

MCKENZIE S. WHITE

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EDUCATION

- PhD Movement Science** August 2023
University of Michigan, Ann Arbor, MI
- MS Biomedical Engineering** Feb 2018
University at Buffalo, The State University of New York
- BS Business Administration** May 2016
University at Buffalo, The State University of New York

RESEARCH EXPERIENCE

- Post-Doctoral Scholar** Stanford University 01/2025 - Current
- Post-Doctoral Scholar** University of Kentucky 09/2023 – 11/2024
- Developed custom application for musculoskeletal ultrasound image processing
 - Static B-mode imaging for quantifying muscle size and quality, and patella tendon length and thickness
 - Dynamic shear wave elastography for quantifying mechanical properties of muscle and tendon
 - Built collaborations with the Bioinformatics and Artificial Intelligence Cores to develop fully automated image analysis pipelines for processing B-mode Ultrasound
- Graduate Research Assistant in Kinesiology** University of Michigan 06/2019-08/2023
- Custom workflow development for the following data sources
 - Dynamic B-mode ultrasound imaging for quantifying muscle fascicle and tendon mechanics
 - Knee cartilage composition via T1rho/T2 magnetic resonance imaging
 - Multi-stack quadriceps muscle fat infiltration via Dixon magnetic resonance imaging
 - Static B-mode ultrasound assessments of femoral trochlear cartilage health
 - Software implementation for quadriceps muscle architecture (diffusion tensor imaging)
 - Automated workflow development that utilizes 3D marker-less motion capture (DeepLabCut)
 - Developed multiple project structures, management plans for 20+ undergraduate students with emphasis on strategic planning, productivity, and building a sustainable lab culture centered on the following core values: trust, integrity, teamwork, dedication, and celebration
- Graduate Research Assistant in Kinesiology** University of Connecticut 08/2018-06/2019
- Implemented 2D marker-less motion capture (DeepLabCut) into rodent lab and created a semi automatic program to assess lower extremity gait (python)
- Graduate Student in Biomedical Engineering** University at Buffalo 08/2016-01/2018
- Lower extremity gait analyses using Vicon Motion Capture Systems and Visual 3D C-Motion software

TEACHING EXPERIENCE

Graduate Student Instructor University of Michigan 06/2019-08/2023

- Graduate student instructor for Human Musculoskeletal Anatomy (MOVESCI 230)
- Supervised undergraduate students in the Undergraduate Research Opportunity Program
- Prepared course material including lectures, rubrics, assignments

Graduate Teaching Assistant University of Connecticut 08/2018-06/2019

- Graduate teaching assistant for Biomechanics of Injury and Sport (KINS 3522)

HONORS AND AWARDS

1. Rackham Graduate Student Research Grant (Summer 2021)
2. Zatkoff Family Graduate Fellowship (Summer 2021)
3. Invited seat at DeepLabCut Hackathon (Spring 2020)
4. University at Buffalo Athletics 'Unsung Hero' (Spring 2016)
5. Mid Atlantic Conference Women's Soccer Champions (Fall 2014)
6. University at Buffalo Spectrum Special Issue Nominee and Award (Fall 2013)
7. University at Buffalo Provost Scholarship (Fall 2011 – Spring 2016)
8. NCAA Division 1 Scholarship (Fall 2011 – Spring 2016)
9. Dean's List University at Buffalo (Fall 2011 – Spring 2016)

RELEVANT SKILLS

Programming Languages: python, R, MATLAB

Motion Capture: Vicon, Visual 3D, Qualisys, Motion Analysis, Optitrack, Markerless Motion Capture (DeepLabCut), Electromyography

Imaging:

- Magnetic Resonance Imaging: Dixon, Diffusion Tensor Imaging, T1rho/T2 Mapping
- Ultrasound: B-mode of Cartilage, Muscle, Tendon and Shear Wave Elastography of Muscle and Tendon
- Computed tomography: Human and animal models

Technical: MATLAB Application and GUI Development, Computer vision, Automatic and Semi-Automatic workflows, Signal processing (MATLAB, Neuralynx, python)

Professional: Project Management, Team Management, Organizational Management and Leadership, Strategic Planning, Mentorship

