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OBSERVATORY

## Nine-Inch Robot Walks Like a Man, Climbs Hills Too

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Compared with a human, the typical two-legged walking robot can make only baby steps. That's because people have a better biomechanical system (legs, hips, etc.) and more complex neuronal control over it. A bipedal robot may be able to walk on a smooth, level surface, but throw in a few bumps or hills and it is likely to fall flat on its silicon posterior.

Researchers at the University of Göttingen in Germany are reporting progress in developing a robot that can adapt to different terrain, adjusting its gait and posture after a few learning experiences.

The 9-inch-high machine, called RunBot, has already been shown to be able walk at a good clip (about 3.5 leg lengths per second, compared with a sprinter's 4 to 5 per second). But in a [paper](#) in the open-access online journal PLoS Computational Biology, Florentin Wörgötter and colleagues describe its adaptive capabilities.

The robot has ground-contact sensors on its feet and motors at its knees and hips that are controlled through a series of electronic circuits that simulate receptor and motor neurons. There are two levels of control — a basic, almost reflexive control that occurs in reaction to the foot sensors, and a higher-level control that takes into account, among other things, the timing of signals in the system.

With these dual control levels, RunBot can do things like adapt to terrain with bumps and depressions, and adjust its gait and posture to walk up an 8-degree slope. When walking uphill it's not immune to falling on its backside, but unlike other robots it learns after a couple of falls.

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