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Living Creatures Show Engineers Way To Build Robots

By JAMES EWINGER



Dr. Poramate Manoonpong, of the University of Goettingen in Germany, works on the six-legged walking machine robot he created and demonstrated at Case Western Reserve University. (Photo by Chris Stephens)
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CLEVELAND — Imagine a headless pack mule that eats fossil fuels, a metal spider running over land and water, or a radio-controlled moth orbiting a light bulb.

Dozens of men and women who already imagined these things — and made them — are at Case Western Reserve University this week for the Fourth International Symposium on Adaptive Motion of Animals and Machines.

Living creatures are showing engineers a better way to build machines. These mechanical creatures, in turn, are giving researchers in the natural sciences a better understanding of the animals that inspired them.

Roger Quinn, director of Case's Robotics Lab, and co-chairman of the symposium, said the small robots can explore hostile environments, from volcanoes and collapsed mines to mine fields.

Robotic innovations also can replace missing limbs, or help to rehabilitate stroke victims by exercising or assisting muscles, Quinn said.

On June 2, images were shown of a live moth with a clipped wing to explain how the creature can compensate for the impediment. A video was used of a small robotic dog to demonstrate how four-legged creatures adapt to rough terrain, and there was a presentation about the use of artificial limbs in rough terrain.

Speakers include those with backgrounds in psychology, anthropology, biology, zoology, physiology, electrical and mechanical engineering, and of course, robotics.

Marc Raibert, president of Boston Dynamics, said he and his company created a machine called Big Dog for the Department of Defense. It is a mechanized pack mule, and will not be at the symposium.

"We've been studying how animals do locomotion for a long time," Raibert said in an earlier telephone interview. "People and animals can go anywhere on Earth, whereas wheeled and tracked things are very limited in where they can go."

In fact, the U.S. Army relied on mules as all-terrain cargo carriers well into the 20th Century.

Metin Sitti, with the Robotics Institute and Department of Mechanical Engineering at Pittsburgh's Carnegie Mellon University, is responsible for some small robots inspired by the basilisk lizard, which can run across water.

Engineers are in the business of finding technical solutions, and Sitti

Newhouse Spotlight

The Times

"Everything happens in New Jersey" may seem a bit exaggerated, but a litany of stories down through the years supports the claim. From the Lindbergh baby kidnapping and "Trial of the Century," to the Hindenburg explosion, to Megan's Law, to the post-9/11 anthrax mailings from the local post office, The Times of Trenton has been on top of the stories.

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Kevin O'Hare has been a music writer for the Republican since 1985. His weekly CD and DVD reviews have been distributed by the Newhouse News Service for nearly 20 years.



proposed the water walker as a project for his students.

Sitti also has been involved with the creating of small robots that can climb vertically like a spider. They are suited to exploration and inspection, including the less accessible reaches of buildings and aircraft.

Of course, Sitti admitted, they also have entertainment value.

But the amusement is not shared by all: Sitti said the airlines and airport security "are very tough on these electronic devices."

(James Ewinger is a reporter for The Plain Dealer of Cleveland. He can be contacted at [jewinger\(at\)plained.com](mailto:jewinger@plained.com).)

[[Back](#)]