	Tuesday, August 2	Wednesday, August 3					Thursday, August 4					Friday, August 5				
7:00		Continental Breakfast			Diversity Breakfast		Continental Breakfast			Women in Science Breakfast		5K Fun Run				
7:30																
8:00		Opening Ceremony Keynote - Sheila Patek, PhD (Ballroom A)					ISBS Keynote - Duane Knudson, PhD (Ballroom A)					Continental Breakfast				
8:30	Outreach Expo - Biomechanics Education Activities (Hunt Library - Centennial Campus)															
9:00		Break					Break					Break				
9:30		Computat-ional Models	Lower Extremity Prostheses	Energetics	Head Impacts And Concussion	Gait In People With Obesity	Loading Parameter	Variability: Gait	Finite Element Analysis	Knee Loading	Upper Extremity Sport	Human Augmenta-tion	Balance	Gait	Methods In Gait Analysis	Knee Pathology
10:00																
10:30		Break					Break					Break				
11:00																
11:30		Minimal Footwear	Wrist and Hand	Slips, Trips, and Falls	Jumping And Landing	Human Skeletal Muscles	Concussion	Comparat-ive	Modeling And Simulation	Ergonomics	All About Running	Teaching	Population Diversity	Hip	Ankle Orthoses	Upper Extremity
12:00	Registration opens (Hallway North)															
12:30		Lunch			Founders and Fellows Forum (Ballroom A)		Lunch			Mentoring Events		Lunch			Business Meeting (Ballroom A)	
13:00	Tutorials (Raleigh Convention Center) & Lab Tours (Centennial Campus)															
13:30		Poster Session I (Ballroom B/C)					Keynote - Borelli Award (Ballroom A)					Keynote - Hay Award (Ballroom A)				
14:00																
14:30							Poster Session II (Ballroom B/C)					Award Session (Ballroom A)				
15:00												Break				
15:30												Bone	Shoulder Girdle	Gait	Biofeedback Training	Foot And Ankle
16:00																
16:30		ISB Keynote - Tibor Hortobágyi, PhD (Ballroom A)														
17:00												Closing Ceremony & Awards (Ballroom A)				
17:30	Student Event (306A): Student Welcome to ASB	Student Career Round Table (Hallway North)		Night on the town in Raleigh								ASB Executive Board Meeting				
18:00																
18:30	Opening Reception (Raleigh Convention Center)						Banquet (NC Museum of Natural Sciences)									
19:00																
19:30																
20:00		Student Night Out: Jiddi Courtyard														
20:30																
21:00																
21:30																

Wednesday, August 3, 9:15 – 10:45 AM

	Validation Of Computational Models With Orthopaedic And Biomechanics Applications	Approaches For Improving Lower Extremity Prosthetics	Energetics Of Human Movement	Head Impacts And Concussion	Gait In People With Obesity
	306A	306B	306C	305A	305B
Chair **Co-Chair**	Timothy Burkhart *Western University*	Kenton Kaufman *Mayo Clinic* Karl Zelik *Vanderbilt University*	Rodger Kram *University of Colorado* Wouter Hoogkamer *University of Colorado*	J.J. Trey Crisco *Brown University* Thomas Buckley *University of Delaware*	Stephen Messier *Wake Forest University* Max Paquette *University of Memphisr*
9:15 AM	**Computational Modeling Of Orthopaedic Devices: Towards Establishment Of Guidance For Credible Use** Jeffrey Bischoff *Zimmer Biomet, Inc.* **A Perspective On Validation Of Finite Element Models In Orthopaedic Biomechanics** Tina Morrison, William Zaylor, Jason Halloran *Center for Devices and Radiological Health, Food and Drug Administration* **Is My Model Good Enough? Verification And Validation Of Musculoskeletal Models And Simulations** Jennifer Hicks, Thomas Uchida, Ajay Seth, Apoorva Rajagopal, Scott Delp *Stanford University* **How Are Women Included In Valdiation Of Hip Arthroplasty Finite Element Models?