ANTHONY H LE

Salt Lake City, UT | anthony.le@utah.edu | LinkedIn | Website | GitHub

EDUCATION

PhD in Biomedical Engineering **Expected Aug 2025**
University of Utah *Salt Lake City, UT, USA*

- Proposed Dissertation: "Characterizing Ankle and Hindfoot Biomechanics Using Robotic Cadaveric Simulation"
  - Committee Chair: Dr. Amy L. Lenz
  - Committee Members: Drs. Heath B. Henninger, Jeffrey A. Weiss, Robert W. Hitchcock, Alan Kuntz
- Relevant Coursework: Medical Robotics, Motion Planning, Functional Anatomy for Engineers, Biomechanics, Computational Biomechanics, Biomaterials, Biomechanics of Human Movement, Proposal Writing & Presentation

Graduate Certificate in Deep Learning in AI & Robotics **Expected May 2025**
University of Utah *Salt Lake City, UT, USA*

- Relevant Coursework: Applied Data Visualization, Machine Learning, Medical Robotics, Deep Learning, Deep Learning Industry Capstone

MS in Bioengineering, Minor in Robotics **Dec 2020**
Oregon State University *Corvallis, OR, USA*

- Thesis: "Biomechanical Modeling of Isometric Muscle-Tendon Force Generation Through Tendons Coupled in Parallel and a Passive Differential Mechanism"
  - Co-Advisors: Drs. Ravi Balasubramanian and James D. Sweeney
  - Committee Members: Drs. William D. Smart, Adam Z. Higgins, David P. Cann
- Relevant Coursework: Drug & Medical Device Regulations in Technology Development, Physiology for Engineers, Biomechanics of Musculoskeletal Injury, Motor Control & Movement Dysfunction, Sequential Decision Making in Robotics, Human Control Systems, Applied Robotics, Nonlinear Dynamic Analysis, Numerical Linear Algebra, Numerical Methods, Data Science for Engineers

BS in Chemistry, Minor in Applied Mathematics **May 2015**
Wofford College *Spartanburg, SC, USA*

- Relevant Coursework: Human Physiology, Pathology & Histology, Biochemistry, Advanced Organic Chemistry, Physical Chemistry, Organic Chemistry, Cellular Biology, Genetics & Molecular Biology, Linear Algebra, Differential Equations, Mathematical Proofs, Multivariable Calculus, Statistics, Physics, Programming & Problem-Solving

EXPERIENCES

Graduate Research Assistant **Jan 2022–Present**
Orthopaedic Research Laboratory, University of Utah Health *Salt Lake City, UT, USA*

- Led a product development collaboration with an orthopaedic medical device company, designing experiments, conducting preclinical testing, and analyzing data to evaluate device functionality and support FDA compliance
- Procured and preprocessed multi-modal biomechanical datasets to train machine learning models for predictive analytics in musculoskeletal function during gait using Python, PyTorch, and OpenSim
- Designed deep learning models (CNNs, RNNs, LSTMs, transformers) to predict time-series muscle forces from ground reaction forces during gait using Python and PyTorch, achieving 92% prediction accuracy with the best model
- Integrated a robotic system with electro-mechanical linear actuators, force sensors, motion capture, and an industrial robot to simulate motions in cadaveric lower limbs, enabling multi-modal data collections for preclinical foot & ankle biomechanics research
- Developed data-driven control algorithms for a robotic system to replicate gait in cadaveric lower limbs using Python and LabVIEW, optimizing robotic cadaveric simulation accuracy and flexibility
- Applied advanced statistical techniques to analyze time-series biomechanical data, identifying critical patterns and trends to guide clinical decision-making and surgical planning for orthopedic foot & ankle surgeries using Python, MATLAB, and R
- Collaborated with orthopaedic surgeons to translate research findings into actionable insights that support clinical decision-making and surgical planning for improving patient outcomes
- Mentored students in experimental design, software development, and data analysis, contributing to collaborative research projects
- Certified in good clinical practices (GCP), human subjects research, and biomedical research ethics to ensure ethical standards and regulatory compliance in clinical and biomedical research
- Co-authored 3+ publications in high-impact journals related to biomechanics, biomedical engineering, and robotics/machine learning

Research Analyst **Oct–Dec 2021**
Orthopaedic Research Laboratory, University of Utah Health *Salt Lake City, UT, USA*

- Conducted literature reviews on hindfoot biomechanics, ankle fusion, joint replacement implants, and robotic cadaveric simulations to identify research gaps and inform future studies
- Designed and prototyped radiopaque bone pins for attaching marker clusters to bones and fixture systems for attaching cadaveric specimens to industrial robots using SolidWorks, 3D printing, and CNC machining
- Developed data processing pipelines to calculate 3D joint kinematics from motion capture data for biomechanical analysis while ensuring data integrity using Python and MATLAB

