

# ANTHONY H LE

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## EDUCATION

<b>PhD in Biomedical Engineering</b> <i>University of Utah</i>	<b>Aug 2025</b> <i>Salt Lake City, UT, USA</i>
<ul style="list-style-type: none"><li>Dissertation: "Characterizing Talocrural, Subtalar, and Midtarsal Joint Kinematics and Interactions Using Robotic Cadaveric Simulation"<ul style="list-style-type: none"><li>Committee Chair: Dr. Amy L. Lenz</li><li>Committee Members: Drs. Heath B. Henninger, Jeffrey A. Weiss, Robert W. Hitchcock, Alan Kuntz</li></ul></li><li>Relevant Coursework: Medical Robotics, Motion Planning, Functional Anatomy for Engineers, Biomechanics, Computational Biomechanics, Biomaterials, Biomechanics of Human Movement, Proposal Writing &amp; Presentation</li></ul>	
<b>Graduate Certificate in Deep Learning in AI &amp; Robotics</b> <i>University of Utah</i>	<b>May 2025</b> <i>Salt Lake City, UT, USA</i>
<ul style="list-style-type: none"><li>Industry Capstone: "Supervised Fine-Tuning Faster R-CNN for Roadside Guardrail Damage Detection" sponsored by Blynchy AI</li><li>Relevant Coursework: Applied Data Visualization, Machine Learning, Medical Robotics, Deep Learning</li></ul>	
<b>MS in Bioengineering, Minor in Robotics</b> <i>Oregon State University</i>	<b>Dec 2020</b> <i>Corvallis, OR, USA</i>
<ul style="list-style-type: none"><li>Thesis: "Biomechanical Modeling of Isometric Muscle-Tendon Force Generation Through Tendons Coupled in Parallel and a Passive Differential Mechanism"<ul style="list-style-type: none"><li>Co-Advisors: Drs. Ravi Balasubramanian and James D. Sweeney</li><li>Committee Members: Drs. William D. Smart, Adam Z. Higgins, David P. Cann</li></ul></li><li>Relevant Coursework: Drug &amp; Medical Device Regulations in Technology Development, Physiology for Engineers, Biomechanics of Musculoskeletal Injury, Motor Control &amp; Movement Dysfunction, Sequential Decision Making in Robotics, Human Control Systems, Applied Robotics, Nonlinear Dynamic Analysis, Numerical Linear Algebra, Numerical Methods, Data Science for Engineers</li></ul>	
<b>BS in Chemistry, Minor in Applied Mathematics</b> <i>Wofford College</i>	<b>May 2015</b> <i>Spartanburg, SC, USA</i>
<ul style="list-style-type: none"><li>Relevant Coursework: Human Physiology, Pathology &amp; Histology, Biochemistry, Advanced Organic Chemistry, Physical Chemistry, Organic Chemistry, Cellular Biology, Genetics &amp; Molecular Biology, Linear Algebra, Differential Equations, Mathematical Proofs, Multivariable Calculus, Statistics, Physics, Programming &amp; Problem-Solving</li></ul>	

## EXPERIENCES

<b>Graduate Research Assistant</b> <i>Foot &amp; Ankle Mechanics and Morphology Laboratory, University of Utah</i>	<b>Jan 2022–Present</b> <i>Salt Lake City, UT, USA</i>
<ul style="list-style-type: none"><li>Led product development research with an orthopaedic device company, designing experiments and preclinical tests to evaluate functionality and support FDA compliance</li><li>Integrated a robotic system with actuators, sensors, and motion capture to simulate motion in cadaveric lower limb specimens for preclinical orthopaedic foot &amp; ankle research</li><li>Developed data-driven control algorithms for a robotic system to replicate human gait in lower limb cadaveric specimens using Python and LabVIEW</li><li>Analyzed time-series biomechanical data to guide clinical decision-making and surgical planning for orthopaedic foot &amp; ankle surgeries using advanced statistical methods in Python, MATLAB, and R</li><li>Collaborated with orthopaedic surgeons to translate research into actionable insights for surgical planning and patient care</li><li>Mentored students in data analysis, software development, and experimental design for collaborative research projects</li><li>Certified in GCP, human subjects research, and biomedical research ethics to ensure ethical and regulatory compliance</li><li>Co-authored 3+ peer-reviewed publications on biomechanics, biomedical engineering, and machine learning application</li></ul>	
<b>Research Analyst</b> <i>Orthopaedic Research Laboratory, University of Utah Health</i>	<b>Oct–Dec 2021</b> <i>Salt Lake City, UT, USA</i>
<ul style="list-style-type: none"><li>Built data processing pipelines to calculate 3D joint kinematics from motion capture data using Python and MATLAB</li><li>Applied statistical parametric mapping (SPM) to identify spatial-temporal patterns in musculoskeletal function</li><li>Leveraged SPM to interpret time-series biomechanical data and assess variability and surgical outcomes</li><li>Analyzed population variability in tibial morphology across 100+ CT scans using statistical shape modeling and medical image analysis</li></ul>	
<b>Musculoskeletal Biomechanics Research Fellow</b> <i>Walter Reed National Military Medical Center</i>	<b>Mar 2020–Sept 2021</b> <i>Bethesda, MD, USA</i>
<ul style="list-style-type: none"><li>Designed custom fixtures and experimental setups for cadaveric biomechanical testing of orthopedic interventions across six anatomical models using SolidWorks, 3D printing, and CNC machining</li></ul>	