** Chien-Yu Lin, Richard Hughes *National Cheng Kung University*	**Optimal Control Of An Electromechanical Above-Knee Active Prostheses With Energy Regeneration** Farbod Rohani, Hanz Richter, Antonie van den Bogert *Cleveland State University*	**Can Active Ankle Foot Orthoses Reduce Energy Cost Of Walking In Individuals With Crouch Gait?** Michael Rosenberg, Katherine Steele *University of Washington*	**Athlete Head Impacts Measured With An 'Intelligent Mouthguard'** Adam Bartsch, Sergey Samorezov *Cleveland Clinic*	**The Determinants Of The Preferred Walking Speed In Obese Adults** Davide Malatesta, Aitor Fernandez Menendez, Gilles Saudan, Ludovic Sperisen Sperisen, Didier Hans, Mathieu Saubade, Gregoire P. Millet *Institute of Sport Sciences (ISSUL), University of Lausanne*
9:30 AM		**Comparison Of Inverted Pendulum Models During Walking On Slopes: Application To Prosthesis Performance** Nathaniel Pickle, Jason Wilken, Jennifer Whitehead, Audrey Westbrook, Anne Silverman *Colorado School of Mines, Golden, CO*	**Effect Of Normobaric Hypoxic Walking Training On Mechanics, Energetics And Perceived Exertion Of Gait In Obese Adults** Aitor Fernandez Menendez, Gilles Saudan, Ludovic Sperisen, Didier Hans, Mathieu Saubade, Gregoire Millet, Davide Malatesta *Institute of Sport Sciences (ISSUL), University of Lausanne*	**Repeated Head Impacts Do Not Adversely Affect Tandem Gait Performance** Melissa DiFabio, Jessie Oldham, Chelsea Best, Ryan DeWolf, Thomas Kaminski, Thomas Buckley *University of Delaware*	**Effects Of Altered Walking Speed And Simulated Weight Gain On Medial Tibiofemoral Joint Contact Force Parameters** Joaquin Barrios, John Willson *University of Dayton*
9:45 AM		**Importance Of Prosthetic Ankle Range-Of-Motion For Ascending And Descending Slopes** Erik Lamers, Karl Zelik *Vanderbilt University*	**The Goldilocks Zone: Interplay Of Elastic Exoskeleton Assistance And Walking Speed On The Mechanics And Energetics Of Walking** Richard Nuckols, Gregory Sawicki *University of North Carolina*	**Concussion History Does Not Adversely Affect Dual-Task Gait** Jessie Oldham, Melissa DiFabio, Ryan DeWolf, Thomas Kaminski, Thomas Buckley *University of Delaware*	**The Influence Of Walking Velocity And Stride Length On The Knee In Obese Adults** Michael Bijman, Clare Milner *Drexel University*
10:00 AM		**Characterizing The Stiffness Of Lower-Limb Running-Specific Prostheses** Owen Beck, Paolo Taboga, Alena Grabowski *University of Colorado, Boulder, CO*	**The Biomechanics And Energetics Of Skateboarding** Bryant Pham, Rodger Kram *University of Colorado, Boulder*	**Interpreting Decreased High-Frequency Center Of Pressure Complexity In Recently Concussed Asymptomatic Athletes** Peter Fino, Maury Nussbaum, Per Brolinson *Virginia Tech*	**Greater Incidence Of Heel Strike Transient In Obese Compared To Normal Weight Adults** Derek Pamukoff, Robert Dudley, Michael Vakula, Troy Blackburn *California State University, Fullerton*
10:15 AM		**Predicting The Metabolic Cost Of Walking With Minimal Gait Deviations Following Amputation** Elizabeth Russell Esposito, Ross Miller *Center for the Intrepid*	**Metabolic Cost Of Walking With An Energy Harvesting Backpack At Different Speeds And Grades** Courtney Webster, Maria Talarico, Andrew Tweedell, Jose Collazo, Julianne Douglas *ARL-HRED*	**Concussion History Influences Neuromotor Performance After Exposure To Repetitive Low-Level Blast Exposure** Christopher Rhea, Nikita Kuznetsov, Jason Bailie, Matthew Yanagi, Benjamin Long, F. Jay Haran, Scott Ross, W. Geoffrey Wright *University of North Carolina at Greensboro*	**Independent Contributions Of Weight And Mass To The Metabolic Cost Of Walking Uphill And Downhill** Albert Angiolillo, Alena Grabowski *University of Colorado, Boulder*
