

# Simple Robot Climbs Through Tubes (w/ Video)

May 12 2010, by Miranda Marquit

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Last week was the IEEE's International Conference on Robotics and Automation, held in Anchorage, Alaska. One of the most interesting robots was a simple -- and fast -- bot designed to climb easily through tubes.

This small [robot](#), created at Carnegie Mellon's Biorobotics lab and the Manipulation lab, uses vibration to help it move quickly up tubes. IEEE Spectrum reports on how the [robot](#) works:

*The result is this little device. It's simple motor turns an unbalanced mass at a uniform velocity. As the mass swings around, it causes the robot to bounce back and forth between the tube walls. Two rubber o-rings let the researchers specify the exact contact points and increase friction with the walls.*

Instead of using bristles or fibers, and vibration that moves the robot in a low-friction direction, the o-rings provide a little more control for the robot's operators. And, the design employed by Carnegie Mellon also overcomes another design flaw common to tube climbing robots of the past: Difficulty getting out of the tube. Because of the way robots designed with bristles and fibers use the lowest-friction direction to climb the tube, operators have to work against maximum [friction](#) to remove the bot. With the o-ring design, this is no longer an issue.

In addition to easier removal, the Carnegie Mellon bot also features a payload capacity of five times its weight. Depending on the size of the

tube, this robot can move up to 20 body-lengths per second. The versatility of this robot could lead to a number of different applications, especially for those that require that quick navigation of 3D tubes.

**More information:** Josh Romero, "Simple Vibrating Bot Climbs Tubes With Ease," IEEE Spectrum (May 7, 2010). Available online: [spectrum.ieee.org/automaton/robotics/robotics/tube-climbing-robot](http://spectrum.ieee.org/automaton/robotics/robotics/tube-climbing-robot) .

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