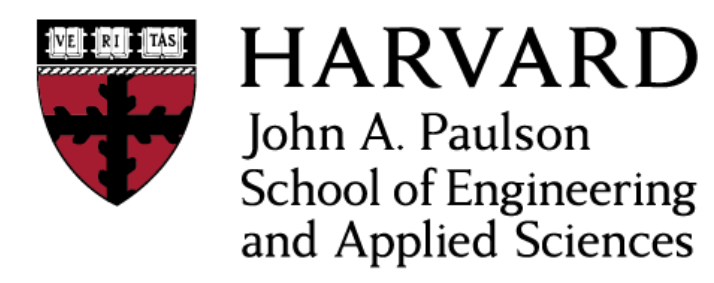


Human-Machine Interaction with Mobility Enhancing Soft Exosuits

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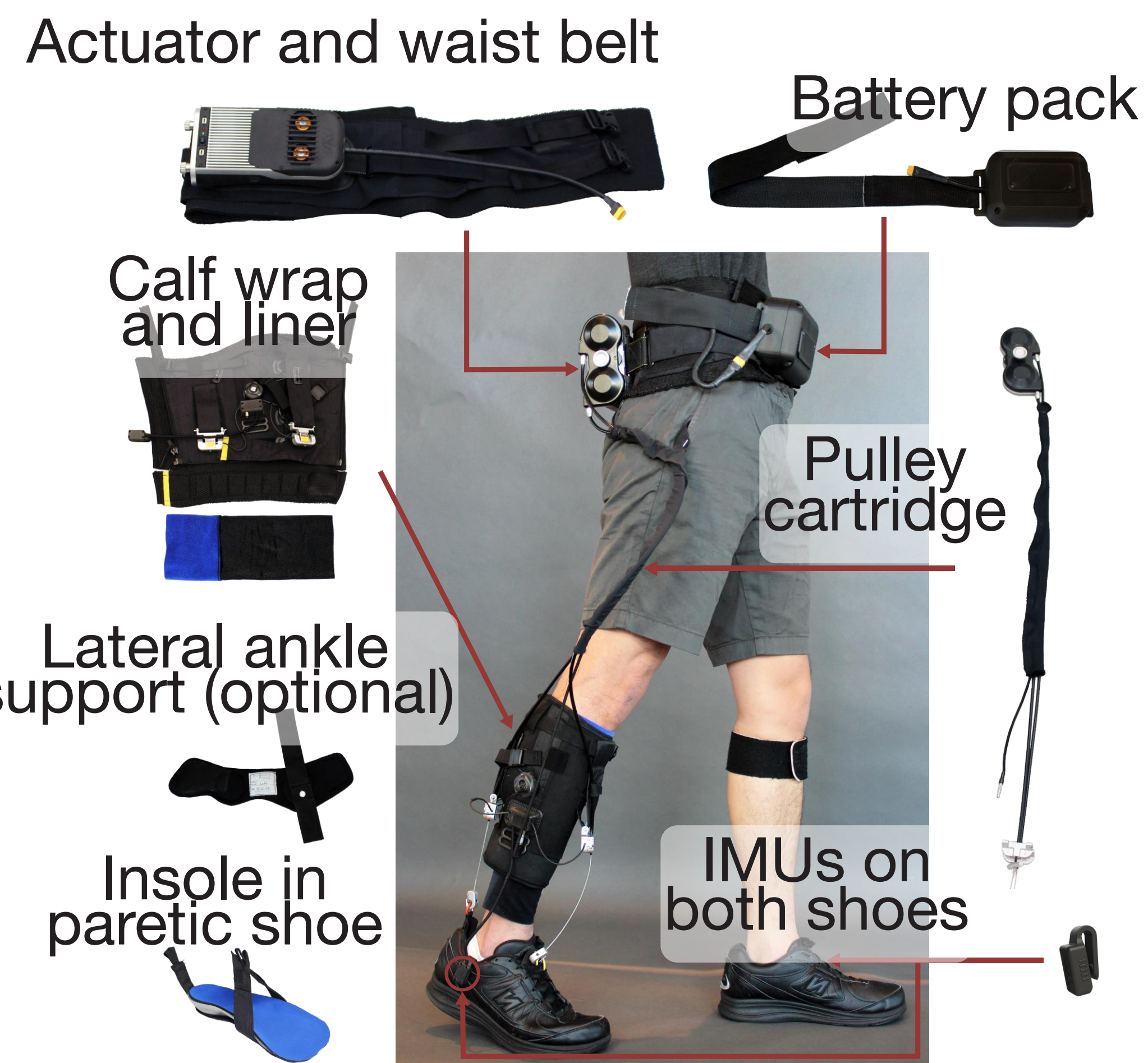