10:30 AM		**Frontal Plane Movement Adaptations For Individuals With Dysvascular Transtibial Amputation** Matthew Miller, Amanda Murray, Brecca Gaffney, Victor Cheuy, Bradley Davidson, Cory Christiansen *University of Colorado, Denver Anschutz Medical Campus*	**Sex Differences In Energy Absorption During A Triple-Hop Landing** Adam Marmon, Amelia Arundale, Holly Silvers, Ryan Zarzycki, Anahid Ebrahimi, Lynn Snyder-Mackler *University of Delaware*	**No Relationship Between Head Impacts And Dual Task Dynamic Postural Control In Collegiate Football Players** Thomas Buckley, Jessie Oldham, Kelsey Evans, Nick Murray, Barry Munkasy *University of Delaware*	**Estimating Annual Accumulated Knee Loading In Obese Vs. Cross Country Runners** Jessica Hunter, Ross Miller *University of Maryland College Park*

Wednesday, August 3, 11:00 AM– 12:30 PM

	Minimal Footwear: It'S Not Just For Running!	Wrist And Hand	Slips, Trips, And Falls	Jumping And Landing	Biomechanics Of Human Skeletal Muscles
	306A	306B	306C	305A	305B
Chair Co-Chair	Irene Davis *Spaulding National Running Center*	Wendy Murray *Northwestern University* Dustin Crouch *North Carolina State University*	Mark Grabiner *University of Illinois at Chicago* Jason Franz *University of North Carolina*	Jill McNitt-Gray *University of Southern California* Alison Sheets-Singer *Nike*	Walter Herzog *University of Calgary* Heiliane Fontana *Federal University of Santa Catarina*
11:00 AM		**Does A Morphologically Defined Coordinate System For The Carpometacarpal Joint Change With Osteoarthritis Progession?** Briana Warschun, Tarpit Patel, Douglas Moore, Amy Ladd, Arnold-Peter Weiss, Joseph Crisco *Center for Biomedical Engineering and School of Engineering, Brown University, Providence, RI*	**Manual And Cognitive Dual-Tasks Contribute To Fall-Risk Differentiation In Posturography Measures** Renee Beach Sample, Allison Kinney, Kurt Jackson, Wiebke Diestelkamp, Kimberly Bigelow *University of Dayton, Department of Mechanical and Aerospace Engineering*	**Can Muscle Volume Be A Predictor Of Motor Performance?** Thanh Tran, Katherine Knaus, Peter Frank, Geoffrey Handsfield, Joseph Hart, Silvia Blemker *University of Virginia*	**Increased Performance During The Stetch-Shortening Cycle More Than Stretch Reflex And Recoil Of Elastic Energy** Daniel Hahn, Wolfgang Seiberl, Geoffrey A. Power, Walter Herzog *Ruhr-University Bochum*
11:15 AM		**A Novel Computational Modeling Explains Postural Effects On Strain Distribution In Finger Extensor Apparatus** Sang Wook Lee, Derek Kamper *Catholic University of America*	**Fall-Recovery Training Of An Individual With Chronic Stroke: A Case Study On Kinematic Variables** Jamie Pigman, Benjamin Conner, Darcy Reisman, Jeremy Crenshaw *University of Delaware*	**Differential Effect Of Neuromuscular Training On Hip Biomechanics During Single Leg Drop In Healthy And Acl-Reconstructed Populations** Tiffany Marulli *The Ohio State University Sports Medicine*	**Muscle Length And Activation Level Affect Human Tibialis Anterior Central Aponeurosis Stiffness In Vivo** Brent Raiteri, Andrew Cresswell, Glen Lichtwark *The University of Queensland*
