

Christina-Anne Lahiff Wins the Present-A-Bull Award

On March 4, 2016, students from mechanical engineering at USF participated in Present-a-Bull event where students showcase ideas and research. This is an exciting opportunity for students to display their intellectual prowess, as well as practice their thesis, and advocate their research. The best presentation at the 2015 Present-a-Bull event received a cash prize and this year's winner was **Christina-Anne Lahiff** for her presentation on **Knee Orthosis with Variable Stiffness and Damping**.



Individuals with stroke have neuromuscular weakness or paralysis on one side of the body caused by some muscles disengaging while overexciting other muscles. Hyperextension of the knee joint and complete lack of plantar flexion of the ankle joint are common symptoms of stroke. The presentation focused on the creation and implementation of a small, lightweight, and adjustable orthotic device to be positioned around the knee of an able-bodied person to simulate stroke like gait. Force and range of motion data from able-bodied subjects fitted with the orthosis, inducing stroke-like gait, was collected using the Computer Assisted Rehabilitation ENvironment (CAREN) system. The four parameters that were investigated consisted of damping, catch, hysteresis, and stiffness effects.

The main goal of the project was to discern whether a device of relatively the same design could be utilized as a viable research instrument to simulate stroke-like gait. It is believed that the device has the potential to be utilized in the future as a rehabilitation device for people who have had a stroke since it is designed to induce larger knee flexion as an after effect. A comparison between how the dominant leg was affected by the orthosis versus how the non-dominant leg was affected was investigated as well. The results show that the device affected the velocities, knee angles, and force profiles of the gait of the subjects.



Christina-Anne Lahiff is currently a first semester graduate student at the University of South Florida starting her Masters in Mechanical Engineering as a part of the M.S.M.E. Accelerated Program. She started this degree program in Fall 2015. She graduated cum laude with her Bachelors of

Science in Mechanical Engineering in addition to graduating from the Honors College in December 2015. She is an active member of the American Society of Mechanical Engineers, Society of Hispanic Professional Engineers, Society of Women Engineers, and is the Vice President for the Tau Beta Pi Florida Gamma Chapter. Prior to becoming the organization's vice president, she held the roles of Engineering Expo Chair and

Service Chair. She is the recipient of the Francesca Luciana Martino Memorial Scholarship, Florida Bright Futures Academic Scholarship, USF Honors Scholarship, and the USF Director's Scholarship. She is currently a research assistant working on projects such as understanding how asymmetric impairments impact the resulting motions at Rehabilitation Engineering and Electromechanical Design Lab (REEDLab).