

MIT engineers have high hopes for cheetah robot

December 1 2014, byRodrique Ngowi



In this Sept. 30, 2014 photo, researcher Hae Won Park plugs the batteries into a robotic cheetah at the Massachusetts Institute of Technology in Cambridge, Mass. MIT scientists said the robot, modeled after the fastest land animal, may have real-world applications, including for prosthetic legs. (AP Photo/Charles Krupa)

It's a robot unlike any other, inspired by the world's fastest land animal and controlled by video game technology.

The [robot](#), called the cheetah, can run on batteries at speeds of more than

10 mph (16 kph), jump about 16 inches (40 centimeters) high, land safely and continue running for at least 15 minutes—all while using less power than a microwave oven.

It's the creation of researchers at the Massachusetts of Technology, who had to design key elements from zero because of a lack of, or shortcomings in, existing technology.

That includes powerful, lightweight motors, electronics that control power for its 12 motors and an algorithm that determines the amount of force a leg should exert during the split second that it spends on the ground while running. That's the key to helping the robot maintain balance and forward momentum.

An onboard computer organizes data from various sensors and sends commands to each motor.

"This is kind of a Ferrari in the robotics world, like, we have to put all the expensive components and make it really that instinctive," said MIT Professor Sangbae Kim, who heads the school's Biomimetic Robotics Lab that designed the robot. "That's the only way to get that speed."

Insight gleaned from the prototype could have real-world applications, including the design of revolutionary prosthetics, wearable technologies, all-terrain wheelchairs and vehicles that can travel efficiently in rough terrain much like animals do, Kim said. There are hopes the robot will be able to be used in search and rescue operations in hazardous or hostile environments where it's too risky to send a human rescuer.



In this Oct. 24, 2014 photo, a robotic cheetah runs on an athletic field at the Massachusetts Institute of Technology in Cambridge, Mass. MIT scientists said the robot, modeled after the fastest land animal, may have real-world applications, including for prosthetic legs. (AP Photo/Charles Krupa)

"When the robot is running, at every step, we calculate the appropriate amount of the force to the legs so that the robot can balance itself," said MIT research scientist Hae-Won Park, who wrote the complex algorithm used to control the cheetah, which weighs around 70 pounds (31 kilograms)—about the same as one of its female feline counterparts.

The project is funded by the U.S. Department of Defense's Defense Advanced Research Projects Agency. The military research arm is also funding a similar robot being developed by Boston Dynamics. The company says its version is powered by an off-board hydraulic pump and uses a boom-like device to keep it running in the center of a treadmill.

Crafting the cheetah robot took five years of work and plenty of confidence to ignore those who said electric motors aren't strong enough

to propel a running mechanical cheetah powered by batteries.



In this Sept. 30, 2014 photo, researcher Hae Won Park works on the software for a robotic cheetah with a game controller at the Massachusetts Institute of Technology in Cambridge, Mass. MIT scientists said the robot, modeled after the fastest land animal, may have real-world applications, including for prosthetic legs. (AP Photo/Charles Krupa)

Researchers continue to tweak their prototype, looking to add additional sensors that would eventually make the robot autonomous.

"In the next 10 years, our goal is we are trying to make this robot to save a life," Kim said.



In this Sept. 30, 2014 photo, professor Sangbae Kim controls a robotic cheetah on a treadmill at the Massachusetts Institute of Technology in Cambridge, Mass. MIT scientists said the robot, modeled after the fastest land animal, may have real-world applications, including for prosthetic legs. (AP Photo/Charles Krupa)



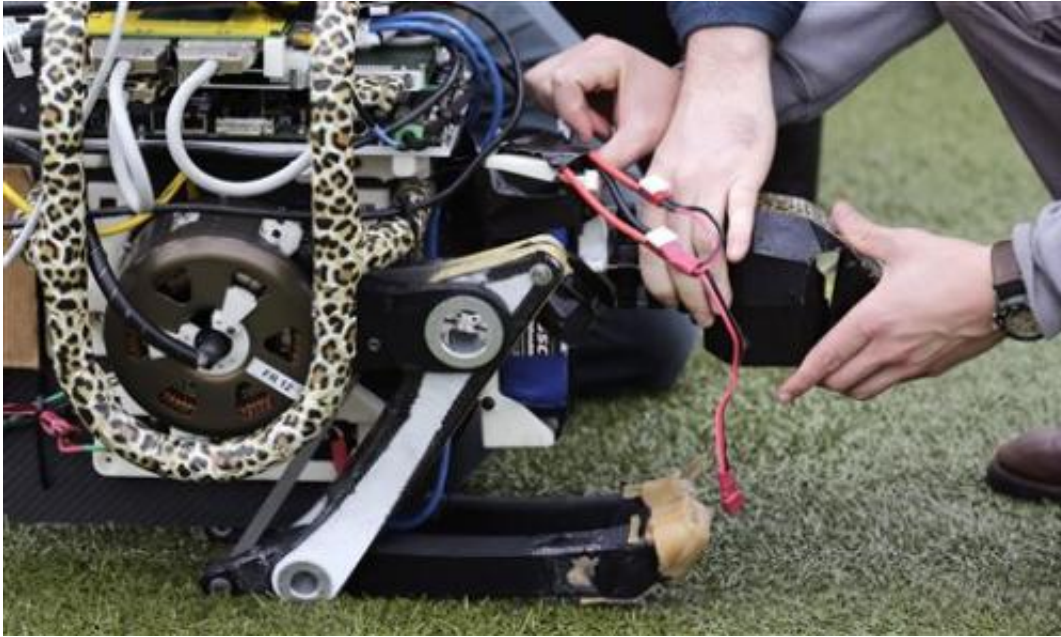
In this Oct. 24, 2014 photo, researchers Randall Briggs, left, and Will Bosworth monitor a robotic cheetah during a test run on an athletic field at the Massachusetts Institute of Technology in Cambridge, Mass. MIT scientists said the robot, modeled after the fastest land animal, may have real-world applications, including for prosthetic legs. (AP Photo/Charles Krupa)



In this Oct. 24, 2014 photo, researchers stand beside a robotic cheetah on an athletic field at the Massachusetts Institute of Technology in Cambridge, Mass. MIT scientists said the robot, modeled after the fastest land animal, may have real-world applications, including for prosthetic legs. (AP Photo/Charles Krupa)



In this Oct. 24, 2014 photo, a robotic cheetah rests at the feet of researcher Randall Briggs on an athletic field at the Massachusetts Institute of Technology in Cambridge, Mass. MIT scientists said the robot, modeled after the fastest land animal, may have real-world applications, including for prosthetic legs. (AP Photo/Charles Krupa)



In this Oct. 24, 2014 photo, researchers adjust the head of a robotic cheetah on an athletic field at the Massachusetts Institute of Technology in Cambridge, Mass. MIT scientists said the robot, modeled after the fastest land animal, may have real-world applications, including for prosthetic legs. (AP Photo/Charles Krupa)

More information: MIT Biomimetic Robotic Lab:
biomimetics.mit.edu/

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Citation: MIT engineers have high hopes for cheetah robot (2014, December 1) retrieved 28 April 2024 from <https://phys.org/news/2014-12-mit-high-cheetah-robot.html>

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