

Amy L. Lenz, Ph.D.

Curriculum Vitae

Education:

- August 2013 - August 2017 Michigan State University
PhD Engineering Mechanics
Dissertation Title: *"A Synergistic Approach to Transtibial Socket Interface Mechanics: Experiments and Modeling"*
Advisor: Tamara Reid Bush, PhD
Committee Members: Sara Roccabianca, PhD; Patrick Kwon, PhD; Laura Bix, PhD
- August 2010 - August 2012 University of Delaware
MS Mechanical Engineering
Thesis Title: *"Lower Extremity Coordination Patterns and Muscle Contributions in Post-Stroke Gait Based on Self-Selected Walking Speed Classification"*
Advisor: Jill Higginson, PhD
Committee Members: Thomas Buchanan, PhD; Darcy Reisman, PT, PhD
- August 2006 - May 2010 University of Wisconsin – Madison
BS Biomedical Engineering
Graduated with Honors in Research and Biology in Engineering Certificate
Senior Thesis Title: *"Dynamic Hamstring Function during Gait"*
Advisor: Darryl Thelen, PhD
Committee Member: James McCarthy, MD, MHCM

Professional Experience:

- July 2023 – Assistant Professor, Principal Investigator
Orthopaedic Research Laboratory
Department of Orthopaedics, University of Utah
Department of Biomedical Engineering, University of Utah
- December 2020 – Adjunct Faculty
Department of Mechanical Engineering, University of Utah
- January 2020 – WOC Research Staff Affiliation (Work without Compensation)
Salt Lake City Veterans Affairs Hospital
- April 2020 – July 2023 Research Instructor, Principal Investigator
Orthopaedic Research Laboratory
Department of Orthopaedics, University of Utah
- May 2021 – July 2023 Adjunct Faculty
Department of Biomedical Engineering, University of Utah
- August 2017 – April 2020 Postdoctoral Research Associate with Andrew Anderson, PhD
Orthopaedic Research Laboratory
Department of Orthopaedics, University of Utah

August 2016 – August 2017	Visiting Professor in Mechanical Engineering Padnos College of Engineering & Computing, Grand Valley State University
August 2015 – August 2016	Visiting Professor in Product, Design and Manufacturing Engineering Padnos College of Engineering & Computing, Grand Valley State University
April 2015 – August 2015	Research Engineer, J.F. Butzer Center for Research & Innovation Mary Free Bed Rehabilitation Hospital
January 2013 – August 2017	Adjunct Faculty: Preceptor Perks Program Department of Physical Therapy, Grand Valley State University
July 2012 – July 2017	Gait Lab Engineer/Site Manager, Motion Analysis Center Mary Free Bed Rehabilitation Hospital
January 2009 – August 2009	Engineering Internship Environmental Health Engineering Co-op Program University Health Services, University of Wisconsin - Madison

Honors and Awards:

James A Nunley MD Visiting Professor, Duke University (2023)
American Society of Biomechanics Early Career Achievement Award (2022)
Young Scientist Novel Loadsol Contest Winner (2019)
Stryker/ORS Women's Research Fellowship Awardee (2019)
Orthopaedic Research Society New Investigator Recognition Award Finalist (2019)
NextProf Nexus Future Engineering Faculty Workshop Awardee (2018)
LS Peery Foundation Scholar Award University of Utah (Fall 2017-Fall 2018)
Future Academic Scholars in Teaching (FAST) Fellowship (Fall 2015-Spring 2016)
DewGood Public Service Technology Award: 2nd Place (Spring 2015 MSU Graduate Research Symposium)
MSU Graduate Office Fellowship (Summer 2015)
MSU Mechanical Engineering Fellowship (Spring 2015)
Society of Women Engineers Past Presidents Scholarship (2014-2015)
Michigan State University Women's Resource Center William E. and Phoebe B. Clarke Scholarship (2014)
Gait and Clinical Movement Analysis Society Student Travel Scholarship (2011)
University of Delaware Professional Development Award (2011)
1st Place in UW-Madison Mechanical Engineering Undergraduate Research Symposium (2009)
UW-Madison Biomedical Engineering Design Competition Honorable Mention (2008)
Society of Women Engineers Brill Family Scholarship (2008-2009)
Dean's Honor List: Biomedical Engineering (Fall 2008, Fall 2009-Spring 2010)
Dean's Honor List: College of Engineering (Spring 2006-Fall 2007)
4-H Waukesha County Leadership Scholarship (2007-2008)
Society of Manufacturing Engineers E. Wayne Kay High School Scholarship (2006-2007)
Evangelical and Reformed United Church of Christ Engineering Scholarship (2006-2010)

Professional Service Positions:

Foot and Ankle International/Foot and Ankle Orthopaedics

- Specialty Content Assistant Editor (2022 – present)

Journal of Orthopaedic Research

- Editorial board member (2021 – present)

Frontiers in Bioengineering and Biotechnology

- Review Editor (2023 – present)

Orthopaedic Research Society

- Foot and Ankle Research Interest Group Committee (2021 – present)

American Society of Biomechanics

- University of Utah Student Chapter Faculty co-Advisor (2022 – present)
- Early Career Faculty Affinity Group Member (2020 – present)
- Rocky Mountain Regional Meeting Organizer (2022 – 2023)
- Annual Conference Program Committee Member (2020 – 2021)
- ASB Student Representative and Executive Board Member (2014 – 2016)
- Education Committee Member (2014 – 2016)
- Diversity Committee Member (2014 – 2016)

Gait and Clinical Movement Analysis Society

- Awards Council Chair and Executive Board Member (2021 – 2023)
- GCMAS Standards Committee Member (2012 – 2017)

Biomedical Engineering Society: Student Chapter University of Wisconsin-Madison

- Chair: CRUISE (Counseling and Research for Undergraduates in Science and Engineering) (2007-2008)
- Industry/Research Co-chair (2009-2010)

University of Wisconsin-Madison Biomedical Engineering Department

- Biomedical Student Advisory Committee Chair: Liaison to students and faculty (2008-2010)

Conference Session Moderator

2020 American Society of Biomechanics: Orthopaedics I

2021 International Foot and Ankle Biomechanics Society: Kinematics Methodological Aspects II

2022 World Congress of Biomechanics: Ankle and Foot Biomechanics

2022 North American Congress of Biomechanics: Imaging I - Bone

Professional Memberships

International Weightbearing Computed Tomography (WBCT) Society (2020 – present)

Orthopaedic Research Society (2017 – present)

American Society of Mechanical Engineers (2014 – present)

Gait and Clinical Movement Analysis Society (2011 – present)

American Society of Biomechanics (2008 – present)

Society of Women Engineers (2006 – present)

Society of Manufacturing Engineers (2006 – 2012)

Biomedical Engineering Society (2006 – 2010)

Women in Science and Engineering (2006 – 2007)

Journal Reviewer

American Society of Mechanical Engineers Medical Devices Journal

American Society of Mechanical Engineers Biomechanical Engineering Journal

American Society of Mechanical Engineers Journal of Biomedical Engineering
Archives in Physical Medicine and Rehabilitation
Clinical Biomechanics
Computers in Biology and Medicine
Computer Methods in Biomechanics and Biomedical Engineering
Foot and Ankle International
Gait and Posture
Journal of Biomechanics
Journal of Engineering in Medicine
Journal of Orthopaedic Research
Nature Scientific Reports

Teaching Experience:

Courses Taught

University of Utah

BME 4250 Biomechanics I (Fall 2023)

Grand Valley State University

EGR 345 Dynamic System Modeling and Control (Fall 2015)

EGR 220 Engineering Measurement and Data Analysis (Winter 2016)

EGR 309 Machine Design I (Winter 2016, Winter 2017)

EGR 290 Co-op Advising (Summer 2016)

EGR 346 Mechatronic Systems Dynamics and Control (Fall 2016)

EGR 490 Co-op Advising (Fall 2016)

EGR 499 Research in Engineering (Fall 2016)

EGR 390 Engineering Co-op II (Winter 2017)

Guest Lectures

University of Utah Biomechanics I Guest Lecturer October 27, 2022

American Society of Mechanical Engineers Student Chapter Meeting February 2, 2017

Hope College Rehabilitation Engineering Course Guest Lecturer October 12, 2016

Grand Valley State University Engineering Guest Lecturer April 14, 2016

Grand Valley State University Engineering Guest Lecturer April 14, 2015

Grand Valley State University Engineering Guest Lecturer April 9, 2014

Hope College Rehabilitation Engineering Course Guest Lecturer October 2 & 9, 2014