Other: Linux (Ubuntu), MacOS, Windows

PEER REVIEWED PUBLICATIONS

In-Press

1. Erickson LN, Owen MK, Casadonte KR, Janatova T, Lucas KS, Spencer K, Brightwell BD, Graham MC, **White MS**, Thomas NT, Latham CM, Jacobs CA, Conley CE, Thompson KL, Johnson DL, Hardy PA, Fry CS, Noehren B. The Efficacy of Blood Flow Restriction Training to Improve Quadriceps Muscle Function after Anterior Cruciate Ligament Reconstruction. *Medicine & Science in Sports & Exercise*, 2024.
2. Garcia SA, **White MS**, Gallegos J, Balza I, Kahan S, DeFrate LE, Palmieri-Smith RM. Associations between body composition, gait biomechanics and *in vivo* cartilage function after exercise in those with anterior cruciate ligament reconstruction. *American Journal of Sports Medicine*, 2024.
3. **White MS**, Graham MC, Janatova T, Hawk GS, Thompson KL, Noehren B. Influence of Sampling Rate and Signal Processing Decisions on Rate of Torque Development and Force Steadiness. *Sensors*, 2024.
4. **White MS**, Ogier AC, Chenevert TL, Zucker E, Stoneback L, Michel CP, Palmieri-Smith RM, Lepley LK. Beyond Weakness: Exploring Intramuscular Fat and Quadriceps Atrophy in ACLR Recovery. *Journal of Orthopedic Research*, 2024.
5. **White MS**, Mancini LM, Stoneback L, Palmieri-Smith RM, Lepley LK. Chronic Adaptions In Quadriceps Fascicle Mechanics Are Related to Altered Knee Biomechanics After ACL Reconstruction. *Journal of Applied Biomechanics*, 2024.
6. Garcia SA, **White MS**, Gallegos J, Balza I, Kahan S, Palmieri-Smith RM. Associations between body composition, walking mechanics and trochlear cartilage thickness in those with anterior cruciate ligament reconstruction. *Medicine & Science in Sports & Exercise*, 2024.
7. Stoneback L, Fullano GD, **White MS**, Naaz S, Lepley LK. Development of a low-cost epimysial electromyography electrode: a simplified workflow for fabrication and testing. *Journal of Visualized Experiments*, 2024.
8. **White MS**, Palmieri-Smith RM, Lepley LK. Open-sourced semi-automatic program for ultrasound assessments of femoral trochlea cartilage health. *Computer Methods in Biomechanics and Biomedical Engineering*, 2023.
9. Davi SM, Ahn H, **White MS**, Butterfield TA, Kosmac K, Kwon OS, Lepley LK. Long-lasting impairments in Quadriceps Mitochondrial Health and Muscle Size and Phenotypic Composition are Present After Non-Invasive Anterior Cruciate Ligament Injury. *Frontiers in Physiology*, 2022
10. **White MS**, Horton ZW, Burland JP, Seeley MK, Lepley LK. The Utility of Functional Data Analyses to Reveal Between-Limbs Asymmetries in Those With a History of Anterior Cruciate Ligament Reconstruction. *Journal of Athletic Training*, 2021.
11. **White MS**, Brancati RJ, Lepley LK. Joint Kinematics Dictate Subchondral Bone Remodeling in a Clinically Translational Model of ACL Injury. *Journal of Orthopaedic Research*, 2020.

12. Lepley LK, Davi SM, Hunt ER, Burland JP, **White MS**, McCormick GY, Butterfield TA. Skeletal muscles subjected to eccentrically or concentrically biased exercise exhibit similar morphology with disparate hypertrophic responses. *Journal of Athletic Training*, 2020.
13. Horton WZ, Page G, Reese S, Lepley LK, **White MS**. Template Priors In Bayesian Curve Registration. *Technometrics*, 2020.

