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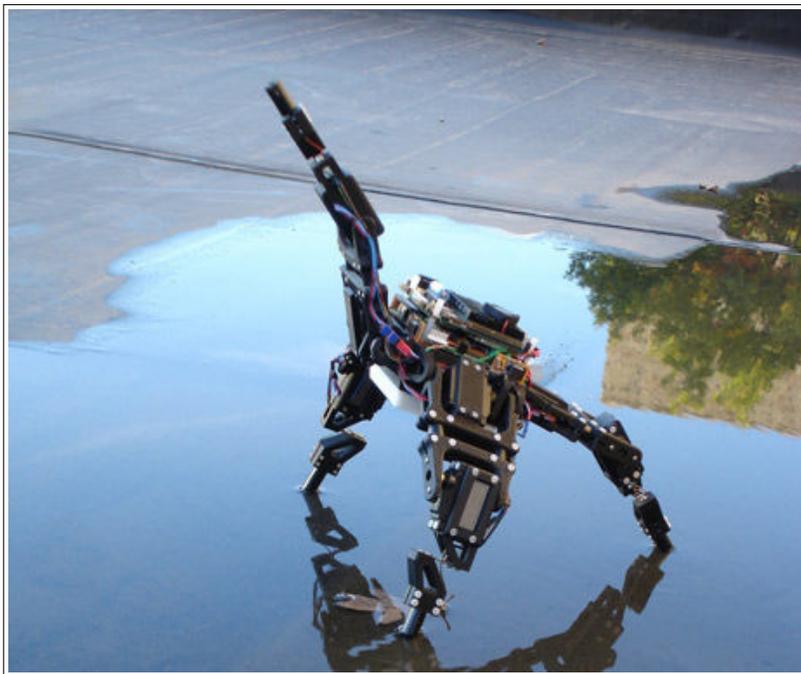
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Photo in the News: Robot Senses Damage, Learns to Walk Again



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November 17, 2006—It may look like a metallic [starfish](#), but scientists say this robot might have more in common with a newborn human.

The four-legged machine is a prototype "resilient robot" with the ability to detect damage to itself and alter its walking style in response.

Josh Bongard, an assistant professor of computer science at the University of Vermont in Burlington, and his colleagues created the robot as part of a NASA pilot project working on technology for the next generation of planetary rovers.

While people and animals can easily compensate for injuries, even a small amount of damage can ground NASA machinery entirely.

"The main goal for this project was to try and build a robot that was able to

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diagnose, or figure out, when it had been damaged, how it had been damaged, and to recover from that damage," Bongard said in a press statement.

According to Bongard, the machine knows that it is made with nine parts. But the robot "doesn't know how the parts are put together," Bongard said. "The robot doesn't know it's a four-legged machine. That's something [it] initially figures out for itself."

By being "curious" and interacting with the environment, the robot can create an internal model, or "body image," of itself, which it then uses to simulate various walking gaits.

By repeating this process, the robot, when damaged, can quickly detect the change in its body shape and simulate entirely new gaits before choosing one to use in real life.

And a resemblance to the way a baby takes its first steps may not be a coincidence. Even though the research team hasn't yet gone over their results with biologists, Bongard said, this is what "could be going on in the mind of a newborn baby or newborn animal."

The new robot is described in today's issue of the journal *Science*.

—Aalok Mehta

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