Grand Valley State University Engineering Seminar Guest Lecturer April 9, 2013

Hope College Rehabilitation Engineering Course Guest Lecturer September 13, 2012

Mary Free Bed Rehabilitation Hospital Grand Rounds August 2012, April 2013, October 2013, June 2014, October 2014

Advising and Mentoring Experiences

PhD Dissertation Advisor for Graduate Students at the University of Utah

Renae Lapins, BS – Biomedical Engineering (July 2023 – present)

Melissa Requist, BS – Biomedical Engineering (June 2023 – present)

Katrina Cernucan, BS – Mechanical Engineering (July 2022 – present)

Tony Le, MS - Biomedical Engineering (January 2022 – present)

Kassidy Knutson, MS - Mechanical Engineering (August 2021 – present)

Research Fellows/Postdoctoral Fellows

Takuma Miyamoto, MD-PhD (July 2022 – present)

MS Thesis/Project Advisor for Graduate Students at the University of Utah

Jordy Larrea Rodriguez, BS – Electrical and Computer Engineering (January 2024 – present)
Katee Perez, BS – Biomedical Engineering (January 2023 – December 2023)
Zach Eatough, BS – Clinical Investigation (May 2022 – May 2023)
Andrew Peterson, BS - Mechanical Engineering (January 2022 – May 2023)
Rich Lisonbee, BS - Biomedical Engineering (July 2020 – May 2022)

Medical Students

Kyle Pauly, University of Nevada-Reno (May 2023 – present)
Alayna Arnholt, University of Utah (October 2022 – present)
Jayson Nelson, University of Utah (August 2022 – present)
Jacob Benna, University of Nevada-Reno (June 2022 – present)
Melissa Request, MD/PhD program at the University of Utah (June 2021 – present)
Steven Elicegui, University of Nevada-Reno (June 2021 – present)
Tyler Rogers, University of Nevada-Reno (June 2021 – June 2022)

Research Mentor for Undergraduate Research Assistants in the Orthopaedic Research Laboratory

Jordan Langford** (October 2023 – present)
Annika Bachman** (October 2023 – present)
Eliana Moreno** (October 2023 – present)
Meghan Carter#* (May 2023 – present)
Erika Muhlrads~** (January 2020 – present)
Jordy Larrea Rodriguez# (May 2022 – January 2024)
Miranda Nicholson~ (January 2021 – January 2023)
Katee Perez** (January 2020 – January 2023)
Florence Thirwell (July 2022 – September 2022)
Jayson Nelson (November 2021 – August 2022)
Zach Eatough# (May 2021 – May 2022)
Andrew Peterson** (August 2018 – August 2021)
Rich Lisonbee** (January 2018 – July 2020)
Lindsay Schuring** (August 2017 – May 2020)
Kaleb Howell*^ (January 2018 – August 2019)
Dylan Blair** (August 2017 – August 2019)
Joe Hartle# (August 2017 – March 2019)
Bernard Li# (June 2018 – December 2018)
Kosta Karpos# (August 2017 – July 2018)
YoungJae Shin# (August 2017 – May 2018)
Sam Colby# (August 2017 – December 2017)
Spencer Kendell# (August 2017 – December 2017)
Justin Skinner# (August 2017 – December 2017)

*Mentor for University of Utah Biomedical Engineering Undergraduate Thesis

**Mentor for University of Utah Biomedical Engineering BS/MS Thesis

^Student won Best Poster for Senior Thesis Competition

#Undergraduate Research Opportunity Program Funding (UROP)

~Engineering Scholars Program

≈Merrill Engineering Scholars Program

◇Summer Program for Undergraduate Research (SPUR)

Mentor to Visiting Research Students in the Orthopaedic Research Laboratory
Melissa Requist, Biomedical Eng Undergraduate, University of Arizona (May 2020 – May 2021)

NASA Micro-g NExT Design Competition Faculty Advisor
Grand Valley North Stars Surface Sampler Project
Finals at NASA Johnson Space Center (May 2017)

Engineering Senior Design Faculty Review Panel at Grand Valley State University
Team Magna-Robotic Illuminance Scanner (April 2016)
E-Zee Set Wood Products (April 2016)
Educational Solar Module (April 2016)

Committee Member with Gordy Alderink, PhD and Barb Hoogenboom, PT, EdD for Physical Therapy
Students Capstone Research Thesis at Grand Valley State University
Topic: Hip Joint Center Research Methods in Motion Analysis
Students: Taylor Spitzley, Wesley Barger, Ryan Gailey
July 2016 – August 2017

Committee Member with Gordy Alderink, PhD and Barb Hoogenboom, PT, EdD for Physical Therapy
Students Capstone Research Thesis at Grand Valley State University
Topic: Comparison of Plug-In Gait and Mary Free Bed Biomechanical Models: Effect on Hip Joint
Center Location and Resulting Kinematic/Kinetic Differences
Students: Nathan Keniston, Alyssa Krikke, Ben Wiersma
July 2014 – August 2015

Co-advised with Mitch Barr Physical Therapy Students at Grand Valley State University for their
Capstone Research Thesis
Topic: Impact of Various Ankle-Foot Orthotic Designs on Pathologic Sagittal Plane Knee Motion
in the Stance Phase of Gait: A Retrospective Review
Students: Kayla Holtz, Abby Dull, Saxony Matousek
January 2013 – July 2014

Co-op/Internship Mentor for Engineering Undergraduate Students
at Mary Free Bed Rehabilitation Hospital in Motion Analysis Center
Alexandria Case from Grand Valley State University (Winter 2016-Summer 2017)
Curtis Ackermann from Lawrence Technological University (Summer 2016)
Sydney Chaney from Michigan Technological University (Summer 2016)
Kate Clarke from University of Notre Dame (Summer 2016)
Alyssa Messner from Wayne State University (Fall 2016)
Brooke Draggoo from Hope College (Winter 2017)

Internship Mentor for Grand Valley State University Clinical Exercise Science Degree
at Mary Free Bed Rehabilitation Hospital in Motion Analysis Center
Krista Siegert (Summer 2012)
Justin Van Dyke (Fall 2012)
Emily Machiela (Winter 2013)
Chris Werth (Summer 2013)
Chelsea Warren (Fall 2013)
Alyssa Gantz (Winter 2014)
Alisha Lange (Summer 2014)

Connor McGee (Fall 2014)
Derek Ainsley (Winter 2015)
Kelsey Cecilio (Summer 2015)
Abade Sharif (Fall 2015)
Daniel Burchett (Fall 2015)
Sarah Veldman (Winter 2016)
Gene Lanier (Winter 2016)
Morgan Burke (Summer 2016)
Nick Feldpausch (Fall 2016)
Kevin Amidon (Fall 2016)
Breanna Fink (Winter 2017)
Jordan Krygsheld (Winter 2017)
Rachel Bendewald (Winter 2017)

Internship Mentor of Masters Students in Kinesiology/Biomechanics at Mary Free Bed Rehabilitation Hospital in Motion Analysis Center

Micah Garcia from University of Kentucky (Winter/Summer 2015)
Alyna Ciaciuch from University of Michigan (Summer 2015)

Co-advised with Cathy Harro a Physical Therapist Resident at Mary Free Bed DPT Residency for her research project

Topic: Carryover Effects of Functional Electrical Stimulation Intervention on Dynamic Balance Control During Ambulatory Mobility Challenges in Children with Spastic Hemiplegic Cerebral Palsy

Student: Kate Rustem, PT, DPT October 2012-October 2013

External Mentor to Master's students of Blake Ashby
Grand Valley State University College of Engineering
Fall 2012 – Fall 2015

Student Reviews and Teaching Assessment Scores

University of Utah

BME 4250 Biomechanics I (Fall 2023)

82 out of 98 responded to the following prompts:

1) I would recommend this instructor:

98.6% Yes; 1.4% No

2) Overall, this was an effective instructor:

77.5% Strongly Agree; 20% Agree; 1.3% Mildly Disagree; 1.3% Disagree

Student comments:

"This professor is amazing at doing her job. She cares about all of her students and is sensible about examining rigorous material."

"Top BME professor in my time here. She is a tough grader but makes expectations incredibly clear and it is glaringly obvious that she genuinely cares about her students. If you want to succeed in this class you will."

"Dr. Lenz is one of the best professors I have ever had not only in the BME department but in the university as a whole. I wish all of my professors taught like and cared as much as Dr. Lenz."

Grand Valley State University

EGR 345 Dynamic System Modeling and Control (Fall 2015)

22 out of 26 responded to examples of the following prompts:

Amy L. Lenz, PhD: CV

“The course was taught well”

55% Strongly Agree; 32% Agree

“I have benefitted by having this instructor.”

