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## Cornell University robot walks into the record books

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By **Hart Seely / The Post-Standard**

Provided photo

Cornell University graduate student Pranav Bhounsale operates Ranger, a four-legged robot that walked 14.3 miles, setting an unofficial world walking record for a robot.

On July 6, a four-legged metal skeleton known as “Ranger” sauntered 14.3 miles around the indoor track at Cornell University’s Barton Hall — setting the unofficial world walking record for a robot. Leading the project was Cornell professor of theoretical and applied mechanics, Andy Ruina. He spoke with staff writer Hart Seely.

### Did it have a joystick?

The joystick did the steering. It was a \$25 hobby remote control. The walking control was onboard, but it was steered by a person, (lab manager)

Jason Cortelle. I was in Finland, watching on a computer video. The walk ended at 12:48 in the morning in Ithaca, which was 7:48 in the morning in Finland. I stayed up all night, watching.

### It must have been riveting to watch.

Well, 108 times around the track — I don’t know if “riveting” is the word. It was nerve-wracking toward the end, because we weren’t sure if it would go far enough.

### What’s the trick to getting a robot to walk?

There’s a singer named Laurie Anderson, and she has a song called “Walking and Falling,” and the secret is really in the words of her song, which goes, “With each step you fall forward and then you catch yourself from falling, over and over. ... And this is how you can be walking and falling at the same time.”

That really is the trick. You set yourself up for another fall, and then you catch yourself. We think that’s how people do it, too.

**That's heavy.**

You should listen to the song. It's very philosophical.

**I know the song, "I Hope You Dance." Ever hear that one? "When you get a chance to sit it out or dance, I hope you dance?"**

Was that Laurie Anderson?

**Somebody else. It was a big hit.**

Uh-huh.

**I don't know if it works for robots.**

Well, this one doesn't really have a tune. She just talks in a pretty profound way.

**In a nutshell**

**Who:** The Cornell Ranger

**Why he(?) is in the news:** Ranger set the new world robot walking record.

**Which is:** 14.3 miles or 70,000 steps, 108 times around the indoor track at Cornell's Barton Hall.

**For more information:** Go to **Andy Ruina's website**

**Why the interest in a walking robot?**

There are two answers. ... The reason I'm interested is that it's a cool challenge. Why is it that no one has made a good walking robot yet?

...Also, it's an indirect but legitimate way to understand how people walk. You can see how people walk by studying walking, measuring how big the steps and the forces are, but what you can't see is what's the problem: Why is it hard to walk, why can some people do it and some people can't?

You can't really understand the problem unless you try to design it yourself. That's what I think is the actual use of the research.

**Will robots someday walk our dogs?**

I just went to a big robot meeting, and a lot of the people at that meeting have a science fiction view of robotics. They think they're going to see robots doing useful things, serving people and so on. I'm not in that school. I think it's pretty unlikely.

**You don't think we'll have robots like the butler in the Jetsons?**

People have those different images. One is that butler in the Jetsons. One is the emergency firefighter who can do a job without putting people in danger. One is the soldier: You can kill your enemies without risking your life. And the social companion: They walk with you, they chat with you, something like that.

I don't see any of those things likely.

...I could be wrong. Maybe if we build really great and cheap robots, they'll be handing us coffee and walking our dogs. But usually, when you think about a given problem — walking your dog or putting out fires — there's a much better solution than a machine that's shaped like a person.

### **How fast does it move?**

It went a little over 14 miles in a little over 10 hours. So that's like 1.4 miles an hour.

### **Not fast.**

It's a pretty slow walk. ... It's the kind of way you would walk if you were in love and holding a martini, not the walk you'd use if in a hurry to get someplace.

### **How would this do on uneven terrain?**

A half-inch bump would more likely knock it down. Now, a half-inch bump will knock down a person who is not paying attention, too. That will trip you on the sidewalk. But people have eyes, and they look for those bumps. This robot is not looking for the bumps, and so just little bumps will trip it.

Big Dog (the previous robot walking champion, from Massachusetts) has a big gasoline engine and takes very high steps. It can go over bumps that are several inches high, but the price they pay is a 25 horsepower motor, which makes a huge amount of noise.

### **They were thinking of a different country-western song.**

Yes, they were.

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