- Applied statistical parametric mapping (SPM) to analyze complex biomechanical datasets, identifying significant spatial-temporal patterns in musculoskeletal function and foot & ankle joint kinematics
- Leveraged SPM to effectively interpret time-series biomechanical data, enabling insights into the variability and effects of surgical interventions
- Analyzed population variability in tibial morphology using statistical shape modeling and medical image analysis of 100+ CT scans

Musculoskeletal Biomechanics Research Fellow **Mar 2020–Sept 2021**
Walter Reed National Military Medical Center *Bethesda, MD, USA*

- Designed custom fixtures and experimental setups for biomechanical cadaveric testing of orthopaedic interventions across six anatomical models (tendons, elbow, knee, spine, shoulder, and foot & ankle) using SolidWorks, 3D printing, and CNC machining
- Established data collection pipelines with force sensors, motion capture, and material testing to streamline biomechanical data analysis using Python and MATLAB
- Processed and analyzed large biomechanical datasets from cadaveric experiments to validate hypotheses on the effects of surgical interventions on musculoskeletal function using Python and MATLAB
- Applied advanced statistical techniques to quantify variability and identify key biomechanical factors impacting clinical outcomes of surgical interventions using Python and R
- Visualized complex biomechanical data from experiments to communicate key findings to orthopedic surgeons, providing data-driven recommendations to optimize surgical treatment strategies
- Observed orthopedic procedures, expanding knowledge of surgical environments, medical devices, and clinical applications
- Collaborated with orthopaedic surgeons and engineers to design experiments for evaluating medical device functionalities, addressing clinical needs, and supporting FDA regulatory compliance
- Co-authored 12+ publications in high-impact journals related to orthopaedics, arthroscopy, trauma, and sports medicine

Graduate Research Assistant **Sept 2016–Feb 2020**
Robotics & Human Control Systems Laboratory, Oregon State University *Corvallis, OR, USA*

- Developed data-driven biomechanical models for simulating muscle forces and joint torques in tendon transfer surgeries using MATLAB
- Formulated IACUC-approved protocols for validating implant designs in preclinical animal models
- Established a design of experiment to measure isometric muscle force, joint torques, and joint kinematics using intramuscular functional electrical stimulation (FES), force sensors, and motion capture in preclinical animal models
- Fabricated custom fixtures to interface force sensors with the chicken foot anatomy to measure multiple toe tip forces simultaneously during intramuscular FES using Solidworks and 3D printing
- Managed 2 research assistants in designing apparatuses and processing biomechanical data, facilitating efficient data analysis, model development, and hypothesis testing in MATLAB and R
- Co-authored 2+ publications in journals related to biomechanics and veterinary science

Undergraduate Research Assistant **Apr–Sept 2016**
Tomasino Laboratory, Oregon State University Food Science and Technology *Corvallis, OR, USA*

- Designed an experiment to quantify the composition of linalool and 1-octen-3-ol in green bean varietals using GS-MS
- Facilitated sensory studies with a cohort of participants to assess the perception of the aromatic characteristics and flavor profiles of different green bean varietals

Chemistry Research Intern **Jun–Nov 2015**
E. & J. Gallo Research Laboratory, E. & J. Gallo Winery *Modesto, CA, USA*

- Analyzed organic chemistry of grapes juice to predict resultant wine characteristics in production using high-throughput FT-IR and FT-NIR spectroscopy
- Isolated and purified polysaccharides from wines and grape pomace to evaluate value-added mouthfeel profiles for R&D projects related to the Dark Horse Wine brand using high-throughput HPLC
- Operated resin column in down-flow configuration to extract quercetin glycosides and other polyphenols from Muscat grape juice for white wine product development projects

TECHNICAL SKILLS

- **Programming Languages:** Python, MATLAB, R, LabVIEW, SQL
- **Data Analysis & Visualization:** Pandas, NumPy, Matplotlib, Seaborn, Plotly, ggplot2, Tableau, Power BI
- **Machine Learning & AI:**
  - **Supervised Learning:** K-Nearest Neighbors, SVM, Logistic/Linear Regression, Random Forest, Decision Trees, Naive Bayes, XGBoost
  - **Unsupervised Learning:** Clustering, PCA
  - **Deep Learning:** Neural Networks, CNNs, RNNs, LSTMs, GANs, Autoencoders, Transformers
  - **Frameworks:** PyTorch, TensorFlow/Keras, scikit-learn, statsmodels
- **Statistical Techniques:** Descriptive Statistics, Hypothesis Testing, Regression Analysis, Time-Series Analysis, Bayesian Inference, Statistical Parametric Mapping, Resampling Methods, Design of Experiments, Correlation
- **Development Tools:** VS Code, Jupyter Notebook, Anaconda, RStudio, Git, GitHub, Linux, OOP
- **Robotics:** ROS/ROS2, Gazebo, RViz, MoveIt2, RoboDK
- **3D Motion Capture:** OptiTrack, Optotrak Certus, Vicon