64% Strongly Agree; 31% Agree

EGR 220 Engineering Measurement and Data Analysis (Winter 2016)

23 out of 29 responded

Overall Summative Rating: 4/5

Challenge and Engagement Index: 5.5/7

“She was always available for questions, consistently gave back feedback quickly, and graded on a timely manner. Always re-explained things if students had confusion and was very thorough with all explanations.”

EGR 309 Machine Design I (Winter 2016)

25 out of 26 responded

Overall Summative Rating: 4.2/5

Challenge and Engagement Index: 5.6/7

“The instructor was highly effective in explaining difficult concepts and execution of labs.”

EGR 346 Mechatronic Systems Dynamics and Control (Fall 2016)

71 out of 84 responded

Overall Summative Rating: 4.1/5

Challenge and Engagement Index: 5.3/7

“Professor Lenz had great knowledge and enthusiasm for the course. I would like to take more courses where she is the instructor so the material is exciting to learn.”

EGR 309 Machine Design I (Winter 2017)

39 out of 53 responded

Overall Summative Rating: 4.8/5

Challenge and Engagement Index: 5.7/7

“It is clear from how she presents the material that she truly enjoys teaching engineering, and that makes learning from her very enjoyable as well. She is able to provide excellent explanations of concepts and relating them to real life as well.”

Tutoring

August 2012 – May 2013

Tutor for an engineering student at Grand Valley State University
Topics: Chemistry, General Engineering, Physics

April 2018 – October 2019

Tutor for 7th through 12th grade students at Faris Education
Topics: ACT prep, Algebra, Biology, Calculus, Chemistry, Geometry, Medical Terminology, Physics, SAT prep, Statistics

Consulting:

Engineering in Movement, LLC
Consultant and Owner

February 2012 – Present

Previous Contracts (No active contracts or clients since 2017)

- Grand Valley State University Physical Therapy Department
 - Biomechanics Laboratory (Fall 2012)

- University of Michigan-Flint Physical Therapy Department
 - Sports Medicine Assessment and Rehabilitation Laboratory (Fall 2016)

Outreach:

National Biomechanics Day Teaching Demonstrations (2019, 2020, 2021, 2022, 2023)
 Girls Engineering Night hosted by Greater Salt Lake Section of the Society of Women Engineers (2018)
 Utah Science and Engineering Fair (USEF) Secondary Judge Volunteer (2018)
 STEPS Faculty Mentor (2016-2017)
 Bikes for the Rest of Us: Mary Free Bed Rehabilitation Hospital (2013-2015)
 Habitat for Humanity Trip with Biomedical Engineering Society (2009)

Peer-Reviewed Journal Publications:

1. Requist, M.R., Mills, M. K., Carroll, K. L., **Lenz, A. L.** (2023). Quantitative Skeletal Imaging and Image-Based Modeling in Pediatric Orthopaedics, *Current Osteoporosis Reports*, Accepted.
2. Peterson, A. C., Kruger, K. M., **Lenz, A. L.** (2023). Automatic Anatomical Foot and Ankle Coordinate Toolbox, *Frontiers in Bioengineering and Biotechnology*, Accepted.
3. Requist, M. R., Rolvien, T., Barg, A., **Lenz, A. L.** (2023). Morphologic Analysis of the 1st and 2nd Tarsometatarsal Joint Articular Surfaces, *Scientific Reports*, Accepted.
4. Knutson, K., Peterson, A. C., Lisonbee, R. J., Hintermann, B., Krähenbühl, N., **Lenz, A. L.** (2023). Joint Coverage Analysis in Progressive Collapsing Foot Deformity, *Journal of Orthopaedic Research*, epub online ahead of print.
5. Khan, N., Peterson, A. C., Aubert, B., Atkins, P. R., **Lenz, A. L.**, Anderson, A. E., Elhabian, S. Y. (2023). Statistical Multi-Level Shape Models for Scalable Modeling of Multi-Organ Anatomies, *Frontiers in Bioengineering and Biotechnology*, 16(11): 1089113.
6. Schuring, L. L., Mozingo, J. D., **Lenz, A. L.**, Uemura, K., Atkins, P. R., Fiorentino, N. M., Aoki, S. K., Peters, C. L., Anderson, A. E. (2022). Acetabular Labrum and Cartilage Contact Mechanics During Pivoting and Walking Tasks in Individuals with Cam Femoroacetabular Impingement Syndrome, *Journal of Biomechanics*, 1(146): 111424.
7. Peterson, A. C., Lisonbee, R. J., Khan, N., Krähenbühl, N., Saltzman, C. L., Barg, A., Khan, N., Elhabian, S., **Lenz, A. L.** (2022). Multi-Level Multi-Domain Statistical Shape Model of the Subtalar, Talonavicular and Calcaneocuboid Joints, *Frontiers in Bioengineering and Biotechnology*, 12(10): 1056536. ***Invited Submission: Statistical Model-Based Computational Biomechanics: Applications in Joints and Internal Organs***
8. **Lenz, A. L.**, Lisonbee, R. J. (2023). Biomedical Insights Afforded by Statistical Shape Modeling in the Foot and Ankle, *Foot and Ankle Clinics*, 28(1): 63-76. ***Invited Submission: Special Issue of Comprehensive Review of Foot and Ankle Biomechanics Topics***
9. Takahashi, K., Krupenevich, B., **Lenz, A. L.**, Kelly, L. A., Rainbow, M. J., Franz, J. R. (2022). Mechanics and Energetics of Human Feet: A Contemporary Perspective for Understanding Mobility Impairments in Older Adults, *Biomechanics*, 2(4), 494-499. ***Special Issue: Encouraging More Youthful Mechanics and Energetics of Locomotion through Intervention for Older Adults**

10. Cardon, J. J., DeKeyser, G. J., Peterson, A. C., Higgins, T. F., **Lenz, A. L.**, Haller, J. M. (2022). Medial Head of the Gastrocnemius Tenotomy Through a Posteromedial Approach Significantly Improves Surgical Accessibility of the Tibial Plateau, *The Journal of Orthopaedic Trauma*, 37(1), 44-49.
11. Campbell, M. L., **Lenz, A. L.**, Peterson, A. C., DeKeyser, G. J., Haller, J. M., O'Neill, D. C. (2022). Dual Approach to Talar Dome Access Increases Access For Fracture Care Without Osteotomy, *Foot and Ankle International*, 43(11), 1474-1481.
12. Lewis, C. A., Uemura, K., Atkins, P. R., **Lenz, A. L.**, Fiorentino, N. M., Aoki, S. K., Anderson, A. E. (2022). Patients with Cam-Type Femoroacetabular Impingement Demonstrate Increased Change in Bone-to-Bone Distance during Walking: A Dual Fluoroscopy Study, *Journal of Orthopaedic Research*, 41(1), 161-169.
13. **Lenz, A. L.**, Lisonbee, R. J., Peterson, A. C., Roach, K. E., Foreman, K. B., Barg, A., Anderson, A. E. (2022). Total Ankle Replacement Provides Symmetrical Post-Operative Kinematics: A Biplane Fluoroscopy Imaging Study, *Foot and Ankle International*, 43(6), 818-829.
14. DeKeyser, G. J., O'Neill, D. C., Sripanich, Y., **Lenz, A. L.**, Haller, J. M., Barg, A. (2021). Talar Dome Access Through Posteromedial Surgical Intervals for Fracture Care, *Foot and Ankle International*, 43(2), 223-232.
15. Requist, M. R., Sripanich, Y., Rolvien, T., **^Lenz, A. L.**, **^Barg, A.** (2021). Micro-CT Analysis of the Lisfranc Complex Reveals Higher Bone Mineral Density in Dorsal Compared to Plantar Regions, *Journal of Orthopaedic Research*, 40(6), 1457-1469.
16. *Burssens, A., *Krähenbühl, N., **Lenz, A. L.**, Howell, K., Zhang, C., Sripanich, Y., Saltzman, C. L., Barg, A. (2021). Interaction of Loading and Ligament Injuries in Subtalar Joint Instability assessed by 3D Weightbearing Computed Tomography, *Journal of Orthopaedic Research*, 40(4), 933-944.
17. ***Lenz, A. L.**, *Krähenbühl, N., Peterson, A. C., Lisonbee, R. J., Hintermann, B., Saltzman, C. L., Barg, A., Anderson, A. E. (2021). Statistical shape modeling of the talocrural joint using a hybrid multi-articulation joint approach, *Nature Scientific Reports*, 11(1), 7314.
18. DeKeyser, G. J., Sripanich, Y., O'Neill, D. C., **Lenz, A. L.**, Haller, J. M., Saltzman, C. L., Barg, A. (2021). Mapping of Posterior Talar Dome Access Through Posteromedial versus Posterolateral Approaches, *The Journal of Orthopaedic Trauma*, 35(12), 463-469.
19. **Lenz, A. L.**, Strobel, M. A., Anderson, A. M., Fial, A. V., MacWilliams, B. A., Krzak, J. J., Kruger, K. M. (2021). Assignment of Local Coordinate Systems and Methods to Calculate Tibiotalar and Subtalar Kinematics: A Systematic Review, *Journal of Biomechanics*, 7(120), 1-15.
20. Sripanich, Y., Steadman, J., Krähenbühl, N., Rungprai, C., Saltzman, C. L., **^Lenz, A. L.**, **^Barg, A.** (2021). Anatomy and Biomechanics of Lisfranc Ligamentous Complex: A Systematic Literature Review, *Journal of Biomechanics*, 15(119), 1-10.
21. *Requist, M. R., *Sripanich, Y., Peterson, A. C., Rolvien, T., **^Barg, A.**, **^Lenz, A. L.** (2021). Semi-Automatic Micro-CT Segmentation of the Midfoot Using Calibrated Thresholds, *International Journal of Computer Assisted Radiology and Surgery*, 38(12), 2625-2633.
22. *Krähenbühl, N., ***Lenz, A. L.**, Lisonbee, R. J., Peterson, A. C., Atkins, P. R., Hintermann, B., Saltzman, C. L., Anderson, A. E., Barg, A. (2020). Morphologic Analysis of the Subtalar Joint Using Statistical Shape Modeling, *Journal of Orthopaedic Research*, 38(12), 2625-2633.