- Built data collection pipelines with force sensors, motion capture, and material testing systems to support biomechanical analysis using Python and MATLAB
- Analyzed large biomechanical datasets from cadaveric experiments to evaluate 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 experimental data and delivered data-driven recommendations to orthopaedic surgeons to optimize surgical treatment strategies
- Partnered with surgeons and engineers to design experiments for medical device evaluation and FDA compliance
- Co-authored 12+ peer-reviewed publications in orthopaedics, trauma, and sports medicine journals

#### **Graduate Research Assistant**

*Robotics & Human Control Systems Laboratory, Oregon State University*

**Sept 2016–Feb 2020**

*Corvallis, OR, USA*

- Built data-driven biomechanical models to simulate muscle forces and joint torques in upper extremity tendon transfer surgeries using MATLAB
- Designed data collection pipelines using FES, force sensors, and motion capture in preclinical animal studies
- Created custom fixtures with SolidWorks and 3D printing to measure multi-toe tip forces in chicken foot models
- Developed IACUC-approved protocols for validating implants in preclinical studies
- Supervised 2 research assistants in device design and data analysis, supporting efficient modeling and hypothesis testing
- Co-authored 2+ peer-reviewed publications in biomechanics and veterinary science

#### **Undergraduate Research Assistant**

*Tomasino Laboratory, Oregon State University Food Science and Technology*

**Apr–Sept 2016**

*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**

*E. & J. Gallo Research Laboratory, E. & J. Gallo Winery*

**Jun–Nov 2015**

*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**

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- **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-NN, SVM, Logistic 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**

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

- Built LSTM, CNN-LSTM, LSTM+Attention, and Transformer models to predict lower limb muscle forces from ground reaction forces, achieving 92% test accuracy
- Developed preprocessing pipelines for time-series data, using normalization and Bayesian optimization to improve model performance

#### **Exploring Text Classification for Predicting Trial Outcomes in Old Bailey Proceedings**

- Implemented machine learning models (ID3, Perceptron, SVM, Logistic Regression, Neural Networks) to classify trial outcomes from Old Bailey proceedings, achieving 81% accuracy
- Used feature engineering and PCA to optimize input data and reduce model training time

#### **Early Failure Detection in Autonomous Surgical Soft-Tissue Manipulation via Uncertainty Quantification**

- Analyzed uncertainty quantification methods (deep ensembles, Monte Carlo dropout) for surgical soft-tissue manipulation using PyTorch and the DeformerNet framework

#### **Mobile Air Quality Monitoring in the Salt Lake Valley**

- Mapped geospatial air quality data and analyzed correlations with socioeconomic factors to highlight exposure disparities
- Built an interactive visualization using Python, GeoPandas, Folium, and related tools

#### **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**

- Built a CNN to classify satellite images as ships or icebergs, 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 iLQR to optimize object-reaching tasks for a 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**

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1. AH Le, B Keller, T Lunde, SD Uhlrich, A Silder, BC Heiderscheit, DG Thelen, AL Lenz. "Sequence- and Attention-Based Models for Predicting Lower Limb Muscle Forces from Ground Reaction Forces During the Stance Phase of Gait," *Comput Methods Biomed Engin, In Preparation*
2. AH Le, O Skoda, HB Henninger, AL Lenz. "Characterizing the Relationship Between Isolated Extrinsic Muscle Activity and Talocrural, Subtalar, and Midtarsal Joint Kinematics," *J Biomech, Submitted Dec 2025*
3. ST Jones, AH Le, R Raj, D Sacharny, Z Al-Halah, TC Henderson, S Kundur. "Fine-Tuning Pre-Trained Faster R-CNN to Reduce False Positives in Guardrail Damage Detection from Dashcam Images," *IEEE Southwest Symposium on Image Analysis and Interpretation (SSIAI), Submitted Nov 2025*
4. AH Le, K Knutson, AC Peterson, BA MacWilliams, KM Kruger, AL Lenz. "Cardan Sequence Selection Influences Subtalar and Talonavicular Joint Kinematics," *J Biomech, Published Nov 2025*
5. 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, Published Jun 2025*
6. 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," *Arthrosc Sports Med Rehabil, Published Apr 2025*
7. J Thompson, R Koe, A Le, G Goodman, DS Brown, A Kuntz. "Early Failure Detection in Autonomous Surgical Soft-Tissue