- **Musculoskeletal Modeling:** OpenSim, MATLAB
- **Finite Element Analysis:** FEBio
- **CAD Tools:** SolidWorks, Fusion 360
- **Certifications:** CITI GCP, CITI Human Subjects Research, CITI Biomedical Research Ethics, FANUC Basic Programming, MTS Configuration, MTS 793 Introduction
- **Functional Expertise:** Data Wrangling, Feature Engineering, Experimental Design, Scientific Communication, Technical Writing, Cross-Functional Collaboration, Project Management, Research & Development

ACADEMIC PROJECTS

Predicting Lower Limb Muscle Forces from Ground Reaction Forces During Gait Using Sequence and Attention-Based Deep Learning Models

- Implemented LSTM, CNN-LSTM, LSTM with Attention, and a Transformer model to capture the complex relationships and patterns between GRFs and lower limb muscle forces during gait, achieving 92% accuracy on test dataset with the best model
- Designed preprocessing pipelines for large-scale time-series data, applying normalization techniques and Bayesian optimization hyperparameter tuning to enhance model convergence and performance

Exploring Text Classification for Predicting Trial Outcomes in Old Bailey Proceedings

- Implemented machine learning algorithms (ID3, Perceptron, SVM, logistic regression, neural networks) to classify trial outcomes in Old Bailey proceedings using Python, NumPy, and Tensorflow/Keras, achieving 81% accuracy with the best model
- Applied feature engineering and dimensionality reduction (PCA) to optimize input representations, reducing model training time

Towards an Autonomous Surgical Retraction System via Uncertainty Quantification

- Analyzed uncertainty quantification methods (deep ensembles, Monte Carlo dropout) in surgical soft-tissue manipulation using PyTorch within the DeformerNet framework
- Found deep ensembles deliver more accurate uncertainty estimates, effectively distinguishing successful from unsuccessful actions through ensemble variance slopes

Mobile Air Quality Monitoring in the Salt Lake Valley

- Mapped geospatial air quality data and identified correlations with socioeconomic factors to highlight disparities in exposure, deploying an interactive visualization for public accessibility using Python, Geopandas, Matplotlib, Contextily, Folium, and Seaborn

Replicating In Vivo Tibial Motion with a 6-Axis Industrial Robotic Manipulator

- Replicated 3D tibial gait motion from biplane fluoroscopy motion capture data on a 3D-printed tibia mounted to a 6-axis robotic manipulator using Python, RoboDK, and ROS.

Finite Element Model of Biphasic Contact in the Tibiotalar Joint

- Developed FEA models of the ankle joint to compare cartilage contact mechanics in healthy and osteoarthritic conditions using FEBio

Stability Analysis of a Nonlinear Model Predictive Controller for Functional Electrical Stimulation

- Examined NMPC stability using Lyapunov Theory and tuned an PID controller for leg extension in a musculoskeletal model using MATLAB and OpenSim

Implementation and Examination of a Mathematical Model for Predicting Muscle Force and Fatigue

- Utilized the ode45 function to model isometric muscle forces using MATLAB
- Performed a sensitivity analysis on physiological parameters in muscle force and fatigue prediction using MATLAB

Implementation of Convolutions Neural Networks for Iceberg Classification in Satellite Radar Data

- Implemented a CNN to classify satellite image data as either a ship or iceberg, achieving 87% accuracy on the Kaggle evaluation dataset

Semi-Autonomous Mobile Robot for Jenga Game Play

- Developed a custom mobile robot with a 5-axis manipulator using 3D-printed parts, motors, sensors, Raspberry Pi, and microcontrollers
- Designed a control system in C++ for autonomous navigation using LIDAR data and user input for block picking and manipulation

Trajectory Optimization of Human Arm Reaching Model in OpenSim

- Implemented the iLQR algorithm to optimize object-reaching tasks for a sagittal-plane human arm model, improving trajectory planning and control using MATLAB and OpenSim

Safe Feedback Motion Planning with Unknown Dynamics for a Car Model in MATLAB

- Augmented stochastic trajectory optimization with LQR feedback control for mobile robot motion planning using MATLAB