23. *Burssens, A., *Krähenbühl, N., Weinberg, M., **Lenz, A. L.**, Saltzman, C. L., Barg, A. (2020). Comparison of External Torque to Axial Loading in Detecting 3-Dimensional Displacement of Syndesmotic Ankle Injuries, *Foot and Ankle International*, 41(10), 1256-1268.
24. Blair, D. J., Barg, A., Foreman, K. B., Anderson, A. E., **Lenz, A. L.** (2020). Methodology for Measurement of In Vivo Tibiotalar Kinematics After Total Ankle Replacement Using Dual Fluoroscopy, *Frontiers in Bioengineering and Biotechnology*, 5(8), 1-12. ****Invited paper submission in: Medical Imaging for Design and Biomechanical Optimization of Personalized Medical Devices****
25. **Lenz, A. L.**, Nichols, J. A., Roach, K. E., Foreman, K. B., Barg, A., Saltzman, C. L., Anderson, A. E. (2020). Compensatory Motion of the Subtalar Joint Following Tibiotalar Arthrodesis: An In-Vivo Dual-Fluoroscopy Imaging Study, *Journal of Bone and Joint Surgery American*, 102(7), 600-608.
26. Krähenbühl, N., Akkaya, M., Dodd, A. E., Hintermann, B., Dutilh, G., **Lenz, A. L.**, Barg, A. (2019). Impact of Ankle Rotation on Syndesmotic Measurements, *Foot and Ankle Surgery*, 11(19), 1-8.
27. **Lenz, A. L.**, Bush, T. R. (2019). Evaluating Shear and Normal Force with the use of an Instrumented Transtibial Socket: A Case Study, *Medical Engineering and Physics* 71(9), 102-107.
28. ***Lenz, A. L.**, *Krähenbühl, N., Howell, K., Lisonbee, R., Hintermann, B., Saltzman, C. L., Barg, A. (2019). Influence of the Ankle Position and X-Ray Beam Angulation on the Projection of the Posterior Facet of the Subtalar Joint, *Skeletal Radiology*, 48(10), 1581-1589.
29. *Krähenbühl, N., ***Lenz, A. L.**, Lisonbee, R., Deforth, M., Zwicky, L., Hintermann, B., Saltzman, C. L., Anderson, A. E., Barg, A. (2018). Imaging of the Subtalar Joint: A Novel Approach to an Old Problem, *Journal of Orthopaedic Research* 1(14), 1-6.
30. **Lenz, A. L.**, Johnson, K. A., Bush, T. R. (2018). Understanding Displacements of the Gel Liner for Below Knee Prosthetic Users, *ASME Journal of Biomechanical Engineering* 140(9), 1-5.
31. **Lenz, A. L.**, Johnson, K. A., Bush, T. R. (2018). A New Method to Quantify Residual Limb Motion within a Prosthetic Socket for Below Knee Amputees, *Journal of Biomechanics* 6(74), 213-219.
32. Lenhart, R. L., Francis, C. A., **Lenz, A. L.**, Thelen, D. G. (2014). Empirical Evaluation of Gastrocnemius and Soleus Function During Walking, *Journal of Biomechanics* 47(12), 2969-2974.
33. Francis, C. A., **Lenz, A. L.**, Lenhart, R. L., Thelen, D. G. (2013). The Modulation of Forward Propulsion, Vertical Support, and Center of Pressure by the Plantarflexors during Human Walking, *Gait and Posture* 38(4), 993-997.
34. Thelen, D. G., **Lenz, A. L.**, Francis, C., Lenhart, R., Hernández, A. (2013). Empirical Assessment of Dynamic Hamstring Function during Human Walking, *Journal of Biomechanics* 46(7), 1255-1261.
35. Hernández, A., **Lenz, A. L.**, Thelen, D. G. (2010). Electrical Stimulation of the Rectus Femoris During Pre-Swing Diminishes Hip and Knee Flexion During the Swing Phase of Normal Gait, *IEEE Transactions on Neural Systems and Rehabilitation Engineering: A Publication of the IEEE Engineering in Medicine and Biology Society* 18(5), 523-530.

* Denotes authors contributed equally to development of the article and are co-first authors.

^ Denotes equally contributed senior/corresponding authors.

Book Chapters:

1. **Lenz, A. L.**, (2022). Kinematics Chapter in the *Winter Biomechanics and Motor Control of Human Movement*, 5th edition.

Peer-Reviewed Procedia:

1. Thelen, D. G., **Lenz, A.**, Hernandez, A. (2011). Measurement and simulation of joint motion induced via biarticular muscles during human walking, *Procedia IUTAM* 2, 290-296.

Invited Talks:

1. **Lenz, A. L.** Foot and Ankle Biomechanics: Advanced Medical Imaging and Robotics to Investigate Form and Function, *University of Florida Biomedical Engineering Seminar*, Gainesville, FL, February 2024.
2. **Lenz, A. L.** Foot and Ankle Biomechanics: Empowering Clinical Interventions with Advanced Technology to Study 3D Morphology and Kinematics, *Medical College of Wisconsin Biomedical Engineering Seminar*, Milwaukee, WI, October 2023.
3. **Lenz, A. L.** Empowering Foot and Ankle Clinical Interventions with Advanced Technology to Study 3D Morphology and Kinematics, *University of Utah Orthopaedics Grand Rounds*, Milwaukee, WI, August 2023.
4. **Lenz, A. L.** Symposium: Standardizing Foot and Ankle Bone References, *International Society of Biomechanics*, Fukuoka, Japan, August 2023.
5. **Lenz, A. L.** Using Machine Learning to Improve Pre-Clinical Models and Clinical Image Interpretation in Foot and Ankle Orthopaedics, In Workshop: Machine Learning in Biomechanics and Imaging, *SB3C*, Vail, Colorado, June 2023.
6. **Lenz, A. L.** Empowering Foot and Ankle Clinical Interventions with Advanced Technology to Study 3D Morphology and Kinematics, *Duke University Orthopaedic Grand Rounds*, Durham, NC, May 24, 2023.
7. **Lenz, A. L.** Foot and Ankle Orthopaedic Biomechanics: Interactions Between Kinematics and Morphology, *UC-Davis Musculoskeletal Research Seminar*, Virtual, May 10, 2023.
8. **Lenz, A. L.**, Kruger, K. M., Ledoux, W. R., Seigler, S. Standardizing Terminology, 3D Spatial Orientations, and Relative Positioning of the Foot and Ankle Bones: An Expert Consensus, *8th Congress of the International Foot and Ankle Biomechanics*, Bordeaux, France, April 21, 2023.
9. **Lenz, A. L.** Enabling Technologies for Evaluating Foot and Ankle Morphology and Kinematics to Inform New Clinical Interventions, *University of North Carolina-Chapel Hill Orthopaedic Grand Rounds*, Chapel Hill, NC, March 30, 2023.
10. **Lenz, A. L.** Enabling Technologies for Measuring Deformity to Inform New Interventions to Treat Ankle OA, in Workshop: Ankle Osteoarthritis: Toward New Understanding and Opportunities for Intervention, *Orthopaedic Research Society*, Dallas, TX, February 2023.
11. **Lenz, A. L.** Foot and Ankle Biomechanics: Pathologic Interactions Between Kinematic and Morphology, *University of Utah Biomedical Engineering Department Seminar*, Salt Lake City, UT, December 2, 2022.

