



## Sam Masters, Ph.D.

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### PROFESSIONAL PROFILE

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Dr. Masters has over 15 years of biomechanics research experience and over 5 years of forensic biomechanics experience. Dr. Masters is an expert in musculoskeletal modeling of human motion to evaluate human performance and injury risk, human subjects testing, product design, wearable technologies development and evaluation, physics-based machine learning/artificial intelligence approaches, and 3D motion capture. Dr. Masters leverages these state-of-the-art technologies to assist legal and industry partners in evaluating their products in real-world scenarios and applications. Dr. Masters has extensive experience developing bespoke and leveraging advanced computational models of the human body to evaluate real-world data and investigate user-product interactions. Dr. Masters utilizes these advanced techniques in several industries to evaluate hardware, validate wearable sensors, measure the biomechanics of human-product interactions to evaluate performance, comfort and/or fit, perform ergonomic assessments, validate artificial intelligence algorithms, curate training data for artificial intelligence models, and develop physics-based benchmarking tools for artificial intelligence models. Due to Dr. Masters' extensive background in developing, evaluating, and validating human-centered technologies, he provides highly valuable insights to companies during all stages of their product development cycle. Dr. Masters serves many different government, industry, and private sectors including those related to the military, wearables technologies, consumer products, automotive, software developers, virtual reality, medical devices, pharmaceutical, and artificial intelligence to name just a few. Before becoming a consultant, Dr. Masters was the Associate Director of the Golf Teaching and Research Center and Assistant Research Professor at Penn State where he conducted sports research, performed advanced biomechanical analysis of the golf swing, assisted in developing golf biomechanics curriculum, and evaluated golf biomechanics hardware and software within the PGA-affiliated Professional Golf Management program at Penn State.

### POSITIONS

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<b>Brillouin Consulting</b> <b>Senior Manager</b> Biomechanical, product development, wearable technologies, mechanical testing, 3D motion capture, computational modeling, virtual reality, and human subjects testing expert focused on real-world industry application and failure analysis investigations for corporate, private, and legal clients. Dr. Masters is also an expert in ergonomics as it relates to product design, sporting equipment evaluation, premise and workplace settings evaluations, among many others. Dr. Masters has extensive experience in investigating premise liability, automotive crashes, product failure analysis as well as bespoke mechanical testing to investigate claims.	<b>San Francisco, CA</b> June 2026 - Present
<b>Exponent, Inc.</b> <b>Managing Scientist</b> Biomechanics Practice	<b>Phoenix, AZ</b> May 2024 - May 2026
<b>Senior Associate</b> Biomechanics Practice	Mar 2023 - April 2024
<b>Associate</b> Biomechanics Practice	May 2021 - Feb 2023

**Pennsylvania State University**  
**Associate Director, Golf Teaching & Research Center**  
Professional Golf Management Program

**State College, PA**  
Aug 2018 - April 2021

**Assistant Research Professor, Kinesiology Department**  
The College of Health and Human Development

Aug 2018 - April 2021

## **ACADEMIC CREDENTIALS**

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**Pennsylvania State University**  
Ph.D., Kinesiology

**State College, PA**  
2020

**Pennsylvania State University**  
M.S., Kinesiology

**State College, PA**  
2014

**University of Tulsa**  
B.S., Exercise and Sports Science, Magna Cum Laude

**Tulsa, OK**  
2012

## **PROFESSIONAL AFFILIATIONS**

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- Biomedical Engineering Society
- American Society of Biomechanics
- International Society of Biomechanics in Sports

## **PUBLICATIONS**

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- Masters S, Challis J. The effects of wobbling mass components on joint dynamics during running. *Journal of Applied Biomechanics* 2022; 38(2).
- Masters S, Challis J. Increasing the stability of the spring loaded inverted pendulum model of running with a wobbling mass. *Journal of Biomechanics* 2021; 110527.
- Masters SE Challis J. Soft tissue vibration: A biologically-inspired mechanism for stabilizing bipedal locomotion. *Bioinspiration & Biomimetics* 2021; 16:026015.

## **PRESENTATIONS**

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- Masters S, Davis D, Handley E, Merrell D. Pelvis and torso kinematic differences between driver and iron swings. 11th World Scientific Congress of Golf, Loughborough, UK, 2024.
- Masters S, Challis J. Soft tissue increases stability and propulsion during human running. 41st Annual American Society of Biomechanics Conference, Boulder, CO, 2017.
- Masters S, Wager J, Challis J. A zero-feedback and stable running model controlled by a central pattern generator. 41st Annual American Society of Biomechanics Conference, Boulder, CO, 2017.
- Masters S, Challis J. The effects of adipose tissue vibration on the total body change in energy and signal time-frequency distribution. 40th Annual American Society of Biomechanics Conference, Raleigh, NC, 2016.
- Masters S, Challis J. The dynamics of a passive-dynamic walker with a wobbling mass. 40th Annual American Society of Biomechanics Conference, Columbus OH, 2015.
- Masters S, Challis J. Soft tissue components increase stability and affect the kinematics of a passive-dynamic walker. XXV Congress of the International Society of Biomechanics, Glasgow, UK, 2015.