In-Review

1. **White MS**, Garcia SA, Pang Y, Casey CM, Palmieri-Smith RM, Lepley LK. Patellofemoral Cartilage Changes Are Not Associated with Quadriceps Metrics after ACLR with Patellar Tendon Autografts. *Journal of Orthopedic Research*.
2. **White MS**, Horikawa-Strakovsky A, Arenas-Florez MN, Jones LW, Noehren B, Wen Y. Open-Sourced Automated Vastus Lateralis Size and Quality Analysis via B-mode Ultrasound.
3. Owen MK, Hardy PA, Damon, BM, **White MS**, Thomas NT, Fry CS, Noehren B. Relationships between Diffusion Tensor Parameters and Measures of Skeletal Muscle Fiber Size and Strength After Anterior Cruciate Ligament Injury. *Journal of Physiology*.

MEDIA INTERVIEWS

1. Dr. Lindsey Lepley and Dr. McKenzie White - Doctor Radio Sports Medicine with Dr. Dennis Cardone, Dr. Guillem Lomas, June 2024
2. The Long-Term Burden of Oversimplified Data and Diagnoses – A Patient-Researcher Perspective – ACL Study Day – South Coast Seminars, May 2021
<https://www.evidenceandpractice.com/blogs/the-long-term-burden-of-oversimplified-data-and-diagnoses>
3. Protecting Her Goal – University at Buffalo Athletics, November 2013
<https://www.ubspectrum.com/article/2013/11/protecting-her-goal#>

CONFERENCE PRESENTATIONS AND ABSTRACTS

1. **White MS**, Palmieri-Smith RM, Lepley LK. Quadriceps Atrophy Without Hamstrings Adaptations in Individuals following ACLR via Patellar Tendon Autograft. American Society of Biomechanics. August 2025. Pittsburgh, PA.
2. **White MS**, Owen MK, Schmitz CB, Conley CE, Stone AV, Hardy PA, Noehren B. Differences in Vastus Lateralis Muscle Architecture in Individuals with a Patellar Dislocation. Orthopedic Research Society Annual Meeting. February 2025. Phoenix, AZ.

3. *Horikawa-Strakovsky A, ***White MS**, Arenas Florez MN, Jones L, Noehren B, Wen Y. Automatic segmentation for measuring vastus lateralis muscle quality and size from B-mode ultrasound. Orthopedic Research Society Annual Meeting. February 2025. Phoenix, AZ. *Denotes co-first author
4. Cardon JL, Noehren B, **White MS**. Influence of Region of Interest Size on Vastus Lateralis Shear Wave Velocity in Individuals with Anterior Cruciate Ligament Reconstruction. American College of Sports Medicine Southwest Chapter. October 2024. Irvine, CA.
5. Garcia SA, **White MS**, Palmieri-Smith RM. Between Limb Differences in Gait Complexity and Associations with Cartilage Deformation in Individuals with ACL Reconstruction. American Society of Biomechanics. August 2024. Madison, WI.
6. Janatova T, Noehren B, **White MS**. Associations between patella tendon and vastus lateralis shear-wave velocity, walking mechanics, and quadriceps strength after ACL reconstruction. American Society of Biomechanics. August 2024. Madison, WI.
7. **White MS**, Garcia SA, Pang Y, Casey CM, Palmieri-Smith RM, Lepley LK. Alterations in Patellofemoral Cartilage Composition are not Associated with Quadriceps Size and Strength following ACL Reconstruction. American Society of Biomechanics. August 2024. Madison, WI.
8. Garcia SA, **White MS**, Palmieri-Smith RM. Associations Between Sagittal Plane Knee Complexity and Exercise-Induced Changes in Cartilage Thickness and Echogenicity in individuals with ACL-Reconstruction. Osteoarthritis and Cartilage. April 2024. Vienna, Austria.
9. Graham MC, Janatova T, **White MS**, Reeves KA, Noehren B. Words Matter! The Effects of Instruction on Quadriceps Rate of Torque Development after ACL Reconstruction. American College of Sports Medicine. May 2024. Boston, MA.
10. **White MS**, Owen MK, Fry CS, Hardy PA, Noehren B. Intramuscular Fat Negatively Impacts Quadriceps Function in Individuals with Knee Osteoarthritis. American College of Sports Medicine. May 2024. Boston, MA.
11. **White MS**, Ogier AC, Chenevert LC, Zucker E, Stoneback L, Michel CP, Palmieri-Smith RM, Lepley LK. Intramuscular Fat Infiltration Following ACL Reconstruction. Orthopedic Research Society Annual Meeting. February 2024. Long Beach, CA.
12. **White MS**, Mancini LM, Stoneback L, Palmieri-Smith RM, Lepley LK. Chronic Adaptions In Quadricep Fascicle Mechanics Are Related To The Magnitude And Rate of Joint Loading After ACL Reconstruction. Orthopedic Research Society Annual Meeting. February 2024. Long Beach, CA.
13. Garcia SA, **White MS**, Kahan S, Gallegos J, Balza I, Palmieri-Smith RM. Body Mass Index and Walking Biomechanics Predict Trochlear Cartilage Strain in Individuals with Anterior Cruciate Ligament Reconstruction. American Society of Biomechanics. August 2023. Knoxville, TN.
14. Gallegos J, Balza I, Garcia SA, Palmieri-Smith RM, **White MS**, Kahan S. Sex Differences in Walking Biomechanics and Femoral Cartilage Properties in those with Anterior Cruciate Ligament Reconstruction. American Society of Biomechanics. August 2023. Knoxville, TN.

