



Reed

Researchers Receive NIH Grant to Develop a Wearable Shoe to Assist in Gait Rehabilitation

Tampa, Fla. (October 14, 2010) – Mechanical Engineering Assistant Professor Kyle Reed has received a \$102,000 grant from The National Institutes of Health for his project, “Gait Enhancing Mobile Shoe for Rehabilitation.”

The objective of this project is to develop a wearable device capable of long-term correction for individuals with asymmetric walking patterns. Individuals with central nervous system damage, such as stroke, often have irregular walking patterns and have a difficult time walking correctly.

Past research by co-PI Amy Bastian at the Kennedy Krieger Institute has shown that using a split-belt treadmill, which has two belts moving each leg at a different speed, can create after-effects that temporarily correct the inefficient walking patterns. Unfortunately, the corrected walking pattern does not efficiently transfer from the treadmill to walking over ground. The proposed shoe, unlike many current rehabilitation devices, will allow a patient to practice walking in many different locations, such as their own home, which is hypothesized to result in a more permanent skill transfer.

To enable long-term use, there are no motors and the horizontal motion is controlled solely through the use of brakes. The shoe uses the wearer’s natural forces exerted while walking to generate the necessary motions.

This device would provide an affordable rehabilitation method that could potentially be used in one’s home. As a research device, this shoe would provide a platform for studying over-ground walking, such as the transference of walking patterns from a treadmill to walking over ground, the effects of altering ground interaction forces in real-time, or perturbing the natural walking pattern at specific times during the step cycle. As a non-rehabilitation application, the device could be used to convert a wearer’s downward force into a forward motion to allow individuals to walk faster.

The University of South Florida is one of the nation's top 63 public research universities and one of only 25 public research universities nationwide with very high research activity that is designated as community engaged by the Carnegie Foundation for the Advancement of Teaching. USF was awarded \$394.1 million in research contracts and grants in FY 2009/2010. The university offers 232 degree programs at the undergraduate, graduate, specialist and doctoral levels, including the doctor of medicine. The USF System has a \$1.8 billion annual budget, an annual economic impact of \$3.2 billion, and serves more than 47,000 students on institutions/campuses in Tampa, St. Petersburg, Sarasota-Manatee and Lakeland. USF is a member of the Big East Athletic Conference.

Janet Gillis
Communications & Marketing Officer
USF College of Engineering
813-974-3485
janetgillis@usf.edu