Technology Commercialization Opportunity

Gait and Terrain Tracking - A Method for Simultaneously Tracking Both

Inventors
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Background and Technology Description
Gait training is a significant part of the rehabilitation process for individuals who have had strokes, lower-limb joint replacements, people who have foot drop, and people with other injuries or neurological disorders that result in abnormal gait. While physical therapy in a clinic or home-based setting is critical for restoring more natural gait patterns, these sessions are often limited to a handful of hours each week. In between visits, patients are responsible for remembering to continue their exercise regimens independently.

According to the Centers for Disease Control, over one million people in the US underwent either total knee or total hip arthroplasty during 2009. These individuals are required to undergo intensive gait training as part of their rehabilitation. Recent rehabilitation literature indicates that gait speed is a reliable indicator of patient progress. It has been linked to reduced likelihood of re-hospitalization, lower risk of falls, and higher likelihood of walking outside the house and being discharged to home or living independently in an assisted living facility. For the rehabilitation community, a device that patients could take home and wear while walking around during regular daily activity could serve the role of that daily walking speed and exercise intensity reinforcement.

A novel system to simultaneously track terrain and gait has been designed and a basic working prototype has been constructed and tested. We have demonstrated the ability to successfully identify a variety of different terrain types, completed quickly enough to be computationally feasible on a walking subject, and have been able to quantify gait patterns characteristic of a user. Our system can be used to monitor changes in gait patterns over time, gait speed, and level of exercise intensity.

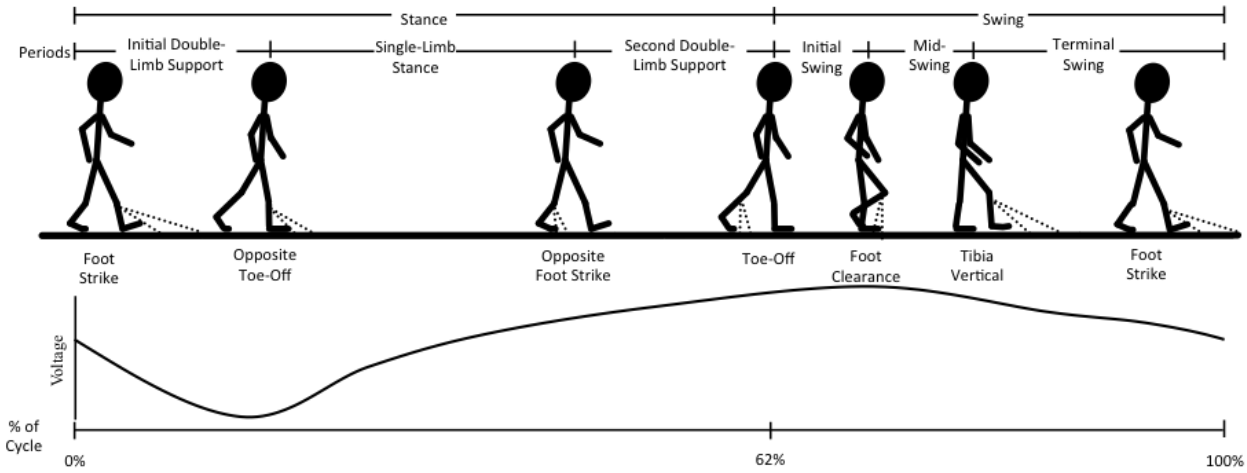
Keywords: Gait Monitor, Ambulatory Rehabilitation, Assistive Device, Orthopedics, Hip, Knee, Ankle

Technology Readiness
The wearable, portable terrain and gait monitor is currently at the prototype stage

Idea	**Concept**	Prototype	Alpha Version	Beta Version	Released

RIT developers will work with licensees to move the design to a commercial product.

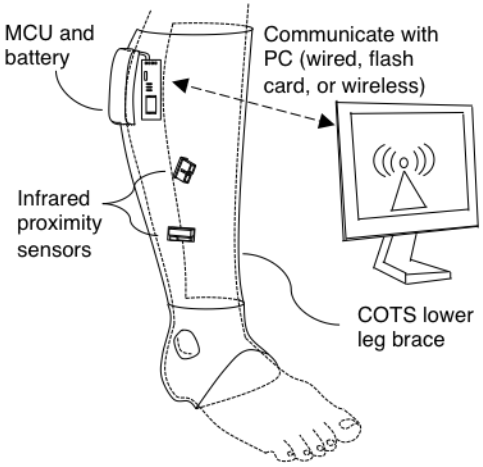
Intellectual Property
This technology is US patent pending, 20140180173.



The sensors work by looking out ahead of the user and measuring the distance to the upcoming terrain. A representative sensor profile is shown here, corresponding to a pattern of level walking.

Our prototype successfully predicts terrain within the first 60% of the gait cycle at the following rates:

Terrain Type	# steps evaluated	% correctly identified
Level Ground	98	94%
Up Ramp	70	83%
Down Ramp	80	97%
Up Stairs	50	80%
Down Stairs	50	90%



The system is comprised primarily of commercial, off-the-shelf parts and can be easily attached to the leg.

Target Customers

- Clinicians working in gait-related rehabilitation
- Knee, ankle, and leg brace manufacturers
- Ankle-foot or knee-ankle-foot orthotics manufacturers
- Prosthetic foot, lower leg, or lower limb manufacturers

Opportunity

RIT's Intellectual Property Management Office (IPMO) is interested in working with qualified parties who are interested in the commercialization of this novel rehabilitation system. Arrangement types include licensing the technology to existing organizations or to new organizations.

Contact

Those interested in learning more about this opportunity should contact:
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