15. Balza I, Gallegos J, Garcia SA, Kahan S, **White MS**, Palmieri-Smith RM. Differences in Walking Biomechanics and Cartilage Function During Sloped and Level Walking in Persons with Anterior Cruciate Ligament Reconstruction. American Society of Biomechanics. August 2023. Knoxville, TN.
16. Stoneback L, Fullano GD, **White MS**, Naaz S, Lepley LK. Development of a Low-Cost Biocompatible EMG electrode: Sensitivity, Reliability, and Instructions for Fabrication. American Society of Biomechanics. August 2023. Knoxville, TN.
17. Garcia SA, **White MS**, Kahan S, Balza I, Gallegos J, Palmieri-Smith RM. Ultrasonographic Assessments of Trochlear Cartilage Before and After Incline Walking in Persons with Anterior Cruciate Ligament Reconstruction. American College of Sports Medicine. June 2023. Denver, CO.
18. **White MS**, Palmieri-Smith RM, Lepley LK. Open-sourced Semi-automatic Program for Ultrasound Assessments of Femoral Trochlea Cartilage Thickness. ACL Retreat IX. March 2022. High Point, NC.
19. **White MS**, Casey CM, Lepley LK. Open-sourced Semi-automatic Program to Standardize and Expand Clinically Accessible Ultrasound Assessments of Patellofemoral Cartilage Health. Orthopaedic Research Society Annual Meeting. February 2022. Tampa, FL.
20. **White MS**, Davi SM, Brancati RJ, Lepley LK. Alterations in gait and knee joint alignment substantiate new PTOA rodent model of ACL injury. Presented at Orthopaedic Research Society Annual Meeting. February 2020. Phoenix, AZ.
21. **White MS**, Burland JP, Davi SM, Lepley AS, Lepley LK. Hidden Asymmetries in ACLR Patients Who Pass Triple Hop Test Following ACLR. Presented at ACL Research Retreat VIII. March 2019. Greensboro, NC.
22. Lepley LK, **White MS**, Davi SM, Brancati RJ. Novel pre-clinical model of post-traumatic osteoarthritis demonstrates unicompartamental declines in trabecular bone volume. Orthopaedic Research Society Annual Meeting. February 2020. Phoenix, AZ. **Preclinical Model Section Award Finalist.**
23. Davi SM, **White MS**, Kwon OS, Lepley LK. The Role of Mitochondrial Dysfunction and Redox Disturbances After Non-Invasive Anterior Cruciate Ligament Injury. American College of Sports Medicine. June 2020.
24. Davi SM, **White MS**, Kwon OS, Lepley LK. Preclinical Model of ACL Injury Reveals the Acute Time Course of Mitochondrial Dysfunction in the Vastus Lateralis. National Athletic Trainer's Association. July 2020. Virtual.
25. Kwon OS, Davi SM, **White MS**, Lepley LK. The Role of Mitochondrial-derived Reactive Oxygen Species in Non-Invasive Anterior Cruciate Ligament Injury. Experimental Biology. April 2020. Conference cancelled due to COVID-19.