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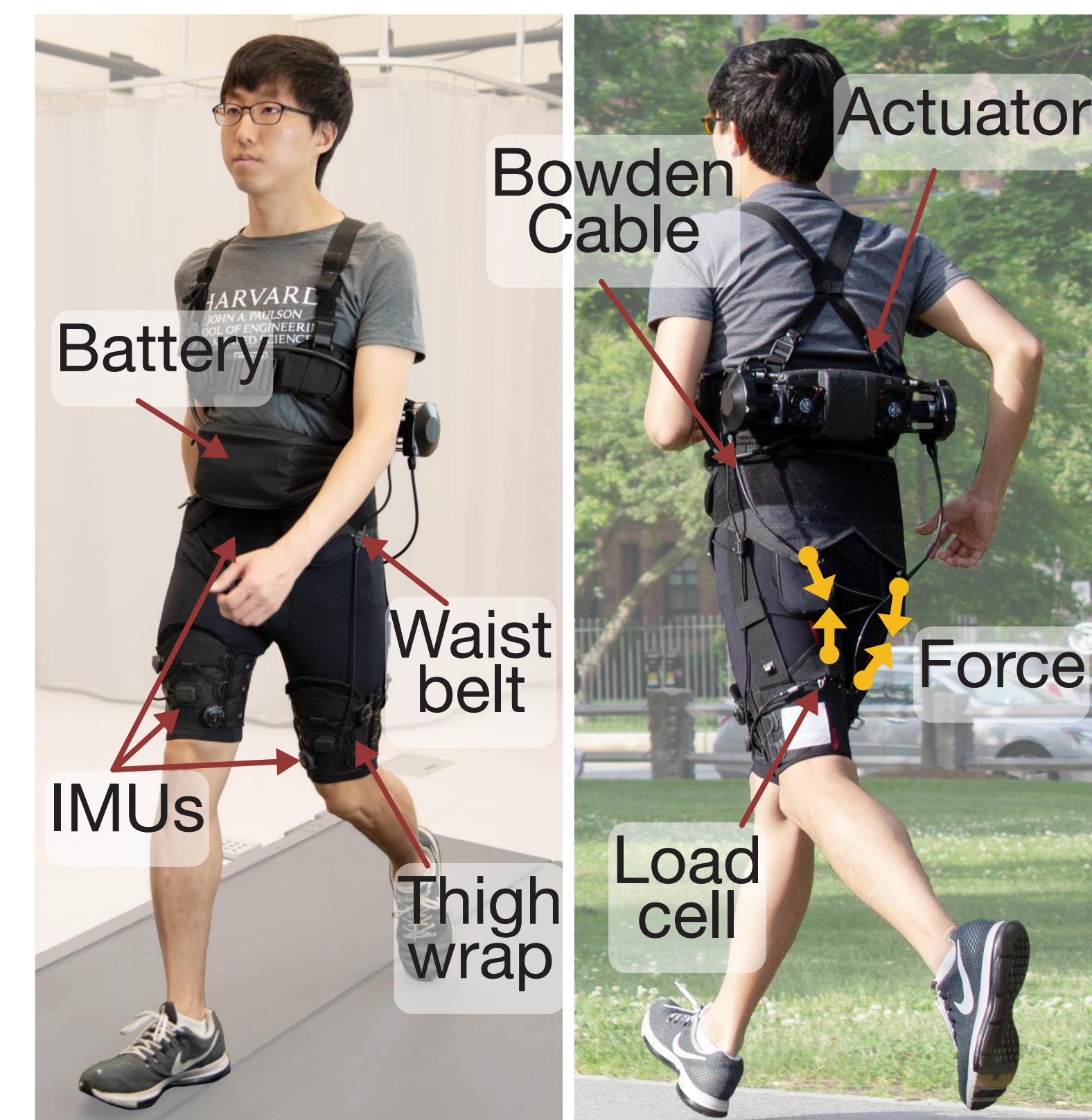
⁵ Boston University Department of Physical Therapy & Athletic Training, Boston, MA

