

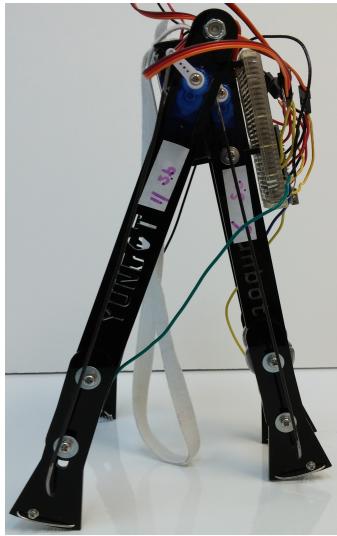
## Constructing an Actuated Passive Walker

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### Research

#### Title: Constructing an Actuated Passive Walker

Locating the region of balance stability is a major concern in studying the dynamics of different bipedal robots. One type of a bipedal robots is a passive walker that relies on changes in gravitational potential energy to propel itself in a dynamically balanced gait, a continuous state of falling, catching, and then righting itself. Unlike other bipedal robots, passive walkers are the most accessible for studying the complexities of the gait cycle, as they exhibit both under-actuated degrees of freedom and dynamic stability with the simplest possible design. In this study, based on an open-source actuated passive walker, Rando, and using open source hardware and software, Ms. Rust created an actuated passive walker. She carefully analyzed and constructed the robot after making multiple design improvements to yield a lightweight frame with even weight distribution.

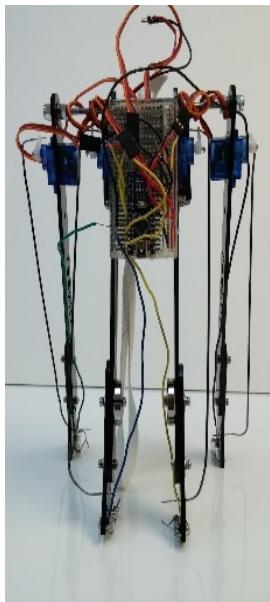


**Figure: An actuated passive walker**

### Lesson Plan

#### Title: Constructing an Actuated-passive Walker

In this lesson, students will be presented with a semester-long “Maker challenge” asking them to design and engineer a walking robot. They will work in groups to provide drawings and descriptions of their designs and explore possible refinements based on scientific concepts, group discussion, and teacher input.



**Figure: Constructing a passive walker**