PEER-REVIEWED JOURNAL PUBLICATIONS

1. **AH Le**, AC Peterson, JA Larrea Rodriguez, T Miyamoto, F Nickisch, AL Lenz. "Passive Ankle and Hindfoot Joint Kinematics Within a Robot-Driven Tibial Movement Envelope," *J Biomech, Submitted Sept 2024, In Review*
2. J Thompson, R Koe, **A Le**, G Goodman, DS Brown, A Kuntz. "Autonomous Surgical Soft-Tissue Manipulation with Uncer-

tainty Driven Requests for Human Intervention," *Conference on Robot Learning, Accepted Sept 2024*

3. JK Carver, **AH Le**, DF Colantonio, RM Putko, DL Rodkey, MB Bird, WB Roach, CJ Tucker, JF Dickens, BD Hendershot, MD Helgeson, TC Mauntel. "Alterations in Tibiofemoral Contact Pressures Following Anterior Cruciate Ligament and Meniscus Injuries and Surgical Interventions," *J Knee Surg, Submitted Mar 2024*
4. PK Mescher, TP Murphy, **AH Le**, DF Colantonio, D Rodkey, CH Renninger. "Fully Threaded Screws Provide Superior Fixation in Femoral Neck Fracture Fixation Compared to Partially Threaded Screws: A Biomechanical Study," *Injury, Submitted Mar 2023*
5. TP Murphy, JD Tran, DF Colantonio, **AH Le**, DR Fredericks, WB Roach, J Chung, AJ Pisano, SC Wagner, MD Helgeson. "Biomechanical Comparison of Anterior Cervical Plate Fixation Versus Integrated Fixation Cage for Anterior Cervical Discectomy and Fusion," *Clin Spine Surg, Published Apr 2024*
6. TP Murphy, DF Colantonio, **AH Le**, DR Fredericks, CD Schlaff, E Holm, AS Sebastian, AJ Pisano, MD Helgeson, SC Wagner. "Biomechanical Analysis of Multilevel Posterior Cervical Spinal Fusion Constructs," *Clin Spine Surg, Published Jun 2023*
7. DF Colantonio, **AH Le**, AJ Pisano, JM Chung, SC Wagner, DR Fredericks, WB Roach, CD Schlaff, A Dill, MD Helgeson. "Hooks Versus Pedicle Screws at the Upper Instrumented Level: An *In Vitro* Biomechanical Comparison," *Spine, Published Apr 2023*
8. DF Colantonio, RK Kicklighter, **AH Le**, MA Nowicki, MA Posner, LF Zhou, SM Gee. "Subcortical Backup Tibial Fixation in Anterior Cruciate Ligament Reconstruction has Similar Maximal Strength to Current Techniques," *Arthrosc Sports Med Rehabil, Published Feb 2023*
9. DF Colantonio, CJ Tucker, TP Murphy, PK Mescher, **AH Le**, RM Putko, ER Holm, R Weishar, TK Vippa, TN Rubic, ES Chang. "All-Suture Suspensory Button Has Similar Biomechanical Performance to Metal Suspensory Button for Onlay Subpectoral Biceps Tenodesis," *Arthrosc Sports Med Rehabil, Published Dec 2022*
10. A Lundy, DF Colantonio, **AH Le**, RC Lee, AS Piscoya, E Holm, TT Eckel. "Biomechanical Changes in the Ankle Joint after Syndesmosis and Deltoid Injury and Subsequent Repair in a Cadaveric Model," *Foot Ankle Orthop, Published Nov 2022*
11. ES Chang, **AH Le**, AM Looney, WB Roach, MD Helgeson, DM Clark, DR Fredericks, S Nagda. "Biomechanical Comparison of Anatomic Restoration of the Ulnar Footprint Versus Traditional Ulnar Tunnels in Ulnar Collateral Ligament Reconstruction," *Am J Sports Med, Published Apr 2022*
12. DF Colantonio, **AH Le**, LE Keeling, SE Slaven, T Vippa, MD Helgeson, ES Chang. "Intramedullary Unicortical Button and All-Suture Anchors Provide Similar Maximum Strength for Onlay Distal Biceps Tendon Repair," *Arthroscopy, Published Feb 2022*
13. **AH Le**, WB Roach, TC Mauntel, BD Hendershot, MD Helgeson, DF Colantonio, DR Fredericks, SE Slaven, AJ Pisano, LE LeClere. "A Biomechanical Comparison of High-Tensile Strength Tape Versus High-Tensile Strength Suture for Tendon Fixation Under Cyclic Loading," *Arthroscopy, Published Sept 2021 — **Arthroscopy Journal Award for Basic Science Research Excellence Runner-Up***
14. GR Browning, **AH Le**, JJ Warnock, R Balasubramanian. "An Investigation of a Novel Tendon Transfer Surgery for High Median-Ulnar Nerve Palsy in a Chicken Model," *J Invest Surg, Published Oct 2017*