12. **Lenz, A. L.** and Kruger, K. M. World-wide Updates for Establishing Standardized Foot and Ankle Coordinate Systems, *World Congress of Biomechanics*, Taipei, Taiwan, July 2022.
13. **Lenz, A. L.** Ankle Osteoarthritis Evaluations and Modeling from Weightbearing CT, *World Congress of Biomechanics*, Taipei, Taiwan, July 2022.
14. **Lenz, A. L.** The Labyrinth of Foot and Ankle Biomechanics: Pathologic Interactions between Kinematics and Morphology, *Keynote speaker at the Rocky Mountain American Society of Biomechanics Regional Meeting*, Estes Park, CO, April 2022.
15. Elhabian, S., **Lenz, A. L.**, Atkins, P.R. ShapeWorks: An Integrated Suite for Anatomy Representation and Analysis Workshop, *International Symposium on Computer Methods in Biomechanics and Biomedical Engineering*, Bonn, Germany, September 2021.
16. Elhabian, S., **Lenz, A. L.** ShapeWorks: An Integrated Suite for Anatomy Representation and Analysis Workshop, *SB³C*, Virtual, June 2021.
17. **Lenz, A. L.**, Kruger, K. M. Assignment of Local Coordinate Systems and Methods to Calculate Tibiotalar and Subtalar Kinematics, Foot and Ankle Research Interest Group at the *Orthopaedic Research Society*, Virtual, February 2021.
18. Beveridge, J., Rainbow, M., Crisco, J., **Lenz, A. L.** Measuring Skeletal and Implant Arthrokinematics In-Vivo Workshop, *Orthopaedic Research Society*, Virtual, February 2021.
19. Murray, W., **Lenz, A. L.** Transitioning From Postdoc to Faculty Workshop, *American Society of Biomechanics*, Virtual, August 2020.
20. **Lenz, A. L.** Ankle Joint Complex Kinematics Following Surgical Intervention in Patients with End-Stage Osteoarthritis, *Marquette University Biomedical Engineering Department Seminar*, Milwaukee, WI, October 25, 2019.
21. **Lenz, A. L.**, Krähenbühl, N., Howell, K., Lisonbee, R., Hintermann, B., Saltzman, C. L., Barg, A. 3D Subtalar Joint Visualization: Utility of Weightbearing Computed Tomography, Quantitative Image-based Biomechanics Symposium: *International Society of Biomechanics/American Society of Biomechanics*, Calgary, AB, Canada, August 2019.

Conference Proceedings:

1. Peterson, A. C., Nelson, J. R., Benna, J. C., Elhabian, S., de Cesar Netto, C., Beals, T. C., **Lenz, A. L.** Charcot-Marie-Tooth Talar Morphology Analysis. In Review for the *Orthopaedic Research Society*, Long Beach, CA, February 2024.
2. Benna, J. C., Peterson, A. C., Arnholt, A., Anderson, D. D., Soltanolkotabi, M., Haller, J. M., **Lenz, A. L.** Analysis of Post-Traumatic Osteoarthritis and Clinical Outcomes in Post-Operative Pilon Fracture Patients: A Multivariate Analysis. In Review for the *Orthopaedic Research Society*, Long Beach, CA, February 2024.
3. Eatough, Z. J., Peterson, A. C., Lisonbee, R. J., Miyamoto, T., Tanaka, Y., Saltzman, C. L., Krahenbuhl, N., **Lenz, A. L.** Joint Angle Differences in Patients with Varus Ankle Osteoarthritis. In Review for the *Orthopaedic Research Society*, Long Beach, CA, February 2024.

4. Peterson, A. C., Benna, J. C., Anderson, D. D., Soltanolkotabi, M., Haller, J. M., **Lenz, A. L.** Longitudinal Statistical Shape Model Analysis of Post-Traumatic Osteoarthritis Development After Tibial Plafond Fractures. In Review for the *Orthopaedic Research Society*, Long Beach, CA, February 2024.
5. Lapins, E. R., Eatough, Z. J., Saltzman, C. L., Elhabian, S. Y., **Lenz, A. L.** Morphological Analysis of Isolated Subtalar Osteoarthritis via 21-Bone Statistical Shape Modeling of the Foot, In Review for the *Orthopaedic Research Society*, Long Beach, CA, February 2024.
6. Peterson, A. C., Kruger, K. M., **Lenz, A. L.** Foot and Ankle Automatic Anatomical Coordinate System Definition, Podium Presentation for the *International Society of Biomechanics*, Fukuoka, Japan, July 2023.
7. Le, A. H., Larrea Rodriguez, J. A., **Lenz, A. L.** Windlass Mechanism Engagement Influences Calcaneocuboid Joint Kinematics Within a Robotic-Driven Tibial Movement Envelope: A Preliminary Study, Podium Presentation for the *International Society of Biomechanics*, Fukuoka, Japan, July 2023.
8. Eatough, Z.J., Lisonbee, R. J., Krähenbühl, N., Mills, M.K., Saltzman, C.L., **Lenz, A. L.** Correlating Patient Specific Shape Scores with Severity of Varus Ankle Osteoarthritis, Podium Presentation for the 8th *International Congress of Foot and Ankle Biomechanics Conference*, Bordeaux, France, April 2023.
9. Lisonbee, R. J., Dibbern, K. N., Anderson, A. E., Saltzman, C. L., Kruger, K. M., **Lenz, A. L.** Statistical Shape Modeling Enables Identification of Subtalar Contact Stress Differences Following Tibiotalar Arthrodesis and Total Ankle Replacement, Podium Presentation for the 8th *International Foot and Ankle Biomechanics Conference*, Bordeaux, France, April 2023: **Best Paper Communication Award**.
10. Knutson, K., Peterson, A. C., Krähenbühl, N., Lisonbee, R. J., Lenz, A. L. Characterizing Progressive Collapsing Foot Deformity: A Multi-Domain Statistical Shape Modeling Approach, Podium Presentation for the 8th *International Foot and Ankle Biomechanics Conference*, Bordeaux, France, April 2023.
11. Peterson, A. C., Kruger, K. M., **Lenz, A. L.**, Foot and Ankle Anatomical Coordinate System Definition. Poster Presentation for the *Orthopaedic Research Society*, Dallas, TX, February 2023.
12. Knutson, K., Peterson, A. C., Krähenbühl, N., Lisonbee, R. J., **Lenz, A. L.** Characterizing Progressive Collapsing Foot Deformity: A Multi-Domain Statistical Shape Modeling Approach, Podium Presentation for the *Orthopaedic Research Society*, Dallas, TX, February 2023.
13. Knutson, K., Krzak, J. J., Kruger, K. M., **Lenz, A. L.**, Statistical Shape Model of Post Lateral Column Lengthening Adult Cerebral Palsy Flatfoot, Poster Presentation for *Orthopaedic Research Society*, Dallas, TX, February 2023.
14. Knutson, K., Leonard, T., Aragon, K. C., Muhlrud, E. P., Anderson, A. M., Eatough, Z. J., MacWilliams, B. A., Kruger, K. M., **Lenz, A. L.** Talar and Calcaneal Coordinate Axes Definitions Across Foot Pathologies, Poster Presentation for the *Orthopaedic Research Society*, Dallas, TX, February 2023.
15. Perez, K. N., Lisonbee, R. J., Knutson, K., **Lenz, A. L.** A Cadaveric Validation for Weightbearing CT Imaging Techniques for Improved Foot and Ankle Image Analysis and Diagnostics, Poster Presentation for the *Orthopaedic Research Society*, Dallas, TX, February 2023.
16. Schmeichel, S., Knutson, K., Peterson, A. C., Lisonbee, R. J., **Lenz, A. L.**, Barg, A., Hintermann, B., Krähenbühl, N. Assessment of Peritalar Joint Subluxation in Flatfoot Deformity. Poster Presentation for the *82nd Annual Swiss Orthopaedics Congress*, June 2022.