1. Progress overview

Rehabilitation poststroke



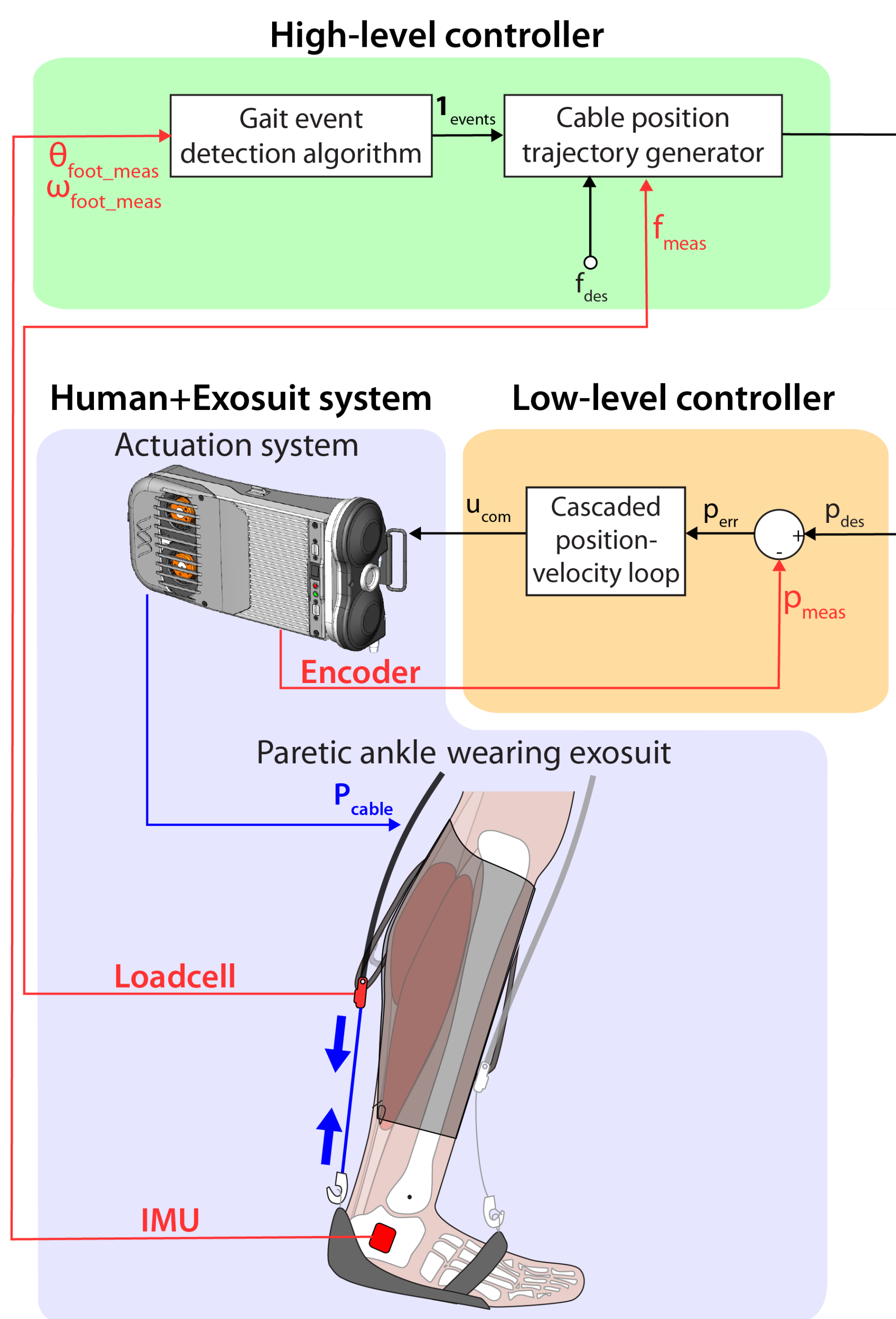
