

# CONNECTION

## SCIENCE

# Baby steps

Robots are a long way from dancing, but U-M professor is taking them closer

BY AMANDA HAMON  
News Staff Reporter

**R**obots in Hollywood movies may walk, talk and even dance, but a University of Michigan professor says real-life robots are a far leap away from that fiction.

In fact, bipedal robots can't even run smoothly – that is, not yet.

Jessy Grizzle, a professor of electrical engineering and computer science, is working to change that. He has been involved in cutting-edge robotics projects since 1998 and is working on a project he hopes will be an invaluable contribution to the robotics industry – and to education in general.

The robot, which Grizzle said is as of yet unnamed, is being put together in collaboration with robotics teams from U-M and Carnegie Mellon University.

"The idea is to make it energy efficient, and to study the dynamics of running," Grizzle said. "It's going to be very exciting to see what happens."

If all goes as planned, the robot will be the first bipedal machine to have spring-infused joints and to exhibit feedback control, which means the robot will recover its motion if it's shoved off course.

In effect, the robot will be moving more like a human than any other previous human-like robot, such as the Japanese-built Asimo or the French-sponsored RABBIT – with which Grizzle also worked.

The U-M-CMU robot is being funded by a \$450,000 National Science Foundation grant. Once the robot is completed and tested, Grizzle said it will reside in Michigan to be used as a teaching aid.

"It will be used to bring in junior high





Jessy Grizzle, a University of Michigan professor in the Electrical Engineering and Computer Science Department, sits with the leg "bone" from a bipedal robot he is working on. Grizzle formerly worked on a French bipedal robot capable of running and walking backward.

ROBERT CHASE, THE ANN ARBOR NEWS

## Jessy Grizzle

**Age:** 50.

**Residence:** Ann Arbor.

### Academics and related work:

■ Received a doctorate from the University of Texas at Austin in 1983.

■ Came to the University of Michigan from the University of Illinois in 1987 as a professor of electrical engineering and computer science.

■ Works for Ford Motor Co. as a faculty adviser focusing on vehicle emission systems.

■ Involved in developing Ford's power management system for a passenger hybrid-electric vehicle.

### Robotics work:

■ Began working on the French

robot RABBIT – the first robot exhibiting feedback control – in 1998; the robot took its first steps in 2003.

■ Began working on University of Michigan-Carnegie Mellon University robot in 2004; it will be ready for assembly in the fall and is the first bipedal robot to have spring-infused joints.

■ Contributions to the projects include writing algorithms for the robots' walking and running and working to make the robots as energy-efficient as possible.

■ Advancements made through Grizzle's work could lead to new technology for prosthetic limbs, physical rehabilitation and robotic rescue teams.

math," Grizzle said. "That was really NSF's purpose for it."

Started in 2004 and still in its infancy, the project still has a long way to go, Grizzle said.

"The challenge for me is writing the algorithms that allow the robot to move smoothly and to run," said Grizzle, who says his function in such projects is to understand and manipulate the fundamental sciences behind the robots.

The robot is now fully prototyped and the teams will begin assembling it in the fall, Grizzle said. The robot will stand 5 feet, 9 inches and weigh 150 pounds when it's completed.

It could be ready to walk – and run – as early as Christmas.

And although its size and potential capabilities sound like something out of science fiction, Grizzle says this mechanical giant will be gentle – and kept on a restraint to control its powerful motors.

With such a detailed plan for the robot's future, Grizzle is optimistic – but still realistic.

"We don't know what will happen," he said, referring to the success of the project. But if the robot's breakthrough

SEE GRIZZLE, C2

## FOSSILS

# Boys dig up piece of ice age history

MCMINNVILLE, ORE. – Charlie Gilpin and Bryant Ashton, two 10-year-olds, were playing recently in a secret hideaway when they helped make a mammoth discovery, literally.

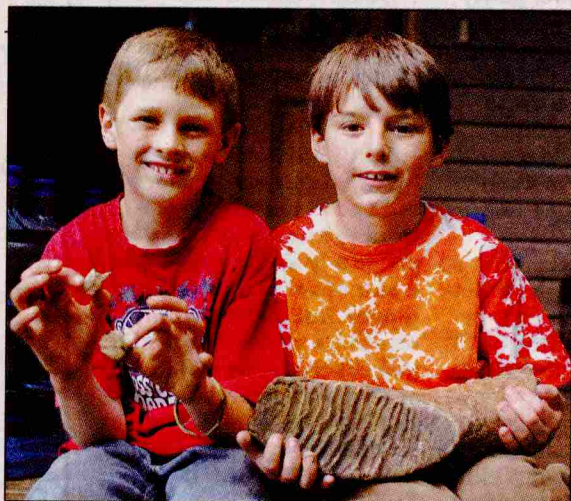
At first, they thought it was a boot sticking out of the mud, said Charlie. In fact, they did nothing for days but spook each other with stories about whose boot it was. A head hiker's? A wanderer who had run into a squatch?

Then the boys decided to give the boot a pull and saw it was no such thing.

It was a 10-pound, geologist-afirmed tooth of an ancient 9-year-old mammoth.

"It's in excellent condition, and that's more exciting is that that tooth that fourth molar – was in the animal when it croaked," said William Orr, director of the Thomas Condon State Museum of Fossils at the University of Oregon.

For the boys, it's been an exciting



OLIVIA BUCKS, NEWHOUSE NEWS SERVICE

Bryant Ashton, left, holds bits of the jaw while Charlie Gilpin displays the mammoth tooth.

time. They've spoken to scores of people – including scientists, teachers, students and journalists – about "the dig" where the boys found the tooth. The boys also have been toting the tooth from class to class at McMinnville's Cook Elementary School. And they say they want to make a map showing where they've already dug and where they plan to dig.