Manipulation via Uncertainty Quantification," *arXiv preprint, Published Jan 2025*

8. 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*
9. 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*
10. 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*
11. 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*
12. 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*
13. 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*
14. 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*
15. 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*
16. **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*
17. 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

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### Oral Presentations

1. **AH Le**, SD Uhlrich, AL Lenz. "Sequence and Attention Models For Predicting Lower Limb Muscle Forces From Ground Reaction Forces," *20th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Barcelona, ESP, Sept 2025*
2. **AH Le**, AC Peterson, K Knutson, BA MacWilliams, KM Kruger, AL Lenz. "Influence of Cardan Sequences on Ankle and Hindfoot Kinematics," *XXX Congress of International Society of Biomechanics, Stockholm, SWE, Jul 2025*
3. **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*
4. **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*
5. 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*
6. 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*
7. 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*
8. 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*

9. 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*
10. 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, CAN, Sept 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 Arthroscopy Association of North America, San Francisco, CA, USA, May 2022*
12. 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 Springs, WV, USA, Apr 2022*
13. 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*
14. 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*
15. 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*
16. 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*
17. 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*
18. 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*
19. 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*
20. 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*
21. 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*
22. DF Colantonio, **AH Le**, LE Keeling, SE Slaven, MD Helgeson, ES Chang, H Gibbs. "Biomechanical Comparison of On-lay 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*
23. 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*
24. **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*
25. **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. NB Pathare, **AH Le**, AL Lenz. "Effects of Tibialis Anterior and Posterior Synergy Perturbations on Multi-Joint Foot Kinematics at Heel Strike," *Orthopaedic Research Society 2026 Annual Meeting, Charlotte, NC, USA, Mar 2026*
2. JM Nicolescu, **AH Le**, AC Peterson, AL Lenz. "Metatarsal Strains During Passive Foot Motion and Windlass Mechanism Engagement," *American Society of Biomechanics 2025 Meeting, Pittsburg, PA, USA, Aug 2025*
3. 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*
4. **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*
5. **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*
6. **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*
7. **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*
8. 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*
9. 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*
10. 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*
11. **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*
12. **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*
13. **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*
14. 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*
15. **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*
16. **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

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|---|-----------------|
| • <b>David Winter Young Investigator Award Finalist</b> , <i>International Society of Biomechanics</i>    | <b>May 2023</b> |
| • <b>Best Doctoral Poster Presentation Award</b> , <i>Rocky Mountain American Society of Biomechanics</i> | <b>Apr 2023</b> |

• Arthroscopy Journal Award for Basic Science Research Excellence Runner-Up, <i>Arthroscopy</i>	Jan 2022
• Dean's Distinguished Graduate Fellowship (Declined), <i>University of California, Davis</i>	Apr 2021
• Musculoskeletal Biomechanics Research Fellowship, <i>Oak Ridge Institute for Science and Education</i>	Jan 2020
• Science Communication Fellowship (Declined), <i>Oregon Museum of Science and Industry</i>	Nov 2018
• Blue Ribbon Poster Award, <i>Orthopaedic Research Society</i>	Aug 2017

## TEACHING

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### 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

## ADVISING

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### Graduate Students

- Brian Keller, BS/MS in Biomedical Engineering, *University of Utah, 2026*
- Ty Lunde, BS/MS in Biomedical Engineering, *University of Utah, 2026*
- Jordy Larrea Rodriguez, BS/MS in Computer Engineering, *University of Utah, 2025*

### Medical Students

- Alayna Arnholt, MD, *University of Utah School of Medicine, 2026*
- Joon Chung, MD, *Georgetown University School of Medicine, 2023*

### Undergraduate Students

- Zuhair Hawa, BS in Bioengineering, *Rice University, 2021*
- Justin Casebier, BS in Mechanical Engineering, *Oregon State University, 2018*
- Matthew Hwee, BS in Mechanical Engineering, *Oregon State University, 2018*

