

New exosuit helps runners sprint faster

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The exosuit is made of textile garments at the waist and thighs, and an actuation system with high control bandwidth performance to the back side. It showed the first reduction of the sprint time in the real world to the non-elite runners.

Credit: Assistive and Rehabilitation Robotics Lab at Chung-Ang University

A team of mechanical engineers at Chung-Ang University in South Korea has developed an exosuit that can help runners cover short

distances faster. Their project is reported in the journal *Science Robotics*.

An [exosuit](#) is a type of device that can be worn over the body. Engineers and roboticists have been creating exosuits over the past several years for multiple applications. Some types have been developed, for example, to help those with disabilities to walk. Others assist troops in carrying heavier loads. Others help people jog a little faster or to run longer distances. In this new effort, the research team built an exosuit expressly designed to improve running speed.

The exosuit built by the team in Korea is small with minimal parts. It consists of a [backpack](#) containing a power pack, which provides pressure on cables that extend from the pack to the hips and down each thigh. It weighs just 4.4 kilograms. The cables improve running speed by assisting with each stride—as a step is taken, the attached cable constricts, pulling the trailing leg forward faster than it would normally. The researchers also incorporated [sensors](#) and a computer to process information regarding gait—this allows for automatically synchronizing with steps as the person runs.

The team tested their exosuit by asking amateur volunteer runners to strap it on and go for two 200-meter runs. Each volunteer also ran the same distance twice without the device. All the runners were precisely timed. The researchers found that wearing the suit shaved off 0.97 seconds on average for one sprint. Since publication of their paper, the team has refined their exosuit and reports that it now weighs just 2.5 kilograms. They plan to test it with professional sprinters.

More information: Junyoung Moon et al, Reducing sprint time with exosuit assistance in the real world, *Science Robotics* (2023). [DOI: 10.1126/scirobotics.adf5611](https://doi.org/10.1126/scirobotics.adf5611)

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