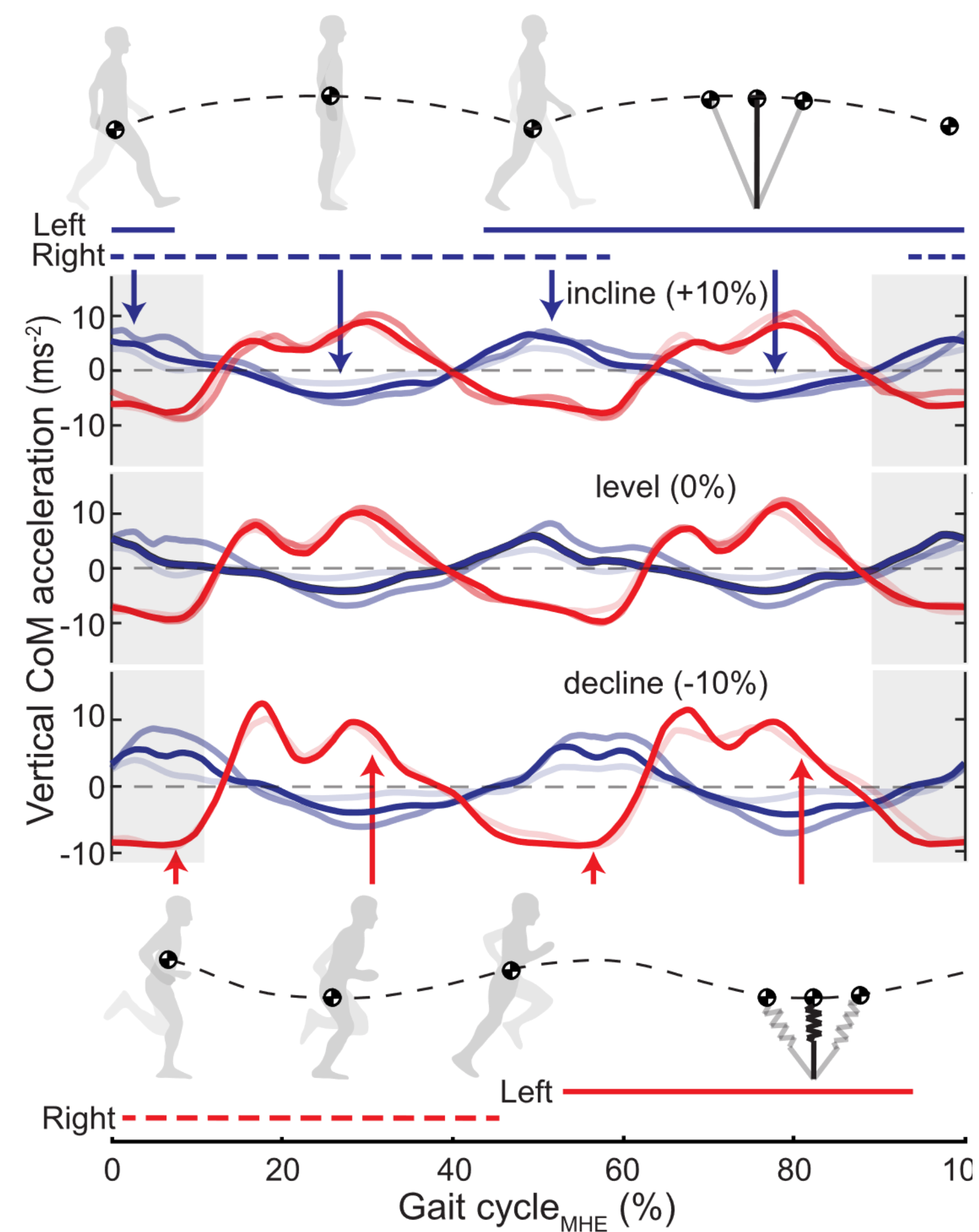
Exosuits for non-impaired populations



