



Madison George

Ph.D. Student in Bioengineering, admitted Autumn 2023

Bio

BIO

A life-long athlete, I am strongly influenced by my background as a D1 pole vaulter and hope to effect change in the way we diagnose injuries and enhance sport performance. I am co-advised between the Imaging of Musculoskeletal Function (IMF) Lab with Feliks Kogan and the Neuromuscular Biomechanics Lab (NMBL) with Scott Delp and am investigating non-invasive imaging biomarkers of exertional compartment syndrome. My hometown is Scottsdale, AZ and I graduated from Elon University ('23) with a BS in Engineering (conc. biomedical engineering) and a minor in exercise science. My undergraduate thesis was an interdisciplinary research and development project leading to the design of the first women's pole vaulting shoes.

HONORS AND AWARDS

- Stanford's Translational Biomedical Imaging and Instrumentation (TBI2) Training Grant, Stanford, NIBIB (09/23-Present)
- Barry Goldwater Scholarship, The Barry Goldwater Scholarship and Excellence in Education Foundation (March 2022)
- Lumen Prize, Elon University (April 2021)
- Honors Fellows Program, Elon University (April 2019 - May 2023)
- CAA Female Scholar-Athlete of the Year, The Coastal Athletic Association (April 2023)
- CAA Institutional Scholar-Athlete of the Year, Elon University (April 2023)
- CAA Leadership and Sport Excellence Award, The Coastal Athletic Association (June 2022, June 2023)
- A.L. Hook Scholar Athlete Award, Elon University (May 2022, May 2023)
- Engineering Research Award, Elon University (May 2023)
- Student Speaker at the Elon LEADS Celebration, Elon University (April 2023)
- Student Speaker at the Night of the Phoenix, Elon University (October 2022)
- Jerry and Jeanne Robertson Women's Track and Field Scholarship, Elon University (August 2021, August 2022)
- Phi Eta Sigma Honor Society, Phi Eta Sigma (November 2020)
- Pi Mu Epsilon Honor Society, North Carolina Nu Chapter (April 2022)
- Phi Kappa Phi Honor Society, Phi Kappa Phi (March 2022)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

With my research I bridge the most prominent aspects of my life: academics and athletics. In my undergraduate experience, I completed a co-mentored interdisciplinary thesis to design the first women's pole vaulting shoes. I performed studies of pole vaulter foot biomechanics, mechanical evaluations

of shoes, and shoe materials analyses. Now, I am committed to improving biomedical imaging for musculoskeletal injury diagnoses to enhance performance and properly diagnose injuries.

My current graduate research project is investigating non-invasive biomarkers of exertional compartment syndrome (ECS). ECS is a painful condition characterized by abnormally high muscle compartment pressures induced by exercise. Currently, the only diagnostic procedure for ECS is intra-compartmental pressure measurement which requires the insertion of a needle into the muscle to directly quantify pressure, which is a barrier to both patients and clinicians. Due to the invasiveness and lack of physicians trained for this measurement, it is often not performed, and symptoms are misdiagnosed as shin splints or muscle strains. We will develop and evaluate new MRI technologies to (1) increase understanding of the pathophysiology of this condition and (2) Improve clinical diagnosis of ECS.

Publications

PUBLICATIONS

- **No Space? No Problem. Accessible Balance Control Using VR Player Movement** *Systems and Information Engineering Design Symposium (SIEDS)*
George, M. K., Roveri, A. D., Weitz, A. S., Azan, A. N., Ogunmola, C. T., Plier, W. T., Wittstein, M. W.
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