

Texas researchers re-engineer vintage toy to walk right out of 3D printer

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Rowdy the Roadrunner just got re-engineered for the 21st century. The feisty blue and orange bird has been the University of Texas San Antonio's official mascot since 1977, proudly representing the UTSA Roadrunners' various varsity teams. Soon, however, students may see a new version of Rowdy strutting around campus: a 3D printed walking toy that is comes out fully-assembled and can practically walk right off the 3D print bed.



The '[Rowdy Walker](#)' is based on the ramp walker, an antique toy model that dates back as far as the 1930s. Made out of wood, traditional ramp walkers are made of three pieces: a body with a fixed leg, a moving leg, and a hinge-joint that attaches the two.

As the name implies, ramp walkers do require some kind of downhill incline in order to get the momentum that they need, since they have no inner mechanics, such as a windup spring. However, when placed on a small ramp, the combination of inertia, mass distribution, and leg geometry make it seem as though they are 'walking' downhill all on their own.

"Just like a windup toy uses potential energy stored in a spring, the walking toy uses potential energy as it

descends downhill,” explained Pranav Bhounsule, assistant professor of mechanical engineering, and supervising faculty member on the project. “However, unlike a windup toy that has an intricate mechanism, the walking toy relies on its: mass distribution, inertia, and leg geometry to amble downhill.”

Video of vintage ramp walker toy

For the updated and improved Rowdy Ramp Walker, researchers at UTSA turned to 3D printing technology. Using 3D modeling software, they were able to re-engineer the antique toy’s construction so that it could be 3D printed as a single, integrated piece instead of three separate ones. With only a bit of post-processing—removing the supporting material that holds the leg in place—the mascot is ready to strut its stuff.

3D modeling and 3D printing played an important role in the project, as it gave the researchers the freedom to play around with the physics and aesthetics. “I wanted to make a toy that was based on the UTSA mascot, Rowdy, and 3D printing allowed me to tune the geometry and mass distribution without having to compromise the likeness of the logo,” explained Christian Trevino, a mechanical engineering graduate student and lead project researcher.

In a short time-lapse video (below), the researchers demonstrate the toy being 3D printed on an Ultimaker 3D printer, the support structures being removed, and finally, the bird’s face being hand-painted with UTSA’s signature colors. After that, it’s as simple as placing him on a ramp, and off he goes.



Over at MIT, CSAIL researchers have also been working on [3D printed robots that can walk right out of the 3D printer](#)—their ‘printable hydraulics’ project demonstrates a first-of-its-kind method for 3D printing functional robots from solid and liquid materials at the same time, resulting tiny, 3D printed hydraulic powered robots that can move autonomously with virtually no assembly.

Though perhaps more fun than entirely practical, the 3D printed Rowdy Walker is a great example of how 3D printing technology can be used to re-engineer and re-invent classic physics phenomena. Trevino, who aspires to be an entrepreneur, also sees a potential market for selling his 3D printed mascots as retro campus souvenirs. “I showed the toy around to people on campus and they wanted to know where they could buy one,” said Bhounsule.

The only limitation, at the moment, is that desktop 3D printing remains quite slow—a single Rowdy Walker takes up to 12 hours to complete. Yet as the technology progresses, this soon won’t be a problem, and soon we could see an army of walking Rowdy’s taking over the opponent’s field. Watch the video below to see the 3D printed walking toy in action:

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