Our group's **soft exosuits** can improve gait quality in people poststroke [1-4] and enhance the mobility of healthy individuals during multiple activities [5-8]

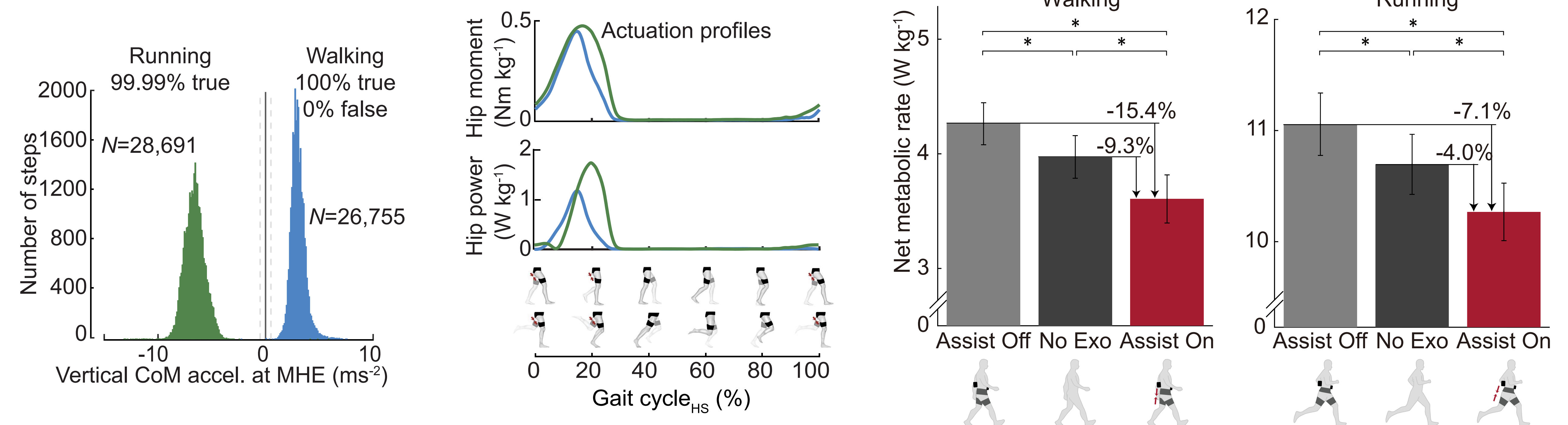
2. Soft exosuit cyber-physical system

- Inertial measurement units placed on the foot and torso to detect walking and running
- Body-worn actuators connected to Bowden cables apply torques in parallel to biological muscles



