

1 of 6 6/1/11 2:08 PM

of sleep on pole vault landing pads at one point.

The long walk bested the team's previous record set in July 2010, in which Ranger covered 14.3 miles. Prior to that, Boston Dynamic's Big Dog, a four-legged robot, had gone 12.8 miles without refueling.

Advanced stamina

The advance in Ranger's stamina comes from an improved controls algorithm, electronics and energy efficiency, the team said.

The 22-pound robot, outfitted with a red Cornell baseball cap for its walk, has six onboard computers and dozens of electrical and mechanical sensors. Motors extend the outer and inner ankles, and a third swings the legs. A fourth motor twists the inner legs for steering.

"A difference between (Ranger) and most robots is that it has rounded feed and not flat feet," Ruina said. "So most robots, almost all Japanese robots, they can stand upright ... This one can't do that. If you tried to stand it up, it would just tip over."

Ranger achieves balance by falling and catching itself with each step. In fact, the team had a side bet going about how Ranger would end up when its charge finally expired. Three members thought it would fall on its face, three thought it would fall on its back. "I bet standing up and I won," Ruina said.

All told, the robot requires 16 watts to run. When calculated on a scale called of transport (COT) that takes into account weight and speed, Ranger uses 0.28 joules per netwon-meter. For comparison, most robots have a COT of 1.5 or more. Humans walk with a COT of about 0.2. A Toyota Prius is about 0.08.

Efficient walking

philosophy."

Ranger's energy efficiency stems from its original design. Ruina started building machines that could walk down gentle slopes without a motor at all then adding the power needed to allow it to walk along a flat surface. "In the end, it got much more sophisticated than that, but that was the starting

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Going forward, the team hopes to build a more human-like

bipedal robot that has to contend with side-to-side balance and fore-and-aft balance. Such a robot, Ruina said, would help him achieve his overall goal of explaining how humans walk with the laws of physics.

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"It should be that you can explain how people walk somehow in terms of Newton's laws. And what we see is that people somehow walk using very little energy so there should be some way of using Newton's laws to understand people as if they are a machine that uses very little energy," he said.

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2 of 6 6/1/11 2:08 PM

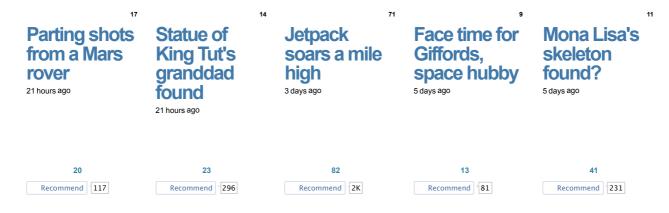
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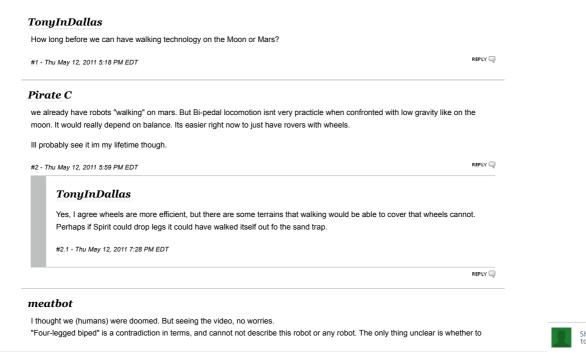
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3 of 6

call it quadrupedal or tripodal. The four legs are in a row, but the middle two move together. It walks more like a person on crutches would. At least it stopped gracefully when the battery ran out, like the pumps at Fukushima Daiichi. REPLY 🗐 #3 - Fri May 13, 2011 3:15 AM EDT XDisk-3474938 Aside from the power consumption, what's the big deal. It's not a quadruped, it only has three legs. Plus if you pay attention, there's a guy following it controlling it with a remote control. What's the big deal? a really efficient remote controlled toy robot? X. REPLY 🔲 #4 - Sun May 15, 2011 9:55 AM EDT **TonyInDallas** I think it's called a "prototype". #4.1 - Tue May 24, 2011 3:51 PM EDT REPLY 🗬 Leave a Comment: Name: Email Address (will be verified, but never shown): You're in Easy Mode. If you prefer, you can use XHTML Mode instead. older newer Newsvine Privacy Statement Post Comment As a new user, you may notice a few temporary content restrictions. Click here for more info. Start Tracking Stop Tracking Back To Top | Front Page

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4 of 6 6/1/11 2:08 PM