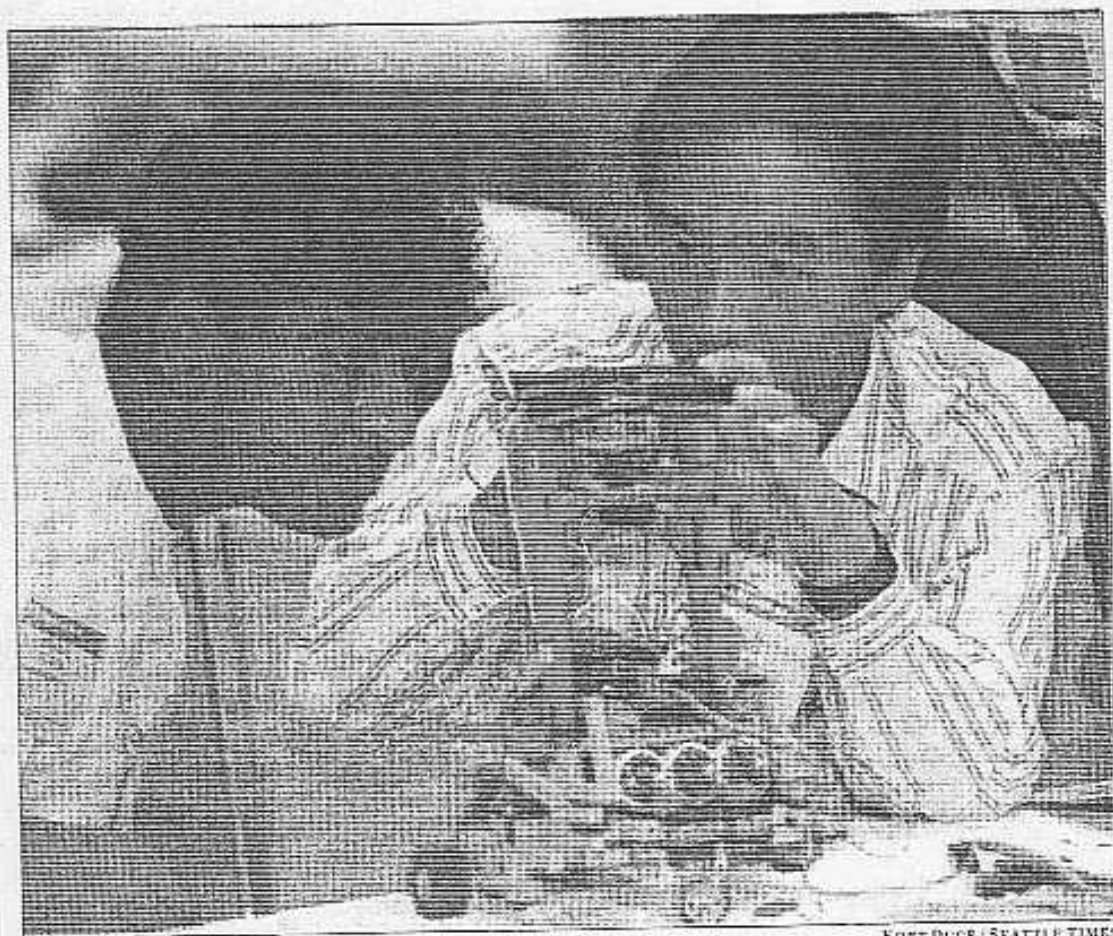
Today the talk is of "shrink-wrapped robots that you buy off the shelf," said Sara Hedberg, a conference publicist. "And it will cost less than a Macintosh."

She said she plans to get one. "I could use some help around the house."

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They're not C3PO, but they're getting there



KURT DUCE / SEATTLE TIMES

Feng Zhao, right, assistant professor of computer science at Ohio State University, and Prabal Dutta, an electrical engineering student, construct their Lego robot before sending it racing around a track.