CONFERENCE PRESENTATIONS

Oral Presentations

1. **AH Le**, AC Peterson, JA Larrea Rodriguez, T Miyamoto, F Nickisch, AL Lenz. "Passive Hindfoot Kinematics as a Function of Ankle and Forefoot Perturbations," *American Society of Biomechanics 2024 Meeting, Madison, WI, USA, Aug 2024*
2. **AH Le**, JA Larrea Rodriguez, AL Lenz. "Windlass Mechanism Engagement Influences Calcaneocuboid Joint Kinematics Within a Robotic-Driven Tibial Movement Envelope: A Preliminary Study," *XXIX Congress of International Society of Biomechanics, Fukuoka, JPN, Aug 2023 — **David Winter Young Investigator Award Finalist***
3. S Nelson, DF Colantonio, **AH Le**, R Lee, A Piscoya, E Holm, T Eckel. "Biomechanical Changes in the Ankle Joint After Syndesmosis and Deltoid Injury and Subsequent Repairs," *Arthroscopy Association of North America 2023 Annual Meeting, New Orleans, LA, USA, Jun 2023*
4. DF Colantonio, CJ Tucker, TP Murphy, PK Mescher, **AH Le**, RM Putko, E Holm, RC Weishar, TK Vippa, ES Chang. "Novel All-Suture Button Has Similar Biomechanical Performance to Metal Suspensory Button for Onlay Subpectoral Biceps Tenodesis," *64th Annual Meeting of the Society of Military Orthopaedic Surgeons, Scottsdale, AZ, USA, Dec 2022*
5. PK Mescher, TP Murphy, **AH Le**, DF Colantonio, D Rodkey, S Ghenbot, E Rich, CH Renninger. "Fully Threaded Screws Provide Superior Fixation in Femoral Neck Fracture Fixation Compared to Partially Threaded Screws: A Biomechanical Study," *64th Annual Meeting of the Society of Military Orthopaedic Surgeons, Scottsdale, AZ, USA, Dec 2022*
6. JL Carver, **AH Le**, DF Colantonio, WB Roach, CJ Tucker, JF Dickens, BD Hendershot, MD Helgeson, TC Mauntel. "Knee

Joint Peak Contact Pressure Location Following ACL and Meniscus Injuries and Surgical Treatments," *2022 Womack Army Medical Center Research Symposium, Fort Bragg, NC, USA, May 2022*