11:30 AM	**To Cushion Or Not To Cushion: From Minimal To Maximal Shoes** Irene Davis, Matt Ruder, Steven Jamison, Hannah Rice *Spaulding National Running Center*	**Claw Finger Deformity Is Most Sensitive To Shortening Of Extrinsic Finger Flexors: Preliminary Findings** Benjamin Binder-Markey, Julius Dewald, Wendy Murray *Northwestern University*	**Trailing Limb Response Characteristics Are Associated With Fall Direction Following Laboratory-Induced Slips** Leigh Allin, Maury Nussbaum, Michael Madigan *Texas A&M University*	**Functional Data Analysis Determines Specific Anticipation Threshold For Knee Kinematics In A Reactive Jump-Landing Task** Mitchell Stephenson, Qin Zhu, Boyi Dai *Iowa State University*	**Measurement Of Intramuscular Pressure, Force, And Electromyography In The Tibialis Anterior Muscle During Ramped Isometric Contractions** Shanette Go, William Litchy, Kenton Kaufman *Mayo Clinic*
11:45 AM	**Strengthening Intrinsic Foot Muscles, One Step At A Time** Sarah Ridge, A. Wayne Johnson, Irene Davis *Brigham Young University* **Minimal Footwear Use In Knee Oa** Najia Shakoor *Rush University Medical Center*	**Quantifying Changes In Hand Function: A Model For Use In Rehabilitation.** Joshua Drost, Hyokyoung Hong, Tamara Bush *Michigan State University*	**Association Between Trunk Motion And Individual Characteristics Before And After Trip-Training** Miranda Hege, Brian Cone, Iryna Babik, Matthew Wittstein, Adam Kiefer, Christopher Rhea *University of North Carolina at Greensboro*	**Association Of Weight Bearing Ankle Dorsiflexion Range Of Motion On Sagittal Plane Kinematics During Single-Leg Drop Jump In Healthy Males** Brittany Dowling, April McPherson, Caitlin Pearl, Walter Laughlin, Jacob Stone *Motus Global*	**Vastus Lateralis Maximum Force-Generating Potential Occurs At Optimal Fascicle Length Regardless Of Activation Level** Heiliane de Brito Fontana, Walter Herzog *Federal University of Santa Catarina*
12:00 PM		**Low-Dimensional Emg-Driven Musculoskeletal Model Enables Effective Real-Time Simultaneous Multi-Joint Control Of A Virtual Hand** Dustin Crouch, He Huang *North Carolina State University*	**Correlation Between Slip Severity And Muscle Synergies Of Slipping** Mohammad Moein Nazifi, Kurt Beschorner, Pilwon Hur *Texas A&M University*	**Kinematics During Single Leg Squat And Step Down Tasks In Individuals With Unilateral Hip Pain And Healthy Controls** Anne Khuu, Kari L. Loverro, Cara L. Lewis *Boston University*	**Fiber Operating Ranges Of Lower Limb Muscles: Where Does Yoga Stand?** Katherine Crump, Kelley Virgilio, Tamara Fischer-White, John Miller, Shawn Russell, Ann Taylor, Silvia Blemker *University of Virginia*
12:15 PM		**Does The Flexor Pollicis Longus Act As A Flexor During Synergistic Wrist Motion?** Andrew Thoreson *Mayo Clinic*	**Estimation Of Ankle Impedance When Walking On A Slippery Walkway** Mariah Whitmore, Levi Hargrove, Eric Perreault *Northwestern University*	Withdrawn	**Effect Of Exhaustive Hopping On Muscle-Tendon Interaction And Architecture** Paige E. Rice, Daniel E. Lidstone, Herman van Werkhoven, Justin A. Stewart, Reed D. Gurchiek, Maddison E. Burris, Garrett W. Feimster, Jeffrey M. McBride *Department of Health & Exercise Science, Appalachian State University, Boone, NC, 28607*

Thursday, August 4, 9:15 – 10:45 AM

	Will The Real Loading Parameter Please Stand Up?	Variability: Informing Our Understanding Of Gait Biomechanics	Finite Element Analysis	Knee Loading: We Measure, We Model, We Modify	New Insights Into Upper Extremity Sport Biomechanics
	306A	306B	306C	305A	305B
