

## Advancing Human Safety and Ergonomics through Sensing and Simulation

Andrew S. Merryweather<sup>1,2</sup>, Mitja Trkov<sup>1,2</sup>, and Jonathan Mortensen<sup>1</sup>

<sup>1</sup>Department of Mechanical Engineering, University of Utah

<sup>2</sup>Rocky Mountain Center for Occupational and Environmental Health, University of Utah

Corresponding author's Email: [a.merryweather@utah.edu](mailto:a.merryweather@utah.edu)

**Author Note:** Andrew Merryweather is an Associate Professor in Mechanical Engineering at the University of Utah and Director of the Ergonomics and Safety Program at the NIOSH-supported Rocky Mountain Center for Occupational and Environmental Health (RMCOEH).

Parts of this work were supported by research funding from the Centers for Disease Control (CDC) / NIOSH (Grant #T42OH008414-10). The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the CDC/NIOSH. The authors would like to acknowledge the efforts of his colleagues and students for making this project possible.

**Abstract:** The way we work and interact with our world is evolving with rapidly expanding technologies. Ergonomics and human factors must be innovative in order to meet these new challenges. Ergonomics and Safety are scientific disciplines used to engineer better solutions to address the complex relationship between people and their environments. Goals include the reduction of musculoskeletal disorders, worker errors, and physical strain and exhaustion through the study of engineering, biomechanics, human factors, anthropometry, industrial design, and user-interface design. We can use wearable sensors, robotics and computational musculoskeletal models to enable greater knowledge of exposure, injury risk and prevention. This presentation will highlight examples of how research from the Ergonomics and Safety Lab at the University of Utah is using a variety of techniques and methods to develop technologies to safely and efficiently interact with our ever changing world.

*Keywords:* Wearable Technology, Instrument Insoles, Musculoskeletal Disorders, Exposure Monitoring