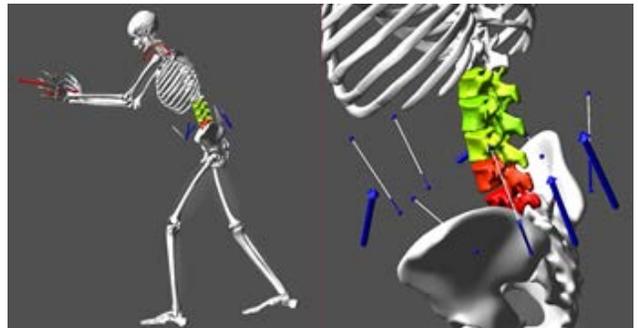


OSU DEPARTMENT OF INTEGRATED SYSTEMS ENGINEERING

BIOMECHANICS, PHYSICAL ERGONOMICS, & SAFETY

The Department of Integrated Systems Engineering offers undergraduate and graduate students coursework and research opportunities in biomechanics, physical ergonomics, and occupational safety. Faculty, research staff, and students affiliated with the Spine Research Institute, Biodynamics Laboratory, Center for Occupational Health in Automotive Manufacturing, Orthopaedic Ergonomics Laboratory, and the Engineering Laboratory for Human Factors/Ergonomics/Safety conduct research focused on the intersection of people, technology, and work, with the objective of improving the design and performance of work systems that preserve and promote worker health and allow people to work more effectively.

Focus. We provide an integrative systems perspective linking technology, epidemiology, statistical methods, and industrial engineering work analysis techniques, with knowledge about humans from anthropometry, physiology, biomechanics, psychology, anatomy, kinesiology, rehabilitation sciences, and medicine to:



- improve the understanding of causal pathways of musculoskeletal disorders and recovery
- quantify the human body's biomechanical response to risk factors imposed by occupational tasks
- assess effectiveness of interventions to reduce injury risk posed by hazardous work tasks and environments
- develop models that provide insight into the development of spine, neck, and other musculoskeletal disorders and strategies for prevention and recovery

Approach. To accomplish this, we take a highly interdisciplinary and collaborative approach, engaging with research partners from medicine, design, psychology, other engineering disciplines, and health and rehabilitation sciences. We also work collaboratively with subject matter experts (workers) to understand the ways in which they are challenged by work processes and environments and work with them to ideate and evaluate potential solutions to reduce those challenges and facilitate their work performance.



Application areas. These are as diverse as the work that humans can undertake, including health care, clinical treatment, fire and EMS services, automotive manufacturing, office work, education, grocery and retail checkout, aircraft maintenance, distribution warehousing, & more.

Concentration Faculty: William Marras (ISE, Orthopaedics, Neurosurgery, PM&R), Steven Lavender (ISE, Orthopaedics), Carolyn Sommerich (ISE, SHRS)

Affiliated Faculty: Thomas Best, MD (SHRS, Orthopaedics, Biomedical Informatics), Safdar Khan, MD (Orthopaedics, ISE), Elizabeth Yu, MD (Orthopaedics), Richard Jagasinski (Psych)