Chair **Co-Chair**	W. Brent Edwards *University of Calgary*	Robert Shapiro *University of Kentucky* Jocelyn Hafer *University of Massachusetts*	Matthew McCullough *North Carolina A&T State University* Ram Haddas *Texas Back Institute Research Foundation*	Kurt Manal *University of Delaware* Adam Marmon *University of Delware*	Ronald Zernicke *University of Michigan* Jessica Deneweth Zendler *University of Michigan*
9:15 AM		**The Association Between Kinematic Variability And Muscle Activity During Perturbed Walking** Heather Stokes, Jessica Thompson, Jason Franz *University of North Carolina at Chapel Hill and North Carolina State University*	**Finite Element Model For Femoral Stress Analysis During Stair Navigation** Chen Deng, Jason Gillette, Timothy Derrick *Iowa State University*	**Interplay Of Biomechanical Factors On Reduced Knee Joint Loads In Patients With Osteoarthritis Following Intensive Weight Loss** Jason Jakiela, Paul DeVita, Daniel Beavers, Stephen Messier *Wake Forest University*	**Relationship Of Pelvic And Trunk Kinematics To Ball Velocity In Professional Baseball Pitchers** Brittany Dowling, Caitlin Pearl, Walter Laughlin, Travis Tubbs, Glenn Fleisig *Motus Global*
9:30 AM	**Modeling Cartilage Conditioning Effects On The Risk Of Knee Osteoarthritis Initiation In Runners And Other Populations** Ross Miller *University of Maryland*	**Coordination Variability: Reliability Analysis And Comparison Across Gait Types** Jocelyn Hafer, Katherine Boyer *University of Massachusetts Amherst*	**Geometric Vs. Material Characteristics Of Finite Element Human Body Model For Crash Injury Analysis** Eunjoo Hwang *University of Michigan Transportation Research Institute*	**Decreasing Knee Joint Contact Loads Via Toe-In Gait For Patients With Knee Osteoarthritis** Taylor Schlotman, Peter Shull, Jeffrey Reinbolt *The University of Tennessee*	**Biomechanics Of Weighted Ball Throwing Exercises For Baseball Pitchers** Glenn Fleisig, Alek Diffendaffer, Kyle Aune, Brett Ivey *American Sports Medicine Institute*
9:45 AM	**Step Rate And Running Speed Manipulation Protocol Effects On Knee Joint Loads Among Individuals After Acl Reconstruction** John Willson, Collin Bowersock, Richard Willy *East Carolina University*	**Variability Of Kinematic And Temporal-Spatial Gait Parameters In Individuals With Hip Dysplasia** Kari Loverro, Anne Khuu, Eva Ciccodicola, Cara Lewis *Boston University*	**Adjacent Level Analysis Of Pre And Post Lumbar Fusion For Scoliosis Patients In Comparison To Healthy Controls - Finite Element Analysis** Ram Haddas, Xu Ming, Isador Lieberman , James Yang *Texas Back Institute Research Foundation*	**Toe-In With And Without Wide Step Width Gait Modifications Reduce Frontal Plane Knee Moments During Stair Ascent In People With Varus, Valgus, And Neutral Knee Alignments** Songning Zhang, Hunter Bennett, Guangping Shen, Max Paquette , Harold Cates *The University of Tennessee*	**Ucl Structural And Material Properties In Collegiate Baseball Pitchers** Christopher Curran, Keleigh Britt, Patrick Rider, Zachary Domire *East Carolina University*
10:00 AM	**Per-Step And Cumulative Loads Taken Within The Context Of Experimental Design And Research Question** Paul DeVita, Kayla Murphy, Jessica McDonnell, Patrick Rider *East Carolina University*	**Trunk And Foot Acceleration Variability During Treadmill And Overground Walking** Jordan Craig, Adam Bruetsch, Jessie Huisinga *University of Kansas Medical Center*	**Ulna-Humerus Contact Mechanics: Multibody Approach Using A Finite Element Model And Experimental Measurements** Mohsen Sharifi Renani, Akin Cil, Antonis Stylianou *University of Missouri-Kansas City*	**Role Of Knee Mechanics In Exercise Induced Osteoarthritis Pain Flares** Katherine Boyer, Carl Jewell, Jocelyn Hafer *University of Massachusetts-Amherst*	**Do Baseball Pitchers Improve Mechanics After Biomechanical Evaluations?** Glenn Fleisig, Alek Diffendaffer, Brett Ivey, Kyle Aune *American Sports Medicine Institute*