7. PK Mescher, TP Murphy, **AH Le**, DF Colantonio, D Rodkey, CH Renninger. "Biomechanical Evaluation of Fully Versus Partially Threaded Cannulated Screw Fixation of Transcervical Femoral Neck Fractures," *2022 Annual Meeting of the Orthopaedic Trauma Association, Tampa, FL, USA, Oct 2022*
8. AE Lundy, DF Colantonio, **AH Le**, R Lee, AS Piscoya, E Holm, TT Eckel. "Biomechanical Changes in the Ankle Joint After Syndesmosis and Deltoid Injury and Subsequent Repairs in a Cadaveric Model," *2022 Annual Meeting of the American Orthopaedic Foot and Ankle Society, Quebec City, QC, CA, Sept 2022*
9. AE Lundy, DF Colantonio, **AH Le**, R Lee, AS Piscoya, E Holm, TT Eckel. "Biomechanical Changes in the Ankle Joint After Syndesmosis and Deltoid Injury and Subsequent Repairs," *2022 Annual Meeting of the Arthroscopy Association of North America, San Francisco, CA, USA, May 2022*
10. PK Mescher, TP Murphy, **AH Le**, DF Colantonio, D Rodkey, CH Renninger. "Biomechanical Evaluation of Fully Versus Partially Threaded Cannulated Screw Fixation of Transcervical Femoral Neck Fractures," *75th Annual Meeting of the Virginia Orthopaedic Society, White Sulphur Sprrings, WV, USA, Apr 2022*
11. AE Lundy, DF Colantonio, **AH Le**, R Lee, AS Piscoya, E Holm, TT Eckel. "Biomechanical Changes in the Ankle Joint After Syndesmosis and Deltoid Injury and Subsequent Repairs," *2022 Annual Meeting of the American Orthopaedic Society for Sports Medicine, Chicago, IL, USA, Mar 2022*
12. ES Chang, **AH Le**, AM Looney, WB Roach, MD Helgeson, DM Clark, DR Fredericks, S Nagda. "Biomechanical Comparison of Anatomic Restoration of the Ulnar Footprint Versus Traditional Ulnar Tunnels in Ulnar Collateral Ligament Reconstruction," *2022 Annual Meeting of the American Orthopaedic Society for Sports Medicine/2022 Specialty Day, Chicago, IL, USA, Mar 2022*
13. AE Lundy, DF Colantonio, **AH Le**, R Lee, AS Piscoya, E Holm, TT Eckel. "Tibiotalar Contact Pressures and Torsional Stability following Syndesmosis and Deltoid Ligament Injury and Repair," *63rd Annual Meeting of the Society of Military Orthopaedic Surgeons, Olympic Valley, CA, USA, Dec 2021*
14. DF Colantonio, **AH Le**, DR Fredericks, JM Chung, A Dill, AJ Pisano, MD Helgeson, A Sebastian, SC Wagner, S Rabin. "Effects of Drill Technique and Burr Size on Insertional Torque and Pullout Strength of Lateral Mass Screw Fixation," *63rd Annual Meeting of the Society of Military Orthopaedic Surgeons, Olympic Valley, CA, USA, Dec 2021*
15. TP Murphy, DF Colantonio, **AH Le**, SC Wagner, DR Fredericks, WB Roach, JM Chung, AF Pisano, MD Helgeson. "Biomechanical Comparison of Anterior Plate Fixation vs. Integrated Fixation Cage for Anterior Cervical Discectomy and Fusion," *63rd Annual Meeting of the Society of Military Orthopaedic Surgeons, Olympic Valley, CA, USA, Dec 2021*
16. TP Murphy, DF Colantonio, **AH Le**, DR Fredericks, CD Schlaff, E Holm, MD Helgeson, SC Wagner. "Biomechanical Analysis of the Cervicothoracic Junction in Long Posterior Cervical Fusion Constructs," *63rd Annual Meeting of the Society of Military Orthopaedic Surgeons, Olympic Valley, CA, USA, Dec 2021*
17. RE Kinnison, DF Colantonio, **AH Le**, MA Posner, MA Nowicki, SM Gee, RM Putko. "Novel Intramedullary Suture Button Technique has Similar Maximal Strength to Bicortical Post for Secondary ACL Graft Fixation," *63rd Annual Meeting of the Society of Military Orthopaedic Surgeons, Olympic Valley, CA, USA, Dec 2021*
18. ES Chang, DF Colantonio, **AH Le**, AM Looney, WB Roach, DM Clark, DR Fredericks, MD Helgeson, S Nagda. "Biomechanical Comparison of Anatomic Restoration of the Ulnar Footprint vs. Traditional Ulnar Tunnels in Ulnar Collateral Ligament Reconstruction," *63rd Annual Meeting of the Society of Military Orthopaedic Surgeons, Olympic Valley, CA, USA, Dec 2021*
19. DF Colantonio, **AH Le**, AJ Pisano, SC Wagner, DR Fredericks, WB Roach, CD Schlaff, MD Helgeson. "Hooks vs. Pedicle Screws at Upper Level of Long Fusion Constructs," *63rd Annual Meeting of the Society of Military Orthopaedic Surgeons, Olympic Valley, CA, USA, Dec 2021*
20. DF Colantonio, **AH Le**, LE Keeling, SE Slaven, MD Helgeson, ES Chang, H Gibbs. "Biomechanical Comparison of Onlay Distal Biceps Repair: Intramedullary Button vs. All-Suture Anchors," *63rd Annual Meeting of the Society of Military Orthopaedic Surgeons, Olympic Valley, CA, USA, Dec 2021*
21. DF Colantonio, **AH Le**, WB Roach, JM Chung, DR Fredericks, AJ Pisano, SC Wagner, MD Helgeson. "Posterior Thoracic Spine Construct Stiffness Under Cyclic Load: An *In Vitro* Biomechanical Comparison of Hooks vs. Pedicle Screws," *14th Annual Meeting of the Lumbar Spine Research Society, Virtual, Apr 2021*
22. **AH Le**, WB Roach, TC Mauntel, BD Hendershot, MD Helgeson, AJ Pisano, LE LeClere. "An *In Vitro* Biomechanical Comparison of Suture Constructs for Acute Tendon Rupture Repairs Under Cyclic Loading," *62nd Annual Meeting of the Society of Military Orthopaedic Surgeons, Virtual, Dec 2020*
23. **AH Le**, J Casebier, J Mandich, JJ Warnock, JD Sweeney, R Balasubramanian. "Evaluation of Postoperative Healing for Novel Tendon Transfer Surgery Using an Implantable Passive Mechanism: A Pilot *In Vivo* Study," *44th Annual Veterinary Orthopedic Society Conference, Snowbird, UT, USA, Mar 2017*

