Columbia Technology Ventures

A robotic pediatric walker to assist children learning how to walk

Technology #cu14308

Currently available pediatric walkers provide roller support to children as they learn how to walk. Depending on the design of the walker, children can hold on to the handle of the walker or wear a harness for support. While some of these walkers provide partial body weight support, none of these walkers can actively support the pelvis to assist with the development of proper balance and gait. For children suffering from developmental disorders or struggling to learn how to walk with traditional walker, more pelvic support and real time feedback is necessary. This technology is a robotic cyberphysical system for providing children with active robotic assistance and pelvic support as they learn how to walk. While using this technology, the child will be held in place by a harness, which functions as the human-robot interface.

Cable actuated system actively assists in balance and gait training

Unlike traditional walkers, this system will be open in the front to allow the user to interact with the environment and peers. Furthermore, this compact, lightweight device is ground and treadmill compatible for clinical and at home use. Tension sensors in the harness provide the system with position and movement data of the user. The data is then processed in real time and provides the appropriate force and torque on the user to guide movement. The system can be customized to adapt to different individuals based on training requirements, such as a child’s physical status and performance. This technology thus has the potential to be an invaluable tool to assist children in learning how to walk and correct gait imbalances, particularly in children with developmental disabilities.

A prototype of the cable-actuated system has been built for human testing.

Lead Inventor:

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Applications:

- Teaching children how to walk
- Pediatric rehabilitation
- Assisting developmentally-delayed children learn how to walk
- Detection and correction of pediatric gait imbalances
Advantages:

• Can exert three-dimensional force/torque on the pelvis with six degrees of freedom
• Specifically designed for pediatric use (target age is 1-5 years old)
• Compact size for home use
• Ground and treadmill compatible

Patent Information:

Patent Pending

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