10:15 AM	**A Weighted–Impulse Measure For The Estimation Of Overuse Injury Potential Based On Cumulative Damage Theory** W. Brent Edwards *University of Calgary*	**Knee Variability In Patients With Joint Hypermobility Syndrome** Sara Marreiros *Glasgow Caledonian University*	**Finite Element Analysis Of A Novel Hip-Stem For Osteoporotic Femurs** Bidyut Pal, Andrew Amis *Imperial College London*	**Difference In Knee Joint Rotation And Loading Between Total And Unicompartmental Knee Arthroplasties During Stair Descent** Shangcheng Wang *University of North Carolina at Charlotte*	**Dynamic Core Stability In Athletes With And Without Non-Traumatic Shoulder Pain** Courtney Butowicz, Marisa Pontillo, Sheri Silfies, Clare Milner, Dave Ebaugh *Drexel University*
10:30 AM		**How Humans Regulate Variability At Walk-To-Run Transition Speeds** Nicole Bohnsack-McLagan *University of Texas*	**Biomechanical Evaluation Of Reconstruction Plates With Locking And Nonlocking Screws Configurations In Calcaneal Fracture: A Finite Element Model Study** Ching-Hsuan Chen, Ching-hua Hung, Chen-Sheng Chen, Chao-Ching Chiang *National Chiao-Tung University*	**Detection Of Loading Asymmetry After Tka Using Tibial Acceleration** Nicole Ray, Adam Marmon, Joseph Zeni, Brian Knarr *University of Delaware*	**Sleeper Stretch Accelerates Recovery Of Glenohumeral Internal Rotation Following Pitching** Katherine Reuther, Ryan Larsen, Pamela Kuhn, John Kelly, Stephen Thomas *Columbia University*

Thursday, August 4, 11:00 AM – 12:30 PM

	Are We Missing Something After Concussion? Identifying Lingering Balance Control And Cognitive Deficits And Their Potential Consequences.	Comparative Biomechanics	Modeling And Simulation	Where The Rubber Meets The Road: Biomechanics And Ergonomics	All About Running
	306A	306B	306C	305A	305B
Chair **Co-Chair**	David Howell *Boston Children's Hospital*	Steven Piazza *Penn State University* Jonas Rubenson *Penn State University*	Zachary Domire *East Carolina University* Kota Takahashi *University of Nebraska*	Paul deVita *East Carolina University* Abigail Carpenter Schmitt *Duke University*	Irene Davis *Spaulding National Running Center* Rebecca Fellin *USARIEM*
11:00 AM	**Are We Missing Something After Concussion? Identifying The Potential Consequences After Injury** Thomas Buckley, David Howell, Robert Lynall, Daniel Herman *University of Delaware* **Are We Missing Something After Concussion? Identifying Lingering Balance Control Deficits** David Howell, Robert Lynall, Thomas Buckley, Daniel Herman *Boston Children's Hospital* **Are We Missing Something After Concussion? Identifying The Potential Consequences After Injury** Robert Lynall, David Howell, Thomas Buckley, Daniel Herman *University of North Carolina at Chapel Hill* **Are We Missing Something After Concussion? The Role Of Neurocognition In Neuromuscular Performance And Musculoskeletal Injury** Daniel Herman, David Howell, Robert Lynall, Thomas Buckley *University of Florida*	**Improved Modeling, Sensing And Analysis Of Marine Mammal Swimming Kinetics And Kinematics** K. Alex Shorter, Lauro Ojeda, Victor