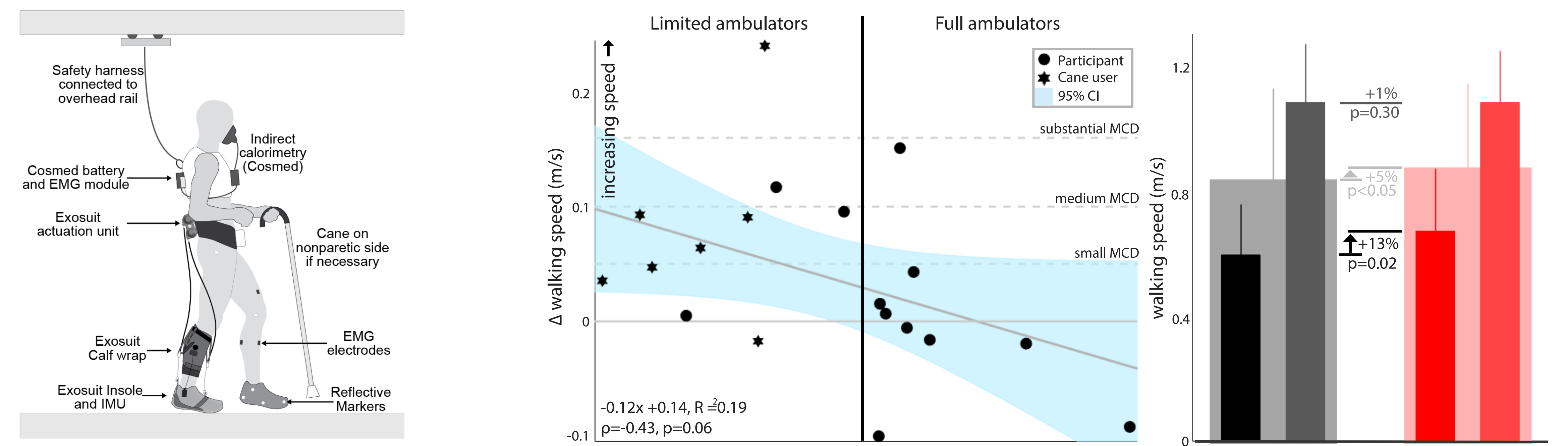
3. Comprehensive biomechanical analysis

Reducing the metabolic cost of walking and running



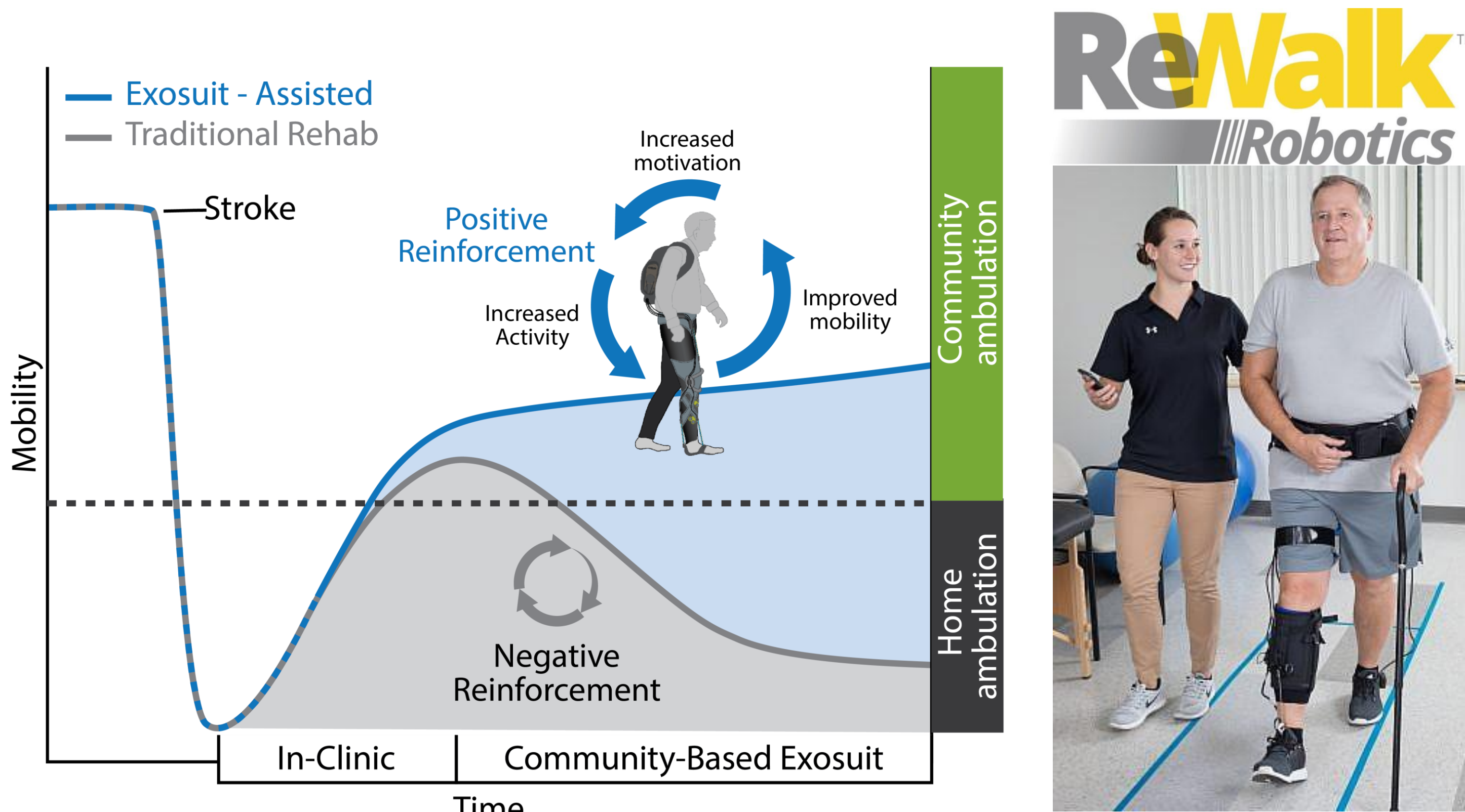
Increasing walking speed in limited community ambulators after stroke

Lab-based experiments (N=19) show that soft exosuits improve self-selected overground walking speed for limited community ambulators (comfortable walking speed below 0.96 m s⁻¹) by 13% while maintaining or increasing volitional effort



5. Transition to practice

Through a collaboration with ReWalk Robotics, a commercial version of the soft exosuit received CE mark in May, 2019 and FDA clearance in June 2019.



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