Synergy: Learning and Adaption in Pediatric Robotics

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Description

The goal in this proposal is to develop a set of technologies that lead to a pediatric exoskeleton that naturally promotes the walking skills among children affected by neurological conditions (e.g., Cerebral Palsy, Spinal Muscular Atrophy, Spina Bifida) in a short period of time.

1) Modularity in hardware

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2) Control Software that promotes the recovery of the wearer's gait

3) Stabilizing technology to ensure safety.

The experimental pediatric exoskeleton at its minimum size

Findings

1. A passive knee torque generator that provides ground clearance through morphing its geometry between the stance phase and the swing phase.

2. High speed of locomotion is needed for pediatric use. We are currently in the process of assessing the control efficiency. Experimental setups are conducted to verify some of the theories of the high bandwidth locomotion.

3. An stabilizer has been developed to provide locomotion in a medical exoskeleton with a reduced chance of falling.