Petrov, Julie Rocho-Levine, Julie van der Hoop, Mark Johnson, Michael Moore *University of Michigan*	**Improving Amputee Balance Control On Cross-Slopes By Adjusting Coronal-Plane Prosthetic Foot Stiffness: A Simulation Study** Courtney Shell, Glenn Klute, Rick Neptune *The University of Texas at Austin*	**Changes In Joint Work Resulting From Pushing A Loaded Cart** Katie Greenert, David Proctor, Stephen Piazza *Penn State University*	**Is The Mechanical Fatigue Of Bone Influenced More By The Impact Or Active Phase Of Running?** Lindsay Loundagin, Tannin Schmidt, W. Brent Edwards *University of Calgary*
11:15 AM		**Adhesion Mechanisms Of Spatula Setae From Male Cybister Diving Beetles** Kai-Jung Chi, Wei-Ting Yueh, Ming-Chih Shih *National Chung-Hsing University*	**Transverse Plane Misalignment Of Ankle Arthrodesis Minimally Changes Range Of Motion Of Distal Foot Joints In Cadaveric Gait Simulation** Brian Cook, Matthew Kindig, Christina Stender, Matthew Beuchel, Garett Pangrazzi, Bruce Sangeorzan, William Ledoux *University of Washington*	**Carrying Asymmetrical Loads During Stair Negotiation: Loaded Limb Stance Vs. Unloaded Limb Stance** Junsig Wang, Jason Gillette *Iowa State University*	**The Influence Of Running Shoes On The Spring-Like Function Of The Foot** Luke Kelly, Glen Lichtwark, Dominic Farris, Andrew Cresswell *The University of Queensland*
11:30 AM		**A Computer Vision Controlled Treadmill With High Speed 3D Motion Capture And Behaviorally Triggered Perturbations For Use In Rodents** Benjamin Robertson, Christian Valenti, Annie Vahedipour, Omid Maghsoudi, Paul Shamble, Andrew Spence *Temple University Dept. of Bioengineering*	**Development And Validation Of A Simulated Landing Model To Investigate Anterior Cruciate Ligament Injury Mechanisms: A Finite Element Analysis** Marcel Ingels, Ali Kiapour, Ata Kiapour, Rodney Summers, Omar Gad, Joshua Kinn, Timothy Hewett, Vijay Goel *The University of Toledo*	**Multiscale Shoe-Floor Friction Model Predicts Impact Of Shoe-Floor-Angle On Utilized Coefficient Of Friction During Slipping** Seyed Reza M. Moghaddam, Kurt E. Beschorner *University of Pittsburgh*	**The Effect Of Running-Induced Neuromuscular Fatigue On Leg Stiffness** Emily Southern, Sarah Kessler, Cristine Agresta, Ronald Zernicke, Grant Goulet, Jessica Deneweth *University of Michigan*
11:45 AM		**The Effect Of Disuse On Muscle Lever Systems In A Rapid-Growing Avian Bipedal Model** Matthew Q Salzano, Stephen J Piazza, Jonas Rubenson *The Pennsylvania State University*	**Simulation Analysis Of Linear Quadratic Regulator Control Of Gait** Raviraj Nataraj *Cleveland State University*	**Foot Positioning Effects On Reestablishing And Maintaining Foot Contact From Ladder Perturbations** Erika Pliner, Kurt Beschorner *University of Pittsburgh*	**Effect Of Step Length Manipulation On Knee Loads While Running With And Without Load Carriage In Rotc Cadets** Richard Willy *East Carolina University*
12:00 PM		**Limited Mechanical Effects Of Intermuscular Myofascial Connections Within The Intact Rat Anterior Crural Compartment** Chris Tijs, Jaap van DieÃ«n, Huub Maas *Vrije Universiteit Amsterdam*	**Automated Fracture Simulation For Ulnae In 3-Point Bending With Elastic-Plastic Material** John Cotton *Ohio University*	**The Influence Of Task Rotation Parameters On Task-Specific Shoulder Strength And Perceived Exertion In Females** Kristen Dickhout, Kathleen MacLean, Clark Dickerson *University of Waterloo*	**Are Midfoot Strike Patterns Similar To Forefoot Strike Patterns When Running In Minimal Footwear?** Steve Jamison *Spaulding National Running Center*