Poster Presentations

1. JA Larrea Rodriguez, **AH Le**, AC Peterson, AL Lenz. "Effect of Fifth Metatarsal Perturbation on Hindfoot Vertical Ground Reaction Forces Within a Robot Driven Tibial Coronal Alignment Envelope," *Orthopaedic Research Society 2024 Annual Meeting, Long Beach, CA, USA, Feb 2024*
2. **AH Le**, AC Peterson, JA Larrea Rodriguez, T Miyamoto, F Nickisch, AL Lenz. "Passive Hindfoot Kinematics Within A Robot-Driven Tibial Sagittal Movement Envelope," *Orthopaedic Research Society 2024 Annual Meeting, Long Beach, CA, USA, Feb 2024*
3. **AH Le**, JA Larrea Rodriguez, AL Lenz. "Windlass Mechanism Engagement Influences Calcaneocuboid Joint Kinematics Within a Robotic-Driven Tibial Movement Envelope: A Preliminary Study," *13th Annual Meeting of the Rocky Mountain American Society of Biomechanics, Estes Park, CO, USA, April 2023 — **Best Doctoral Poster Presentation Award***
4. **AH Le**, RJ Lisonbee, JA Larrea Rodriguez, AL Lenz. "Effect of Windlass Mechanism Engagement on Hindfoot and Midfoot Kinematics Within a Robotic-Driven Tibial Movement Envelope: A Preliminary Study," *Orthopaedic Research Society 2023 Annual Meeting, Dallas, TX, USA, Feb 2023*
5. **AH Le**, HB Henninger, KN Bachus, AL Lenz. "Statistical Shape Modeling of the Tibia to Inform Mounting Position in a BioRobotic Foot and Ankle Simulator," *12th Annual Meeting of the Rocky Mountain American Society of Biomechanics, Estes Park, CO, USA, Apr 2022*
6. DF Colantonio, CJ Tucker, **AH Le**, PK Mescher, TP Murphy, RM Putko, E Holm, R Weishar, T Rubic, T Vippa, ES Chang. "Biomechanical Comparison of Novel All-Suture Button vs Metal Button for Subpectoral Biceps Tenodesis," *2022 Annual Meeting of the Arthroscopy Association of North America, San Francisco, CA, USA, May 2022*
7. TP Murphy, **AH Le**, DF Colantonio, DR Fredericks, JM Chung, WB Roach, AJ Pisano, MD Helgeson, SC Wagner. "Effects of Drill Technique and Burr Size on Insertional Torque and Pullout Strength of Lateral Mass Screw Fixation," *2022 Annual Meeting of the American Academy of Orthopaedic Surgeons, Chicago, IL, USA, Mar 2022*
8. TP Murphy, DF Colantonio, **AH Le**, DR Fredericks, CD Schlaff, E Holm, MD Helgeson, SC Wagner. "Biomechanical Analysis of the Cervicothoracic Junction in Long Posterior Cervical Fusion Constructs," *2022 Annual Meeting of the American Academy of Orthopaedic Surgeons, Chicago, IL, USA, Mar 2022*
9. **AH Le**, JD Sweeney, R Balasubramanian. "Changes in Tendon Network Configuration Influences Joint Moment-Angle Characteristics: Implications of Tendon Transfers," *1st Annual Oregon Bioengineering Symposium, Corvallis, OR, USA, Nov 2019*
10. **AH Le**, JJ Warnock, JD Sweeney, R Balasubramanian. "Clinical Assessment of Functional Recovery After a Novel Tendon Transfer Surgery in a Chicken Model," *2018 Military Health Systems Research Symposium, Kissimmee, FL, USA, Aug 2018*
11. **AH Le**, JD Sweeney, R Balasubramanian. "Biomechanical Analysis of Toe Extension After a Novel Tendon Transfer Surgery for Implantable Passive Mechanisms," *40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Honolulu, HI, USA, Jul 2018*
12. LM Cavalcani, H Ling, **AH Le**, R Balasubramanian, VJ Mathews. "Improving Muscle Activation Efficiency of Functional Neuromuscular Stimulation Using a Passive Force-Scaling Implant," *43rd Neural Interfaces Conference, Minneapolis, MN, USA, Jun 2018*
13. **AH Le**, DS Russell, JJ Warnock, MK Larson, GR Browning, KA Fischer, JD Sweeney, R Balasubramanian. "Histopathological Healing Responses to a Novel Tendon Transfer Surgery in a Chicken Model," *2017 Military Health Systems Research Symposium, Kissimmee, FL, USA, Aug 2017*
14. **AH Le**, GR Browning, JJ Warnock, JD Sweeney, R Balasubramanian. "Evaluation of Gait Quality for a Novel Tendon Transfer Surgery in a Chicken Model," *13th Annual Northwest Biomechanics Symposium, Eugene, OR, USA, May 2017*

