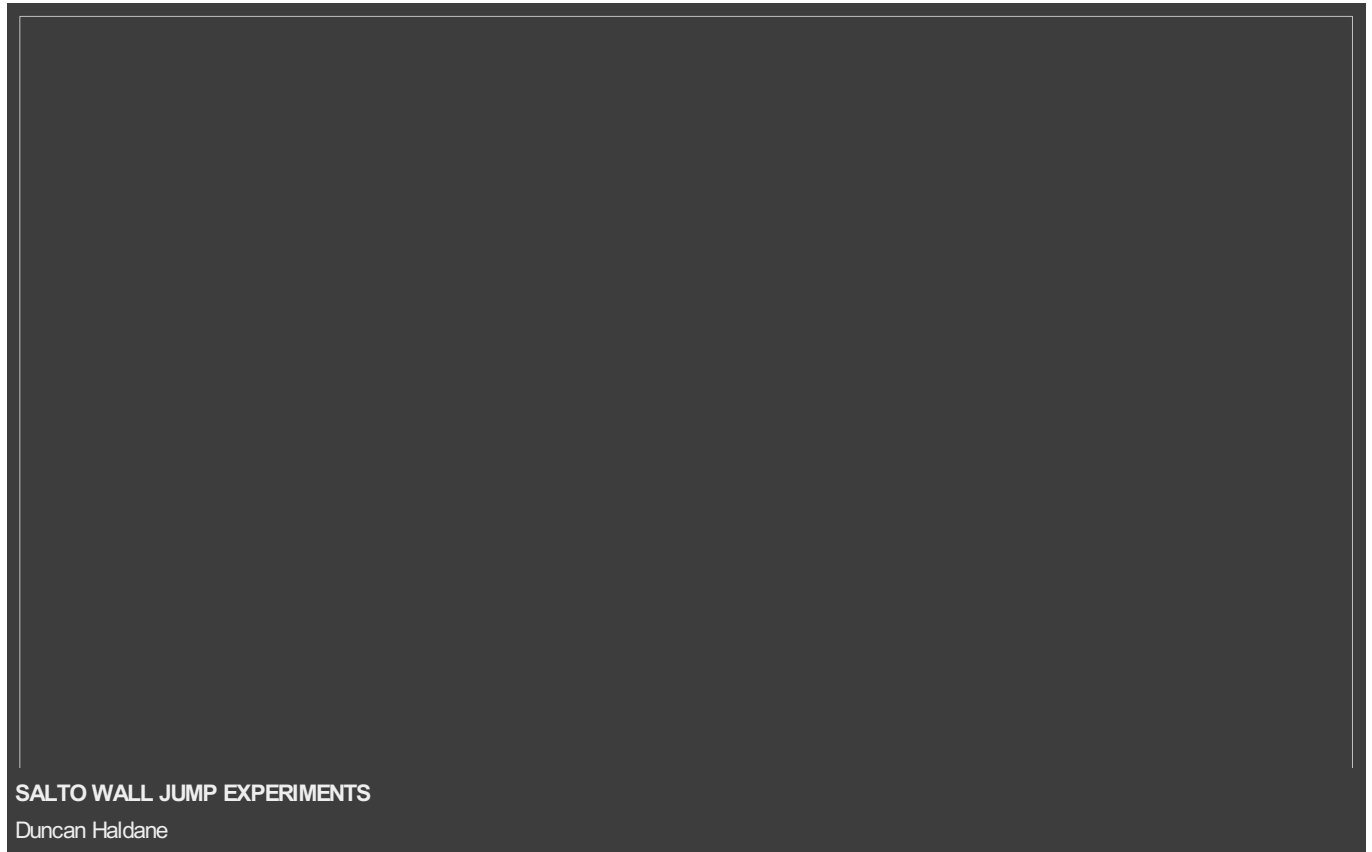


# Parkour robot bounces off walls to gain height

One-legged machine reloads its springs fast enough to perform jumps in quick succession.

[Davide Castelvecchi](#)

06 December 2016



## SALTO WALL JUMP EXPERIMENTS

Duncan Haldane

Meet Salto, a one-legged robot that jumps off walls with the ease of a [parkour athlete](#). Such agility could prove crucial in disaster scenarios, in which [searching for survivors or inspecting damage](#) can require [navigating uneven terrain](#)<sup>1</sup>.

Salto is not the highest-jumping robot ever. But the springs in earlier machines<sup>2</sup> typically took a while to reload. Salto, by contrast, can reload in just 120 milliseconds, fast enough to produce multiple jumps in a row, and in particular, to reach higher by rebounding off a wall — a trick also deployed in parkour.

“When it’s contacting the wall, the motor pumps more energy into the system,” says Duncan Haldane, a mechanical engineer at the University of California, Berkeley. “It’s not just bouncing off the wall.”

### Primate guidance

To create Salto, Haldane and his collaborators took inspiration from one of nature’s best jumpers, a small African primate called a galago (*Galago senegalensis*). Before taking a leap, galagos crouch to load energy in their stretched tendons. When they spring, they get 15 times more acceleration than if they used muscle force alone. Salto emulates that biomechanical feat thanks to the latex spring between the robot’s motor and its leg.

The robot, whose name comes from the Latin verb *saltare*, which means ‘to jump’, stands about 30 centimetres tall with its thin leg stretched out — and can jump to a maximum height of 1 metre in a single leap. So far, it can only do two jumps in a row because it lacks the ability to stabilize itself in three dimensions, but Haldane says that future versions will fix that.

Practical applications are further off, and a useful machine would probably need two legs to walk as well as jump, say the researchers. Haldane’s team published its results on 6 December in *Science Robotics*<sup>1</sup>.

## References

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1. Haldane, D. W., Plecnik, M. M., Yim, J. K. & Fearing, R. S. *Sci. Robot.* **1**, eaag2048 (2016).
2. M. Kovac, M. *et al.* *IEEE International Conference on Robotics and Automation* 373–378 (2008).

## 1 comment

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Albert Stienstra · 2016-12-08 06:34 PM

A pity I could not see the robot jump...I will not use Adobe Flash anymore; I'm surprised nature.com still uses this technology. HTML5 has been out for years now.

