

Page Morton Hunter Distinguished Seminar Series



Clemson
Greenville
Charleston

“Real-World Performance Analytics: Integrating AI and Biomechanics in Authentic Athletic Environments”

Dr. Melissa Boswell, Ph.D.

Melissa Boswell is a dedicated leader at the forefront of bioengineering, driving innovation as the VP of Science and Research at the Joe Gibbs Human Performance Institute. Melissa heads JGHPI’s human performance research vision by bridging multidisciplinary groups and leading collaborative research projects between JGHPI and other research institutes.

Bridging bioengineering, computer science, and psychology advancements, Melissa drives scientifically backed health technology forward with a positive impact on health and society. As an expert in human movement biomechanics, she has pioneered innovative methods for quantifying movement as a biomarker. She is also passionate about motivating physical activity and increasing access to health care.

Before joining the Human Performance Institute, Melissa was a postdoctoral scholar in the Neuromuscular Biomechanics Laboratory at Stanford University, where she received her PhD in Bioengineering.



The integration of artificial intelligence with biomechanical analysis has opened new frontiers in athletic performance assessment. At the Joe Gibbs Human Performance Institute, we have developed a revolutionary approach to capturing and analyzing human movement in authentic sporting environments. Our state-of-the-art facility enables the simultaneous capture of force dynamics, markerless motion tracking, and physiological metrics while athletes engage in natural, sport-specific movements.

Through automated data collection and analysis pipelines, we seamlessly integrate these diverse data streams to model the relationship between movement patterns and performance outcomes. This approach represents a significant advancement over traditional laboratory-based assessments, providing unprecedented insights into the complexities of athletic performance in real-world conditions.

The talk will showcase how our automated systems leverage artificial intelligence to process and analyze large-scale movement data, enabling rapid feedback and performance insights. We will present case studies demonstrating how this technology has been applied across various sports, highlighting our success in identifying performance optimization opportunities and reducing injury risks. By combining cutting-edge AI technologies with comprehensive biomechanical analysis in authentic sporting environments, we are pioneering new approaches to understanding and enhancing human athletic performance.

DATE: February 13, 2025 at 3:30 p.m.

LOCATION: 111 Rhodes Annex, Clemson University
(Zoom link available for all locations.)



Department of
BIOENGINEERING
Clemson University