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MIT's 'Orbit Weaver' Turns Astronauts into Spiders

Moving around in microgravity is tough, but a new MIT Media Lab device takes a page from Spiderman to help astronauts navigate while weightless.

By [Daniel Oberhaus](#)

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IMAGE: STEVE BOXALL/MIT MEDIA LAB

It's easy to get lost in a rabbit hole of videos of astronauts doing stunts inside the International Space Station, the only permanent human habitat where a lack of gravity is the rule rather than the exception. Here's a [video](#) of astronauts doing backflips. Here's one of them [eating candy corn](#). Here they are making [water bubbles](#).

It all looks like fun and games until you consider how hard it would be just to move from point A to point B in a zero G environment. According to [British astronaut Tim Peake](#), this is mostly accomplished by pushing off the walls or crawling with the help of handrails. In the narrow confines of the Space Station this works well enough, but in a larger craft it may be more difficult to control the direction of an astronaut's motion with precision.

To tackle this problem, Xin Liu, the arts curator at the MIT Media Lab Space Exploration Initiative, developed a handheld device called Orbit Weaver, which allows a person experiencing microgravity to pull themselves toward a desired area.

Liu developed the handheld device by studying how spiders move, and then adapted these principles to humans in microgravity environment. In particular Liu cited "ballooning," a behavior in which spiders produce gossamer threads to fly through the air, as a particular point of inspiration. Similar to a spider, the Orbit Weaver deploys a magnet attached to a string that can be used by wearers to attach themselves to a stable surface and pulls them in that direction.

Although the device hasn't been tested in space just yet, it has come close. In November, the device was successfully demoed by Liu on a parabolic flight in Florida. (On parabolic flights, a modified jetliner is flown to around 32,000 feet and then goes into freefall for 30 seconds. During those 30 seconds, the passengers inside the plane experience the same sense of weightlessness felt by astronauts onboard the ISS.)

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"Why do we go to space? We have a dream, and the technological challenges are what we overcome to achieve that dream," Liu said of her flight. "I want to be able to move freely in 3D space, so I design the technologies that allow me to do that."
