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Engineering & Scientific Consulting

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Professional Profile

Dr. Routson specializes in mechanical engineering with wide-ranging experience including root cause failure analysis within manufacturing, optimization, statistical analysis, and both simulation based and experimental biomechanics. Her breadth of experience enables her to engage in multidisciplinary problems that necessitate understanding of both human and technical aspects.

Prior to joining Exponent, Dr. Routson's work at Intel included yield analysis and failure investigations with root cause analysis. Her role combined in depth process knowledge with data analytics to inform program decisions that improved product quality and yield.

Prior to working in industry, Dr. Routson was a postdoctoral fellow at the University of Washington and the Department of Veterans Affairs Rehabilitation Research and Development Center of Excellence for Limb Loss Prevention and Prosthetic Engineering, where she worked with multidisciplinary teams on the design, construction, and assessment of novel prosthetic and assistive devices.

Dr. Routson also worked as an Associate Teaching Professor of Mechanical Engineering and the Assistant Director of the Advanced Manufacturing program at Colorado School of Mines, where she taught manufacturing processes, process control, and lean manufacturing. She was previously an Assistant Professor of Practice at Portland State University in Mechanical Engineering where she taught project management, design, and problem solving in industry within the capstone design sequence.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of Texas, Austin, 2014

M.S., Mechanical Engineering, The Ohio State University, 2010

B.S., Mechanical Engineering, The Ohio State University, 2008

National Science Foundation Graduate Research Fellow

National Science Foundation Pan American Studies Institute (PASI) Scholarship

Publications

Rebecca L. Routson, David J. Clark, Mark G. Bowden, Steven A. Kautz, Richard R. Neptune. "The influence of locomotor rehabilitation on module quality and post-stroke hemiparetic walking performance." Gait & Posture 2013; 38(3):511-517.

Rebecca L. Routson, Steven A. Kautz, Richard R. Neptune. "Modular organization across changing task demands in healthy and post-stroke gait." Physiological Reports 2014; 2(6):1-14.

Rebecca L. Routson, Marcus Bailey, Isabelle Pumford, Joseph M. Czerniecki and Patrick M. Aubin. "A smart cane with vibrotactile biofeedback improves cane loading for people with knee osteoarthritis." 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, FL, 2016; 3370-3373.

Evan Schuster, Rebecca L. Routson, Mason Hinchcliff, Karley Benoff, Pradeep Suri, Chris Richburg, Brittney C. Muir, Joseph M. Czerniecki, and Patrick M. Aubin "A Novel Walking Cane with Haptic Biofeedback Reduces Knee Adduction Moment in the Osteoarthritic Knee." J Biomech. 2020 November 28; 114:110150.

Conference Proceedings and Presentations

Rebecca L. Routson, David J. Clark, Mark G. Bowden, Steven A. Kautz, Richard R. Neptune. “Comparison of Module Quality and Walking Performance of Hemiparetic Subjects Pre- and Post-Locomotor Rehabilitation Therapy." Presented at the American Society of Biomechanics Conference, Gainesville, FL, August 2012.

Rebecca L. Routson, Steven A. Kautz, Richard R. Neptune. "Modular organization across changing task demands in healthy and post-stroke gait." World Congress of Biomechanics, Boston, MA, July 2014.

Steven A. Kautz, Rebecca L. Routson, Richard R. Neptune. "Predicting biomechanical deficits from impaired module coordination after stroke." World Congress of Biomechanics, Boston, MA, July 2014.

Andrea M. Wilson, Rebecca L. Routson, Katherine M. Steele, Joseph M. Czerniecki, David C. Morgenroth, Patrick M. Aubin. "Towards a biarticular prosthesis: Simulations of walking with a prosthetic gastrocnemius." Northwest Biomechanics Symposium, Seattle, WA, May 2015.