Electromyographic assessment of an upper body exoskeleton at John Deere and Toyota

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Abstract
Upper body exoskeletons have the potential to be a practical intervention for shoulder injury reduction, but testing is needed to document benefits and drawbacks of these assistive devices. In this talk, Dr. Gillette will describe electromyography (EMG) based ergonomic assessments for a passive upper body exoskeleton used by workers at manufacturing facilities and construction sites. Data analysis steps will be outlined for comparing EMG amplitudes to threshold limit values (TLVs) as a predictor of upper body fatigue and potential injury risk. Results from on-site data collections at John Deere and Toyota will be presented. Dr. Gillette will discuss how the experimental data have been interpreted and how the results may be used to make decisions about exoskeleton usage.

About the Speaker
Dr. Jason Gillette is an Associate Professor and the Director of Graduate Education in the Department of Kinesiology at Iowa State University. His research interests include biomechanics, ergonomics, and injury mechanisms, where he utilizes video, force, and electromyography (EMG) measurements to analyze human motion. He studies athletic movements, industrial job tasks, and activities of daily living. One of his current projects involves assessing the Levitate Airframe exoskeleton in manufacturing and construction settings using EMG to quantify muscle activation and fatigue.