## COLLABORATORS

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### University of Utah

- Heath Henninger, Associate Professor and Orthopaedic Research Laboratory Director, Department of Orthopaedics
- Florian Nickisch, Associate Professor and Orthopaedic Foot & Ankle Surgeon, Department of Orthopaedics
- Charles Saltzman, Professor and Orthopaedic Foot & Ankle Surgeon, Department of Orthopaedics
- Oliver Sroka, Orthopaedic Surgery Resident, Department of Orthopaedics
- Alan Kuntz, Assistant Professor, Kahlert School of Computing and Robotics Center

### Paragon 28

- Mathew Anderle, Manager, Clinical Science
- Kevin Dodd, Senior Product Development Engineer, Arthroplasty
- Richard Obert, Engineering Director, FOCUS Medical Design & Development (Contract)

### Worcester Polytechnic Institute

- Karen Troy, Professor, Department Head, Department of Biomedical Engineering
- Julia Nicolescu, PhD Candidate, Department of Biomedical Engineering

### Inova Health System

- Edward Chang, Orthopaedic Sports Medicine Surgeon, Department of Orthopaedics

### Walter Reed National Military Medical Center

- Trey Colantonio, Orthopaedic Surgery Resident, Department of Orthopaedics
- Mel Helgeson, Department Chair and Orthopaedic Spine Surgeon, Department of Orthopaedics
- Brad Hendershot, Senior Scientist, Extremity Trauma and Amputation Center of Excellence
- AJ Pisano, Orthopaedic Spine Surgeon, Department of Orthopaedics
- Scott Wagner, Orthopaedic Spine Surgeon, Department of Orthopaedics
- Christopher Tucker, Orthopaedic Sports Medicine Surgeon, Department of Orthopaedics
- Tim Murphy, Orthopaedic Surgery Resident, Department of Orthopaedics

- Patrick Mescher, *Orthopaedic Surgery Resident, Department of Orthopaedics*

## Oregon State University

- Jennifer Warnock, *Associate Professor and Veterinarian, College of Veterinary Medicine*
- Maureen Larson, *Senior Faculty Research Assistant, College of Veterinary Medicine*
- Jennifer Sargent, *Instructor and Veterinarian, College of Veterinary Medicine*
- Won Suk You, *Postdoctoral Research Fellow, Department of Mechanical Engineering*

## PROFESSIONAL DEVELOPMENT

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• <b>Journal of Biomechanics, Reviewer</b>	2024–2025
• <b>Foot &amp; Ankle International, Reviewer</b>	2023–2025
• <b>Biological Reviews, Reviewer</b>	2023–2025
• <b>Arthroscopy: The Journal of Arthroscopic and Related Surgery, Reviewer</b>	2021–2025
• <b>FANUC Basic Programming, FANUC Corporation</b>	Feb 2022
• <b>Series 793/MPT Introduction, MTS Systems Corporation</b>	June 2020
• <b>Series 793 Configuration, MTS Systems Corporation</b>	June 2020
• <b>Orthopaedic Research Society, Member</b>	2017–2018
• <b>IEEE, Student Member</b>	2017–2018
• <b>IEEE Engineering in Medicine and Biology Society, Student Member</b>	2017–2018
• <b>American Chemical Society, Member</b>	2011–2015

## LEADERSHIP & SERVICE

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• <b>American Society of Biomechanics Utah Student Chapter, Vice President/Treasurer</b>	2022–2025
• <b>Utah BME Graduate Student Advisory Committee, DEI Co-Chair, Treasurer</b>	2021–2025
• <b>Utah Graduate Women in Biomedical Engineering, Member</b>	2021–2025
• <b>OSU CBEE Graduate Student Association, BioE Chairman</b>	2017–2018
• <b>OSU Robotics Graduate Student Association, Co-Founder &amp; Co-President</b>	2016–2018

## COMMUNITY

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• <b>TEDxSaltLakeCity, Organizing Committee, Salt Lake City, UT</b>	Sept 2023–2025
• <b>Wasatch Adaptive Sports, Snowbird, UT</b>	Nov 2022–2025
• <b>WeDo Lego Robotics, OSU STEM Academy, Corvallis, OR</b>	Apr 2016–Dec 2019
• <b>Boy &amp; Girls Club, Corvallis, OR</b>	Apr–Sept 2016
• <b>Makers Club, Corvallis-Benton County Public Library, Corvallis, OR</b>	Apr–Sept 2016
• <b>Relay for Life, Wofford College, Spartanburg, SC</b>	Mar 2013, 2014, 2015
• <b>Habitat for Humanity, Spartanburg, SC</b>	Jan 2013, 2014

## NEWS & PRESS

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• <b>OSU College of Engineering</b>	Sept 2019
• <b>Momentum Magazine</b>	Jun 2019