17. Perez, K. N., Lisonbee, R. J., Knutson, K., **Lenz, A. L.** Comparison of High-Resolution Biplane Fluoroscopy Model-Based Tracking Kinematics for Conventional CT versus Weightbearing CT Imaging Techniques: A Cadaveric Evaluation, Poster for the *Rocky Mountain ASB Regional Meeting*, Estes Park, CO, April 2022.
18. Eatough, Z.J., Lisonbee, R. J., Krähenbühl, N., Anderson, A.E, Saltzman, C.L, **Lenz, A. L.** Peritalar Compensation of the Subtalar Joint in Patients with Ankle Osteoarthritis: Hindfoot Alignment, Coverage, and Morphology Assessment, Poster for the *Rocky Mountain ASB Regional Meeting*, Estes Park, CO, April 2022.
19. Le, A. H., Henninger, H. B., Bachus, K. N., **Lenz, A. L.** Statistical Shape Modeling of the Tibia to Inform Mounting Position in a BioRobotic Foot and Ankle Simulator, Poster for the *Rocky Mountain ASB Regional Meeting*, Estes Park, CO, April 2022.
20. Knutson, K., Peterson, A. C., Krähenbühl, N., Lisonbee, R. J., **Lenz, A. L.**, Coverage Analysis of the Subtalar and Talonavicular Joints in Progressive Collapsing Foot Deformity. Poster for the *Rocky Mountain ASB Regional Meeting*, Estes Park, CO, April 2022.
21. Lisonbee, R. J., Peterson, A. C., Saltzman, C. L., Anderson, A. E., **Lenz, A. L.** Methodology for Comparing Dynamic Joint Space Measurements and Morphometric Shape Following Tibiotalar Arthrodesis and Total Ankle Replacement, In review for the *Rocky Mountain ASB Regional Meeting*, Estes Park, CO, April 2022.
22. Campbell ML, **Lenz AL**, Peterson AC, DeKeyser GJ, Haller JM, O'Neill DC. Dual approach to talar body fractures increases talar dome access for fracture care without osteotomy, In review for the *Orthopaedic Trauma Association*, Tampa, FL, October 2022.
23. Campbell ML, **Lenz AL**, Peterson AC, DeKeyser GJ, Haller JM, O'Neill DC. Dual approach to talar body fractures increases talar dome access for fracture care without osteotomy, In review for the *American Orthopaedic Foot and Ankle Society*, Quebec City, Quebec, Canada, September 2022.
24. Eatough, Z. J., Lisonbee, R. J., Krähenbühl, N., Anderson, A. E., Saltzman, C. L., **Lenz, A. L.** Peritalar Compensation of the Subtalar Joint in Patients with Ankle Osteoarthritis: Hindfoot Alignment, Coverage, and Morphology Assessment, Poster Presentation for the *Orthopaedic Research Society*, Tampa, FL, February 2022.
25. Lisonbee, R. J., Peterson, A. C., Saltzman, C. L., Anderson, A. E., **Lenz, A. L.** Evaluation of Dynamic Subtalar Joint Articulation and Morphometric Shape Following Tibiotalar Arthrodesis and Total Ankle Replacement, Podium Presentation for the *Orthopaedic Research Society*, Tampa, FL, February 2022.
26. Knutson, K., Peterson, A. C., Krähenbühl, N., Lisonbee, R. J., Barg, A., Saltzman, C. L., **Lenz, A. L.** Joint Coverage Analysis of the Subtalar and Talonavicular Joints in Progressive Collapsing Foot Deformity, Podium Presentation for the *Orthopaedic Research Society*, Tampa, FL, February 2022.
27. Elicegui, S. M., Rogers, T. J., Requist, M. R., Lisonbee, R. J., Krähenbühl, N., Haapasalo, H., Barg, A., **Lenz, A. L.** Evaluation of Lisfranc Injuries Using 3D Clinical Diagnostic Measurements, Poster Presentation for the *Orthopaedic Research Society*, Tampa, FL, February 2022.
28. Requist, M. R., Sripanich, Y., Rolvein, T., Barg, A., **Lenz, A. L.** Morphologic Analysis of the 1st and 2nd Tarsometatarsal Joint Articular Surfaces, Poster Presentation for the *Orthopaedic Research Society*, Tampa, FL, February 2022.

29. Peterson, A. C., Lisonbee, R. J., Krähenbühl, N., Saltzman, C. L., Anderson, A. E., Barg, A., Elhabian, S., **Lenz, A. L.** Multi-Domain Statistical Shape Model of the Subtalar, Talonavicular and Calcaneocuboid Joints, Poster Presentation for the *Orthopaedic Research Society*, Tampa, FL, February 2022.
30. Anderson, A. M., Muhlrad, E. P., Aragon, K. C., Leonard, T., Knutson, K., Krzak, J. J., MacWilliams, B. A., **Lenz, A. L.**, Kruger, K. M. Comparison of Talar and Calcaneal Coordinate Axes Definitions Across Foot Pathologies, Poster Presentation for the *Orthopaedic Research Society*, Tampa, FL, February 2022.
31. Muhlrad, E. P., Anderson, A. M., Aragon, K. C., Lisonbee, R. J., Kruger, K. M., **Lenz, A. L.** Analysis of Various Tibial Long Axis Coordinate System Definitions, Poster Presentation for the *Orthopaedic Research Society*, Tampa, FL, February 2022.
32. DeKeyser, G. J., O'Neill, D. C., Sripanich, Y., **Lenz, A. L.**, Haller, J. M., Barg, A. Posterior Talar Dome Accessibility: Comparing Posteromedial Approaches, Accepted for the *Orthopaedic Trauma Association*, Forth Worth, TX, October 2021.
33. **Lenz, A. L.**, Lisonbee, R. J., Peterson, A. C., Roach, K. E., Foreman, K. B., Barg, A., Anderson, A. E. Total Ankle Replacement In-Vivo Kinematics: A Biplane Fluoroscopy Imaging Study, Accepted for the *American Society of Biomechanics*, Virtual, August 2021.
34. **Lenz, A. L.**, Strobel, M. A., Anderson, A. M., Fial, A. V., MacWilliams, B. A., Krzak, J. J., Kruger, K. M. Assignment of Local Coordinate Systems during In-Vivo Kinematic Analysis of the Foot: A Systematic Review of the Literature, Poster Presentation for the *International Foot and Ankle Biomechanics Society*, Virtual, April 2021.
35. Requist, M. R., Sripanich, Y., Peterson, A. C., Rolvien, T., Barg, A., **Lenz, A. L.** Semi-Automatic Micro-CT Segmentation of the Cuneiforms Using Calibrated Thresholds, Poster Presentation for the *Orthopaedic Research Society*, Virtual, February 2021.
36. Requist, M. R., Sripanich, Y., Rolvien, T., Barg, A., **Lenz, A. L.** Micro-CT Analysis of Bone Mineral Density in the Lisfranc Complex, Poster Presentation for the *Orthopaedic Research Society*, Virtual, February 2021.
37. Lisonbee, R. J., Peterson, A. C., Saltzman, C. L., Anderson, A. E., **Lenz, A. L.** Dynamic Subtalar Joint Congruence Analysis Following Tibiotalar Arthrodesis and Total Ankle Replacement, Podium Presentation for the *Orthopaedic Research Society*, Virtual, February 2021.
38. Peterson, A. C., Krähenbühl, N., Lisonbee, R. J., Saltzman, C. L., Anderson, A. E., Barg, A., **Lenz, A. L.** Joint Coverage, Distance and Congruency Analysis of the Talonavicular and Calcaneocuboid Joints, Poster Presentation for the *Orthopaedic Research Society*, Virtual, February 2021.
39. **Lenz, A. L.**, Strobel, M. A., Anderson, A. M., Fial, A. V., MacWilliams, B. A., Krzak, J. J., Kruger, K. M. Systematic Review of Methods to Calculate Tibiotalar and Subtalar Kinematics, Poster Presentation for the *Orthopaedic Research Society*, Virtual, February 2021.
40. Requist, M. R., Sripanich, Y., Rolvien, T., Barg, A., **Lenz, A. L.** Micro-CT Analysis of Bone Mineral Density in the Lisfranc Complex, Poster Presentation for the *American Physician Scientists Association Western Regional Meeting*, Virtual, December 2020. **Won Best Basic Science Poster**
41. DeKeyser, G., O'Neil, D., Sripanich, Y., **Lenz, A. L.**, Haller, J., Saltzman, C., Barg, A. Avoiding the Osteotomy: Mapping of Posterior Talar Dome Access Through Posteromedial versus Posterolateral Approaches (A

cadaveric study), Presentation at the *Orthopaedic Trauma Association Annual Meeting*, Virtual, October 2020.

