

Bipedal Atlas is able to sort out where to step amidst messy rubble

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(Tech Xplore)—Humanoid robot Atlas is back. On the go again. Lots of attention has been paid for some time over how this bipedal robot shows promise. Robotics experts are showing Atlas act out their mission to have the robot perform realtime tasks in events of disasters calling for search and rescue.

We left off in February with a nex-gen Atlas walking in the woods.

That time around Atlas was even more like us than as a clunky noisy [robot](#). We saw the new-gen Atlas walk forward and [pushing a heavy glass door to go outside](#) of its lab. In the snowy outdoors it walked, successfully, over the mounds of snow.

Atlas has walked impressively for along time but showing its stuff on a smooth treadmill is one thing. The true test of Atlas has been how it manages to walk in real life environments where there might be numerous obstacles and rubble.

How can it manage? Chaim Gartenberg in *The Verge* said this has been one of Atlas' major problems, walking on uneven terrain.

The latest video is encouraging. Atlas is in good form. The video shows the robot walking over small and partial footholds. It can handle small stepping stones and line contacts.

More specifically, the lab team, said Brian Heater in *TechCrunch*, "has developed a system by which the robot can navigate across a series of different surfaces of different sizes and geometries – in the case of the featured video, mason blocks that have been turned on their sides and at various angles, so in some cases the robot has little more than a corner on which to step."

This is the work of the Florida Institute for Human & Machine Cognition (IHMC). This is an interdisciplinary group strengthened by people with expertise in mechanical engineering, electrical engineering, computer science, mathematics, physics, human factors and interface design.

They have been involved in the advancement of robotic capabilities.

Heater said, "The project is one of a series of bipedal walking projects being undertaken by the institute."

Essentially, the Florida team has taught Boston Dynamics' Atlas humanoid robot "to walk [gingerly](#) over rubble," said the story headline in *TechCrunch*.

New Atlas said that IHMC "has loaded up a new algorithm that allows the [bipedal](#) bot to traverse tricky terrain."

The robot explores its next footholds, shifting weight around its foot. To maintain balance, said the team, they combined stepping with the use of angular momentum (lunging of the upper body). The control algorithm was developed at IHMC, and the robot was built by Boston Dynamics.

Prior to stepping, said the video notes, there is no prior knowledge of the upcoming contact geometry. This is what makes the video so interesting. We can see the robot testing each step difficulty, one foot at a time, shifting its weight before finally applying it to a foothold.

Gartenberg talked about this in *The Verge*: "The [new algorithm](#) allows the robot to maintain its balance as it walks over the scattered cinder blocks by dynamically testing the terrain and adjusting its foot position and weight [distribution](#) to avoid falling, just like real, live humans do."

The IHMC site comments on the technical challenges they seek to address in bipedal walking robots.

"While great strides have recently been made in robotics, robots still cannot get to the same places that people can," they said. "Our humanoid projects are focused on enabling our bipedal humanoids handle rough terrain without requiring onboard sensors to build a model of the terrain. We also focus on robustly handling external disturbance. Our goal is to

tackle increasingly more difficult walking [challenges](#)."

In watching the video, you may note that the robot is slow. Gartenberg in *The Verge* wrote, "it could only be a matter of time before it can walk or even run on any kind of non-level surface."

More information: robots.ihmc.us/

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