ROBOTICS

Ranger robot breaks its own endurance record

By Ben Coxworth

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2 Pictures

Cornell University's Ranger robot has beaten its own endurance record, by walking 40.5 miles on a single charge (Images: Cornell University)

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On July 6th of last year, Cornell University's Ranger robot set a world record for untethered legged robots – it walked 14.3 miles (23.01 km) in about 11 hours on a single charge, with no hands-on assistance. The record had previously been held by Boston Dynamics' BigDog, when it walked 12.8 miles (20.6 km). Both of those achievements were eclipsed last Monday (May 2nd), however, when Ranger beat its own record by walking a whopping 40.5 miles (65.18 km) on a single charge.

The robot walked around an indoor oval track, and was steered by students, faculty and staff via a radio-control unit. It started out just after 2 pm on May 1st, and proceeded to cover 307.75 laps at a speed of 1.3 mph (2.09 kph) over the next 30 hours, 49 minutes and 2 seconds.

Ranger's energy-efficient design incorporates a rigid-legged swinging gate, in which it is constantly in a state of falling forward and catching itself before it goes down. By contrast, many other walking robots have joints in their legs and throughout their bodies, which must be powered continuously in order to maintain balance.

The current version of Ranger uses six pounds of lithium-ion batteries to power four motors, which along with the onboard electronics consume a total of 16 watts. The robot's cost of transport (energy per unit weight per unit distance) sits at 0.28 joules per newton-meter. Humans are more efficient, with a COT of about 0.2, although most robots come out at around 1.5. Even Ranger itself was less efficient in its 2010

record-breaking walk, at which time its COT was 0.49.

According to Cornell professor of mechanical and aerospace engineering Andy Ruina, who built and programmed the robot, the purpose of the Ranger project is to better understand walking by reinventing it.

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Impressive leap in technology.

Michael Mantion - *May 14, 2011 @ 02:24 pm PDT*

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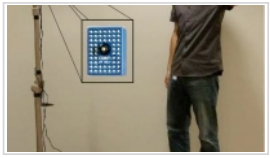

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