42. DeKeyser, G., O'Neil, D., Sripanich, Y., **Lenz, A. L.**, Haller, J., Saltzman, C., Barg, A. Mapping of Posterior Talar Dome Access Through Standard Posteromedial and Posterolateral Approaches With or Without External Fixator Distraction: A Match-paired Cadaveric Study, Presentation at the *American Orthopaedic Foot & Ankle Society Annual Meeting*, Virtual, September 2020.
43. **Lenz, A. L.**, Krähenbühl, N., Peterson, A. C., Lisonbee, R. J., Hintermann, B., Saltzman, C. L., Barg, A., Anderson, A. E. Talocrural Morphology: A Statistical Shape Modeling Multi-Articulation Joint Approach, Podium Presentation for the *American Society of Biomechanics*, Virtual, August 2020.
44. Lewis, C. A., Uemura, K., Atkins, P. R., **Lenz, A. L.**, Fiorentino, N. M., Aoki, S. K., Anderson, A. E. Bone-to-Bone Distance Changes Are Larger in Patients with Cam Femoroacetabular Impingement Syndrome, Podium Presentation for the *American Society of Biomechanics*, Virtual, August 2020.
45. Peterson, A. C., Lisonbee, R. J., Krähenbühl, N., Barg, A., Hintermann, B., Saltzman, C. L., Anderson, A. E., **Lenz, A. L.** Joint Distance, Coverage and Congruency Analysis of the Tibiotalar Joint, Finalist for *SB³C Undergraduate Student Paper Competition*, Virtual, June 2020.
46. **Lenz, A. L.**, Nichols, J. A., Roach, K. E., Lisonbee, R. J., Foreman, K. B., Barg, A., Saltzman, C. L., Anderson, A. E. Contralateral Ankle Complex Kinematic Compensations After Unilateral Tibiotalar Arthrodesis, Podium Presentation for the *International Foot and Ankle Biomechanics Society*, Virtual, Postponed from April 2020 to April 2021.
47. **Lenz, A. L.**, Lisonbee, R. J., Peterson, A. C., Barg, A., Roach, K. E., Foreman, K. B., Anderson, A. E. Total Ankle Replacement In-vivo Kinematics during Walking: A Dual Fluoroscopy Study, Poster Presentation for the *Orthopaedic Research Society*, Phoenix, AZ, February 2020.
48. Lisonbee, R. J., Krähenbühl, N., Barg, A., Hinterman, B., Saltzman, C. L., Anderson, A. E., **Lenz, A. L.** Joint Congruency and Distance Analysis of the Subtalar Joint During Weight-bearing, Podium Presentation for the *Orthopaedic Research Society*, Phoenix, AZ, February 2020.
49. **Lenz, A. L.**, Blair, D., Barg, A., Saltzman, C. L., Foreman, K. B., Anderson, A. E. Measurement of In-Vivo Tibiotalar Kinematics After Total Ankle Replacement Using Dual Fluoroscopy, Poster presentation for the *International Society of Biomechanics/American Society of Biomechanics*, Calgary, AB, Canada, August 2019.
50. Howell, K., Krähenbühl, N., Lisonbee, R., Hinterman, B., Saltzman, C. L., Anderson, A. E., Barg, A., **Lenz, A. L.** The Influence of Radiographic Projection Angle on Visualization of the Subtalar Joint, Finalist for *SB³C Undergraduate Student Paper Competition*, Seven Springs, PA, June 2019. (**1st place award winner**)
51. **Lenz, A. L.**, Nichols, J. A., Roach, K. E., Barg, A., Saltzman, C. L., Foreman, K. B., Anderson, A. E. In Vivo Subtalar Kinematics Following Tibiotalar Arthrodesis During Stair Tasks and Walking: A Dual-Fluoroscopy Study, Podium presentation for *Gait and Clinical Movement Analysis Society*, Frisco, TX, March 2019.
52. **Lenz, A. L.**, Krähenbühl, N., Atkins, P. R., Barg, A., Hintermann, B., Saltzman, C. L., Anderson, A. E. Morphologic Analysis of the Bones of the Ankle Joint Complex Using Statistical Shape Modeling, Podium for *Orthopaedic Research Society*, Austin, TX, February 2019. (**New Investigator Recognition Award Finalist**)

53. *Burssens, A., *Krähenbühl, N., **Lenz, A. L.**, Davidson, N., Vermue, H., Howell, K., Anderson, A. E., Saltzman, C. L., Barg, A. Assessment of Load and Torque Applied on Syndesmotric Ankle Injuries Using a Weightbearing CT and Computed Three-Dimensional Imaging Techniques, Poster Presentation for *Orthopaedic Research Society*, Austin, TX, February 2019.
54. **Lenz, A.**, Roach, K., Nichols, J., Barg, A., Saltzman, C., Foreman, K. B., Anderson, A. Subtalar Kinematics After Tibiotalar Arthrodesis, Thematic poster presentation at *American Society of Biomechanics*, Rochester, MN, August 2018.
55. Alderink, G., Hickox, L., Hoogenboom, B., **Lenz, A.**, Spitzley, T., Barger, W., Gailey, R. Comparison of Four Methods to Estimate Hip Joint Center on Normal Adult Individuals in the Context of Gait Analysis, Poster presentation at *Gait and Clinical Movement Analysis Society*, Indianapolis, IN, May 2018.
56. **Lenz, A.**, Johnson, K. Within Day Changes in Residual Limb Displacements Relative to a Prosthetic Socket for Transtibial Amputees, Podium presentation at *American Academy of Orthotics and Prosthetists*, New Orleans, LA, February 2018.
57. **Lenz, A.**, Roccabianca, S., Bush, T. R. Finite Element Analysis of Socket to Limb Interface Simulating Gel Liner Slip versus No Slip, Poster presentation at *American Society of Biomechanics*, Boulder, CO, August 2017.
58. **Lenz, A.**, Johnson, K., Bush, T. R. Displacements and Strains of the Gel Liner for Below Knee Prosthetic Users, Podium presentation at *American Society of Biomechanics*, Boulder, CO, August 2017.
59. Case, A., Barr, M., **Lenz, A.** Torsional Malalignment Syndrome and the Maximum Internal Varus Knee Moment during Gait in Individuals with Disabilities, Poster presentation at *American Society of Biomechanics*, Boulder, CO, August 2017.
60. Krauss, R., **Lenz, A.**, Ali, A. Teaching Dynamic Systems and Control without Dynamics, Podium presentation at *American Society for Engineering Education Conference*, Columbus, OH, June 2017.
61. **Lenz, A.**, Johnson, K., Bush, T. R. Motion in the Socket between Vacuum and Pin Suspension: A Case Study, Poster presentation at *American Academy of Orthotics and Prosthetists*, Chicago, IL, March 2017.
62. **Lenz, A. L.**, Johnson, K. A., Bush, T. R. An Empirical Method to Quantify Residual Limb Motion Relative to a Prosthetic Socket for Below Knee Amputees, Poster presentation at *American Society of Biomechanics*, Raleigh, NC, August 2016.
63. Alderink, G., Hoogenboom, B., **Lenz, A.**, Keniston, N., Krikke, A., Wiersma, B. Predictions of Hip Joint Center Location Using David and Seidel Methods: Effect on Hip Moments During Gait of Normal Healthy Adults, Poster presentation at *Gait and Clinical Movement Analysis Society*, Memphis, TN, May 2016.
64. Pan, W., Drost, J., **Lenz, A.**, Baek, S., Reid Bush, T. Modeling Reperfusion Responses in Patients with Leg Wounds, Poster presentation at *American Society of Biomechanics Conference*, Columbus, OH, August 2015.
65. **Lenz, A. L.**, Johnson, K. A., Reid Bush, T. Experimental Method to Quantify Residual Limb Displacement within a Prosthetic Socket, Poster presentation at *Michigan State Graduate Research Symposium*, East Lansing, MI, April 2015.

