

Exoskeleton for rehabilitation of specific body parts

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Credit: Investigación y Desarrollo

Exoskeletons are mechanical structures applied externally to the body; their function is to improve movement, support people suffering from injury or to increase physical strength to lift heavy objects.

To improve and extend the functionality of these devices, graduates of Technology Monterrey (ITESM) developed an [exoskeleton](#) that works with [artificial intelligence](#) and is made up of several independent parts to rehabilitate specific body parts like joints through [augmented reality](#).

Dr. Ernesto Rodríguez Leal, professor at the ITESM, explained that the device can activate via a headband containing electrodes, which receive and calculate the electroencephalographic signals emitted by the brain and electromyographic signals produced by muscles. These electrical impulses go to a microprocessor sorts and translates the signals using artificial intelligence algorithms.

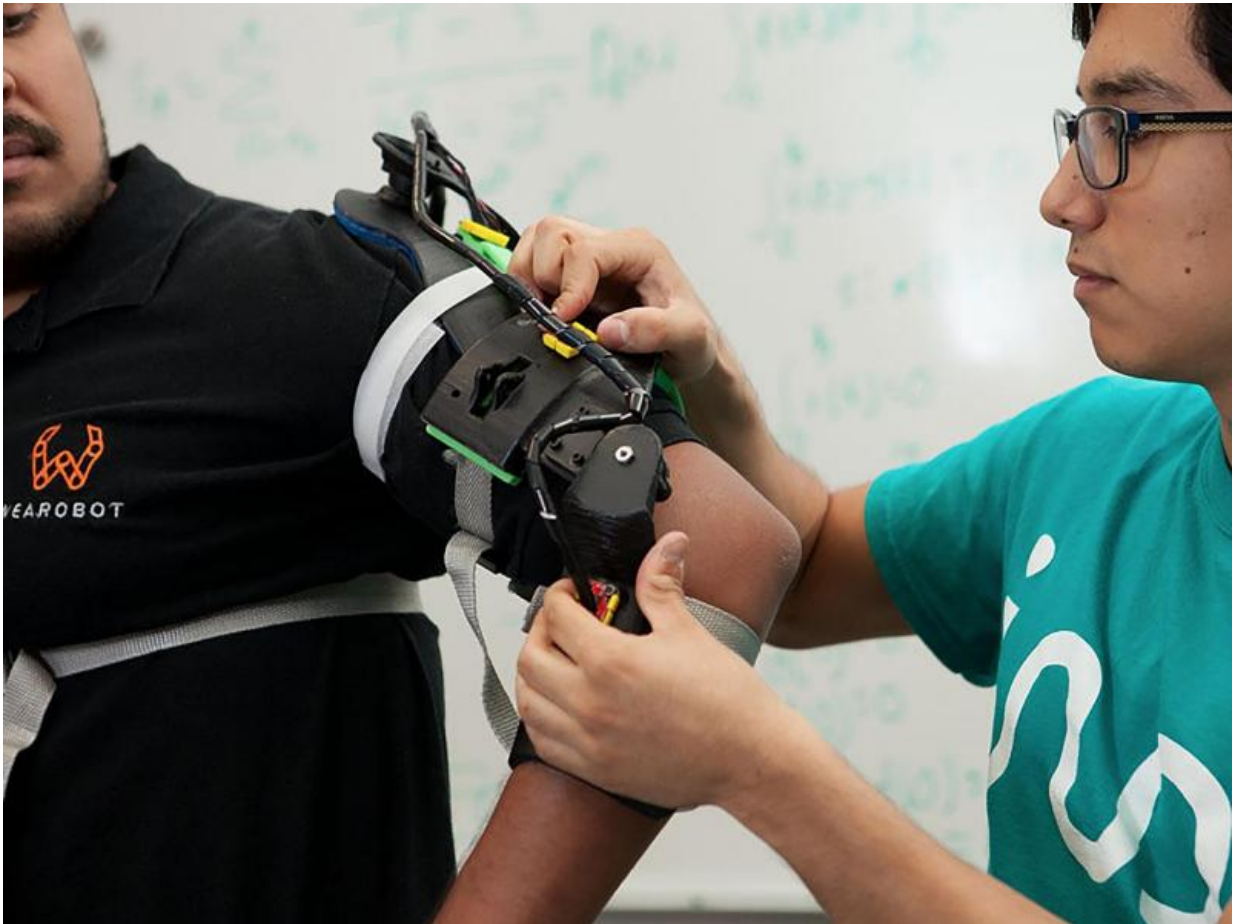
The specialist said that in addition to serving as a body support for people with injury or paralysis and assisting movement, the exoskeleton contains an augmented reality viewer showing three-dimensional spaces to be traversed by the patient for rehabilitation.

The exoskeleton consists of rigid aluminum and carbon fiber links with gears and DC motors whose function is to convert electrical energy into mechanical energy and apply it to the joints according to the patient's need. In turn, the device has sensors called accelerometers that determine the position of each link to coordinate the control algorithms of each motor.

The royal technologist stressed that the robotic suit is designed to help an elderly person with mobility problems to stand, move, sit and balance. It should be noted that candidates using the exoskeleton are trained so that the computer can identify and classify their [brain signals](#).



Ernesto Rodríguez Leal. Credit: Investigación y Desarrollo



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