Workshop Presentations

1. **AH Le**, DS Russell, MK Larson, JJ Warnock, GR Browning, KA Fischer, JD Sweeney, R Balasubramanian. "Histopathological Analysis of Healing Responses to a Novel Tendon Transfer Surgery in a Chicken Model," *47th International ORS Musculoskeletal Biology Workshop, Sun Valley, ID, USA, Aug 2017 — **Blue Ribbon Poster Award***

HONORS & AWARDS

- **David Winter Young Investigator Award Finalist**, *International Society of Biomechanics* **May 2023**
- **Best Doctoral Poster Presentation Award**, *Rocky Mountain American Society of Biomechanics* **Apr 2023**
- **Arthroscopy Journal Award for Basic Science Research Excellence Runner-Up**, *Arthroscopy* **Jan 2022**
- **Dean's Distinguished Graduate Fellowship (Declined)**, *University of California, Davis* **Apr 2021**
- **Musculoskeletal Biomechanics Research Fellowship**, *Oak Ridge Institute for Science and Education* **Jan 2020**
- **Science Communication Fellowship (Declined)**, *Oregon Museum of Science and Industry* **Nov 2018**

- **Blue Ribbon Poster Award**, *Orthopaedic Research Society* **Aug 2017**

TEACHING

BME 4250: Biomechanics I **Aug–Dec 2023**
Graduate Teaching Assistant, University of Utah
Professor: Amy Lenz
- Held office hours for 3 hours per week for students looking for guidance on problem sets and lab reports
- Graded assignments problem sets, lab quizzes, and technical lab reports (Canvas, Gradescope)

CBEE 414: Process Engineering Lab **Sept–Dec 2019**
Graduate Teaching Assistant, Oregon State University
Professors: Natasha Mallette, Elain Fu, Kaichang Li
- Held writing help sessions for 4 hours per week for students looking to improve their writing skills for more concise and effective dissemination of their work
- Graded assignments ranging from short 1-page writing assignments to long technical lab reports

PROFESSIONAL DEVELOPMENT

- **Foot & Ankle International**, *Reviewer* **2023–Present**
- **Biological Reviews**, *Reviewer* **2023–Present**
- **Arthroscopy: The Journal of Arthroscopic and Related Surgery**, *Reviewer* **2021–Present**
- **FANUC Basic Programming**, *FANUC Corporation* **Feb 2022**
- **Series 793/MPT Introduction**, *MTS Systems Corporation* **June 2020**
- **Series 793 Configuration**, *MTS Systems Corporation* **June 2020**
- **Orthopaedic Research Society**, *Member* **2017–2018**
- **IEEE**, *Student Member* **2017–2018**
- **IEEE Engineering in Medicine and Biology Society**, *Student Member* **2017–2018**
- **American Chemical Society**, *Member* **2011–2015**

LEADERSHIP & SERVICE

- **American Society of Biomechanics Utah Student Chapter**, *Vice President/Treasurer* **2022–Present**
- **Utah BME Graduate Student Advisory Committee**, *DEI Co-Chair, Treasurer* **2021–Present**
- **Utah Graduate Women in Biomedical Engineering**, *Member* **2021–Present**
- **OSU CBEE Graduate Student Association**, *BioE Chairman* **2017–2018**
- **OSU Robotics Graduate Student Association**, *Co-Founder & Co-President* **2016–2018**

COMMUNITY

- **TEDxSaltLakeCity**, *Organizing Committee, Salt Lake City, UT* **Sept 2023–Present**
- **Wasatch Adaptive Sports**, *Snowbird, UT* **Nov 2022–Present**
- **WeDo Lego Robotics**, *OSU STEM Academy, Corvallis, OR* **Apr 2016–Dec 2019**
- **Boy & Girls Club**, *Corvallis, OR* **Apr–Sept 2016**
- **Makers Club**, *Corvallis-Benton County Public Library, Corvallis, OR* **Apr–Sept 2016**
- **Relay for Life**, *Wofford College, Spartanburg, SC* **Mar 2013, 2014, 2015**
- **Habitat for Humanity**, *Spartanburg, SC* **Jan 2013, 2014**

NEWS & PRESS

- **OSU College of Engineering** **Sept 2019**
- **Momentum Magazine** **Jun 2019**