66. **Lenz, A. L.**, Barr, K. M. Influence of Various AFO Types on Recurvatum Gait: A Retrospective Review Using Computerized Gait Analysis, Podium presentation at *Gait and Clinical Movement Analysis Society*, Portland, OR, March 2015.
67. **Lenz, A. L.**, Johnson, K. A. Development of a Novel Experiment to Assess Residual Limb Motion Beneath Prosthetic Socket, Podium presentation at *American Academy of Orthotists and Prosthetists*, New Orleans, LA, February 2015.
68. **Lenz, A. L.**, Johnson, K. A., Reid Bush, T. Development of Empirical Method to Assess Residual Limb Motion beneath Prosthetic Socket, Poster presentation at *World Congress of Biomechanics*, Boston, MA, July 2014.
69. Barr, K. M., **Lenz, A. L.**, Dull, A., Holtz, K., Matousek, S. Prevalence and Impact of Different AFO Types on Crouch Gait: A Retrospective Review Using Computerized Gait Analysis, Podium presentation at *American Academy for Cerebral Palsy and Developmental Medicine*, San Diego, CA, September 2014.
70. **Lenz, A. L.**, Higginson, J. S. Lower Extremity Coordination Patterns in Post-Stroke Gait Based on Self-Selected Walking Speed Classification, Podium presentation at *Gait and Clinical Movement Analysis Society Conference*, Cincinnati, OH, May 2013.
71. Barr, K. M., **Lenz, A. L.** Use of Computerized Gait Analysis for Assessment and Optimization of FES Device: A Case Study, Podium presentation at *Gait and Clinical Movement Analysis Society Conference*, Cincinnati, OH, May 2013.
72. **Lenz, A. L.**, Higginson, J. S. Plantarflexor Muscles in Post-Stroke Gait Increase Activation Symmetry with Speed in Musculoskeletal Modeling, Poster presentation at *Gait and Clinical Movement Analysis Society Conference*, Grand Rapids, MI, May 2012.
73. Higginson, C. I., **Lenz, A. L.**, Higginson, J. S. The Impact of Walking on Thinking: Preliminary Results from a Dual Task Walking Study, Podium presentation at *International Neuropsychological Society Conference*, Montréal, Québec, Canada, February 2012.
74. **Lenz, A. L.**, Higginson, C. I., Higginson, J. S. Altered Walking Performance During Simultaneous Cognitive Tasks, Poster presentation at *American Society of Biomechanics Conference*, Long Beach, CA, August, 2011.
75. Lenhart, R. L., Francis, C. A., **Lenz, A. L.**, Thelen, D. G. Empirical Evaluation of Soleus and Gastrocnemius Function During Walking: Implications for Equinus Gait, Podium presentation at *American Society of Biomechanics Conference*, Long Beach, CA, August 2011.
76. **Lenz, A. L.**, Higginson, C. I., Higginson, J. S. Altered Walking Performance During Simultaneous Cognitive Tasks, Poster presentation at *Center for Biomedical Engineering Research Symposium*, Newark, DE, May 2011.
77. **Lenz, A. L.**, Hernández, A., Thelen, D. G. Empirical Assessment of Dynamic Hamstring Function During the Stance Phase of Gait, Podium presentation at *Gait & Clinical Movement Analysis Society Conference*, Bethesda, MD, April 2011.
78. Francis, C. A., **Lenz, A. L.**, Thelen, D. G. Modulation of Forward Propulsion, Support and Center of Pressure via Gastrocnemius Stimulation During Gait, Podium presentation at *Gait & Clinical Movement Analysis Society Conference*, Bethesda, MD, April 2011.

79. Hernández, A., **Lenz, A. L.**, Thelen, D. G. Influence of Hamstring Muscle Activity on Pelvic and Lower Extremity Motion During Walking, Poster presentation at *University of Wisconsin School of Medicine and Public Health Summer Research Forum*, Madison, WI, January 2011.
80. Hernández, A., **Lenz, A. L.**, Thelen, D. G. Electrical Stimulation Of The Semitendinosus During Terminal Swing Increases Knee Flexion Excursion During Early Stance, Poster presentation at *American Society of Biomechanics Conference*, State College, PA, August 2009.
81. **Lenz, A. L.**, Thelen, D. G. Walking Slower As We Age: Changes in Neuromuscular Coordination, Poster presentation at *University of Wisconsin-Madison Institute on Aging Colloquium*, Madison, WI, October 2009.
82. Hernández, A., **Lenz, A. L.**, Thelen, D. G. Improving the Understanding and Treatment of Walking Deficits Following Stroke, Poster presentation at *University of Wisconsin-Madison Institute on Aging Colloquium*, Madison, WI, October 2008.

Research Support:

Ongoing

1 K01 AR080221-01

07/01/2022 – 06/30/2027

NIH/NIAMS

Role: PI

(co-I = Andrew Anderson, Charles Saltzman, Megan Mills, Shireen Elhabian, Ross Whitaker, William Ledoux)

Classification of Ankle Osteoarthritis Severity from Weightbearing Computed Tomography Using Statistical Shape Modeling and Machine Learning

Goals: A 3D computational study to characterize ankle joint complex osteoarthritis by quantifying anatomical shape variation through Statistical Shape Modeling of the tibiotalar and subtalar joints.

R01 AR082952-01

09/15/2023 – 06/30/2028

NIH NIAMS

Role: co-I

(PI = Andrew Anderson, co-I = Shireen Elhabian, co-I = Charles Saltzman)

Pre and Post-Operative Evaluation of Ankle Arthrodesis

Goals: Evaluate patients before and after tibiotalar arthrodesis to determine outcomes based on their pre-operative alignment, morphology, and function of the ankle.

LS-Peery Foundation Grant

11/01/2022 – 10/31/2024

Role: PI

Robotic Simulator for Replicating Foot and Ankle Kinematics and Kinetics to Evaluate Post-Surgical Compensations

Goals: Created an adaptable high-speed robotic joint simulator to evaluate the effects of surgical interventions surgery on hindfoot kinematic compensations.

UOC Pediatric Orthopaedic Research Grant Program

11/20/2023 – 11/19/2024

Role: PI

Characterization of Foot Morphology in Genetic Subtypes of Charcot Marie Tooth Disease

Goals: Evaluate using 3D statistical shape modeling the influence of morphology on various genetic subtypes of Charcot Marie Tooth. Using weightbearing computed tomography, patient specific 3D models are generated and computational studies are conducted to quantify shape differences.

90ARHF0006-01-00 (\$750,000)

09/01/2020 – 08/30/2025

U.S. Department of Health and Human Services

National Institute of Disability, Independent Living, and Rehabilitation Research (NIDILRR)

Role: Mentor (PI = Gerald F. Harris)

Advanced Rehabilitation Research Training in Pediatric Mobility for Physicians and Engineers

T32 DK11096601 (\$\$56,484)

02/01/2024 – 01/31/2025

Role: Mentor (Post-doc trainee = Jenna Burnett, PIs = Drs Eilbeck or Pezzolesi)

NIH/NIDDK

University of Utah Interdisciplinary T32 Training Program in Computational Approaches to Diabetes and Metabolism Research

Recently Completed

Shriners Hospitals for Children (\$683,349 direct; \$263,481 for Utah site)

01/01/2020 – 12/31/2023

Role: co-PI/Site Lead

0.5 Calendar

(PI = Karen Kruger, PhD)

Amy L. Lenz, PhD: CV

Multisite Study of Hindfoot Kinematics Following Surgical Correction of Planovalgus

Goals: Develop a standardized protocol for assessment of tibiotalar and subtalar kinematics using biplane fluoroscopy and to assess the long-term effectiveness of surgical correction for pes planovalgus deformity.

UOC Pediatric Orthopaedic Research Grant Program (\$80,000)

01/01/2022 – 12/31/2023

Role: PI

0.0 Calendar

Characterization of Foot and Ankle Morphology in Pediatric Patients with Cerebral Palsy

Goals: Develop computational methods and statistical shape models to evaluate the 3D shape of the foot and ankle morphology in pediatric patients with cerebral palsy.

School of Medicine Research Incentive Seed Grant (\$50,000)

04/01/2022 – 03/31/2023

Role: PI (Co-I = Tim Beals)

0.0 Calendar

Evaluation of 3D Morphology in Patients with Charcot-Marie-Tooth For Improved Surgical Planning

Goals: Develop statistical shape models to quantify talar morphology and assess talar neck cam lesions in patients with Charcot-Marie-Tooth for surgical treatment planning.

Paragon 28 Inc. (\$69,870.60)

03/01/2022 – 03/31/2023

Role: PI

0.5 Calendar

Subtalar Joint Range of Motion Robotic Cadaver Testing

Goals: Develop proof of concept methods to determine greatest range of motion (ROM) of the subtalar joint (STJ) in a variety of different loaded and unloaded configurations using robotic manipulation.

Stryker/ORS Women's Research Fellowship (\$50,000)

04/01/2019 – 3/31/2020

Role: PI (Sponsor = Andrew E. Anderson, PhD)

Advancing Total Ankle Replacement Through Morphometric and Kinematic Analyses

Goals: Utilize statistical shape modeling to compute healthy variation in tibiotalar morphometrics and quantify tibiotalar and subtalar kinematics following total ankle replacement using dual-fluoroscopy.