Newhouse News Service

## ENERGY

# Wastefulness does not compute in new energy campaign

It's a measurable energy consumer in most households, and in a workplace, it can suck up enough wattage to affect the bottom line – as much as \$1.75 million annually in a place like the University of Michigan.

Energy-efficient computers are becoming more common, and the city of Ann Arbor and the University of Michigan have committed to being greener and saving money with such programs.

U-M announced recently it is making sure that thousands of computers on campus meet strict standards by participating in the new Climate Savers program.

Climate Savers, started earlier this year by Google and Intel, is a voluntary incentive program designed to help reduce global warming by using energy-efficient computing equipment. Learn more at [climatesaverscomputing.org](http://climatesaverscomputing.org).

U-M is not the only one, however. Ann Arbor's Chief Financial Officer Tom Crawford, who oversees IT services, said the city buys Dell computers that meet federal EnergyStar efficiency standards. Crawford said the city hopes to save \$25 to \$75 per desktop unit annually.

Tom Gantert, News staff reporter



GRIZZLE FROM C1

## Robotics advances could help stroke, accident victims

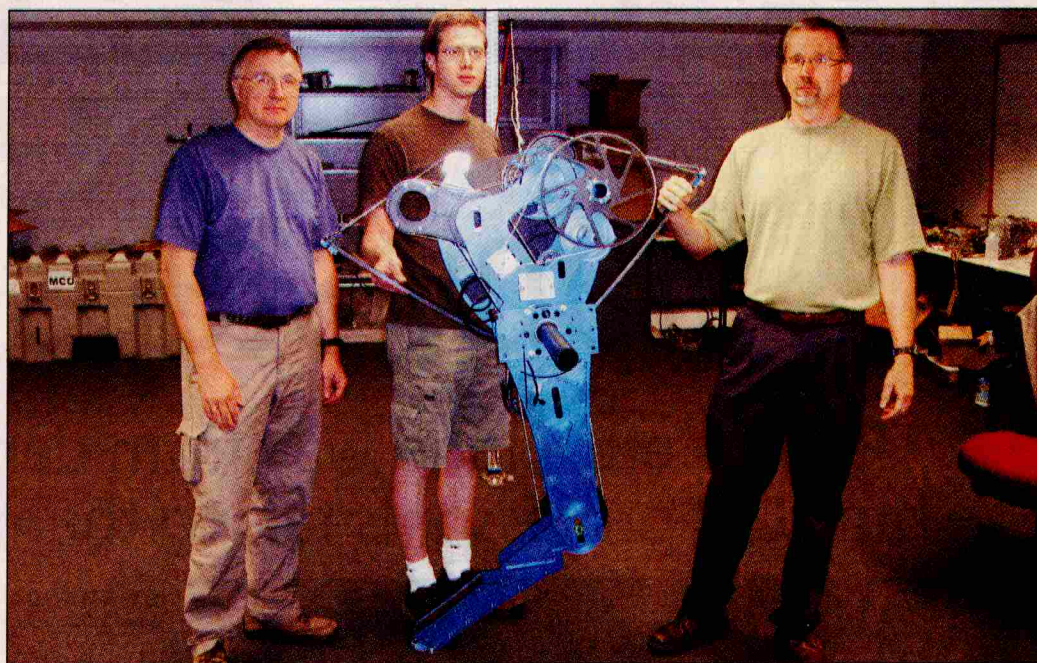
technology works, it "opens up the possibility of machines going where humans can't, like if a factory has an accident and sending in a human (rescue) team isn't safe."

Advances in robotic technology, like the kind Grizzle works with, could yield several other desirable effects, Grizzle said. Understanding bipedal motion could lead to advances in prosthetic limb technology as well as a new outlook on rehabilitation methods for stroke and accident victims.

Although Grizzle's passion lies in the fundamental science of robotics, he said he sees and respects the potential benefits of human-like robots.

But, he said, the robotics industry has to walk before it can run.

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COURTESY OF JESSY GRIZZLE

Jessy Grizzle, right, a professor of electrical engineering and computer science at the University of Michigan, stands with Gabriel Buche, left, and Jonathan Hurst, center. Buche is an engineer from France who helped with the electronics for the robot. Hurst is a Ph.D. student at the Robotics Institute of Carnegie Mellon. He designed the robot and is building it.

## WILDLIFE

# Range-roving wily coyote becomin

Urban sprawl may be attracting the animals

BY JIM SUHR  
The Associated Press

Wile E. Coyote, as a comically ineffective predator, is always good for a laugh. The antics of his real-life kin provoke a different kind of reaction as cities and suburbs in the East and Midwest find themselves in unfamiliar territory.

Some naturalists suspect the ranks of urban coyotes may be swelling as the animals migrate from the open spaces of the West and South-east



COLIN ARCHER, AP

Members of the New Jersey Division of Fish and Wildlife prepare body-gripping snares that will be used in an attempt to catch a coyote in the woods of Middletown, N.J., in May. A 5-year-old boy was bitten near his home in Middletown, the second such attack in the town in less than two months, authorities said.

the Chicago area, the state Department of Natural Resources says.

That's very different from the late 1980s, when perhaps a dozen coyotes roamed the Chicago area, mostly along the agricultural fringes, says Stan Gerht, an Ohio State University assistant professor of wildlife ecology. Gerht's group estimates there may be as many as a couple thousand Chicago-area coyotes.

"The trend is definitely upward," state DNR wildlife biologist Bob Bluett says. "As long as they dodge traffic, they're pretty safe."

Some make themselves right at home. The Quiznos cooler inside the sandwich