

Fall madness: MIT's Mini Cheetah robots play soccer

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The Nov. 6 video posted by Biomimetics Robotics Lab at Mass Institute of Technology in Killian Court does not need a text narrative and it has none, but that won't stop you thinking along the lines of in-video bystander reactions: "Oh God." "Whoooo."

Nine mini cheetah robots pass before your eyes on the lawn of MIT.

They take position and proceed to play a game of soccer. After that, some jaw-dropping showoff athletic moves follow, where they do backflips, team-warm-ups and engage in assorted knock-downs.

Graham MacAree in [SB Nation](#) weighed in: "They play some soccer, very badly. This is despite having four legs, which I can only assume would make soccer much easier. But they also do synchronized standing backflips from a quadrupedal position, which is so far beyond my capabilities that I think I pulled a muscle just watching."

As the video shows, the robots are untethered. Quadruped robots have been in development at the Lab for years, and the team has created three versions of a cheetah [robot](#) in addition to the mini cheetah version.

Darrell Etherington [said](#) in *TechCrunch*: "The mini cheetah is a shrunk-down version of the Cheetah 3, a much larger and more expensive to produce robot that is far less light on its feet, and not quite so customizable."

Actually, one is reminded of the dimensions of a dog and they resemble dog-like robots; they scamper around like dogs but the professor who is part of this effort had a different story, told by Bronte Lord in [CNN Business](#). Lord quoted MIT Associate Professor of Mechanical Engineering Sangbae Kim, who said his hobby was watching cheetah videos on YouTube.

Bonnie Burton in CNET said the team was focused on adding skills to the mini cheetah. "They're considering adding cameras so the robots could navigate through space without someone operating them."

Burton [wrote](#) that each robot weighs around 20 pounds (9 kilograms), is powered by 12 motors and achieves speeds of about 5 mph. Also, the mini cheetah has to make more 30 decisions per second to keep itself

upright. Burton commented how "That versatility, and resilience if it falls, are what make this robot special—and very good at backflips."

What a difference an inexpensive, lightweight mini-version makes. "The mini cheetah was designed for Lego-like assembly using off-the-shelf part, as well as durability and relative low cost," Etherington said. "It can walk both right-side up, and upside down, and its most impressive ability just might be the way it can manage a full backflip from a stand-still. It can also run at a speed of up to 5 miles per hour."

Contrast that with the features described in a 2018 [article](#) in *Newsweek*: "Cheetah 3 is a 90-pound robot that resembles the frame of a Rottweiler and can run 13 feet per second, a carefully calculated speed, slow enough so the device remains stable when moving. It can apply force and detect when it needs to apply pressure to perform a certain task."

That third prototype could leap and gallop across rough terrain, climb a staircase littered with debris and recover balance when pushed, all while essentially blind, said *Newsweek*. The robot could be used in war zones or sent to [power plants](#) in potential disasters.

What's next?

According to the CNET report, Sangbae Kim has ideas on how the team can test the mini-version robots further. The setting will be an obstacle course. "Eventually, I'm hoping we could have a robotic dog race through an obstacle course, where each team controls a mini cheetah with different algorithms, and we can see which strategy is more effective," Kim added. "That's how you accelerate research."

Etherington wrote that "Researchers working on the robot set out to build a team of them after demonstrating that first version back in May, and are now working with other teams at MIT to loan them out for

additional research."

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