12:15 PM		**Sensory Feedback And Coordinated Landing In Cane Toads** Suzanne Cox, Gary Gillis *University of Massachusetts, Amherst*	**Simulated Gripping Of An Object With A Real-Time Musculoskeletal Model Of The Hand: Application To Prosthesis Control** Edward Chadwick, Dimitra Blana, Amartya Ganguly, Antonie van den Bogert, Wendy Murray *Keele University*	**A Comparison Of Three Seated Tablet Reading Postures And Cervical Spine Flexion Relaxation** Ethan Douglas, Kaitlin Gallagher *University of Arkansas*	**Physical Activity And Running Mechanics Of Prospectively Injured Runners Compared With Controls** Allison H. Gruber, Jacob E. Vollmar, Shane P. Murphy, Andrea K. Chomistek *Indiana University*

Friday, August 5, 9:15 – 10:45 AM

	Quantifying Human Augmentation: State-Of-The-Art & Future Challenges	New Developments In Balance Research	Gait	Methods In Gait Analysis	Knee Pathology And Movement Mechanics
	306A	306B	306C	305A	305B
Chair **Co-Chair**	Karl Zelik *Vanderbilt University*	James Ashton-Miller *University of Michigan* Caitlin O'Connell *University of Pittsburgh*	Joaquin Barrios *University of Dayton* Anahid Ebrahimi *University of Delaware*	John Challis *Penn State University* Allison Gruber *Indiana University*	Robin Queen *Virginia Tech* Kathryn Harrison *Virginia Commonwealth University*
9:15 AM		**Mechanisms Of Postural Stability In Dancers And Non-Dancers** John H Challis *The Pennsylvania State University*	**Cutaneous Sensory Feedback Is A Primary Determinant Of Gait Changes Observed In Barefoot Running** Melissa Thompson, Kristine Hoffman *Fort Lewis College*	**Direct Collocation As A Filter For Inverse Dynamics** Ross Miller, Thomas Kepple, Scott Selbie *University of Maryland*	**Experimental Knee Pain And Movement Intensity Influence Vertical Ground Reaction Force Characteristics** Matt Denning, Jihong Park, Jordan Pitt, Ty Hopkins, Matt Seeley *Weber State University*
9:30 AM	**Quantification Of The Energetic Contributions Of Non-Biomimetic Prosthetic And Orthotic Designs To Human Performance** Steven Stanhope, Anahid Ebrahimi *University of Delaware*	**Effects Of Acute Visual Field Occlusion On Standing Balance** Caitlin O'Connell, Arash Mahboobin, Amy Nau, Scott Drexler, Rakie Cham *University of Pittsburgh*	**Goal-Relevant Correction Of Conflicting Goals During Treadmill Walking** Mandy Salinas, Jonathan Dingwell *The University of Texas at Austin*	**Comparison Of Gait Parameters Using Anatomical- And Functional-Based Methods Of Hip Joint Axis Definitions** Alexander Morgan, Barbara Safarovic, Klaus Weissenboeck, Thomas Almonroeder, Ben Tesch, Kristian O'Connor *University of Wisconsin-Milwaukee*	**In Vivo Measurement Of Tibiofemoral Kinematics And Cartilage Contact Following Acl Injury: Baseline Results Of A Longitudinal Investigation** Michael Vignos, Jarred Kaiser, Geoffrey Baer, Richard Kijowski, Darryl Thelen *University of Wisconsin-Madison*
9:45 AM	**Neuromechanics Of The Interface Between A Human System And A Prosthetic/Orthotic Device** W. Lee Childers *Alabama State University* **Locomotion Adaption To Robotic Exoskeletons And Prostheses** Daniel Ferris *University of Michigan, Ann Arbor*	**Effects Of Peripheral Acute Fatigue On Balance And Reflex Responses** Andresa M.C. Germano, Daniel Schmidt , Thomas L. Milani *Chemnitz University of Technology*	**Cartilage Contact During Gait In An Obese Female: A Case Study** Jing-Sheng Li, Tsung-Yuan Tsai, Guoan Li, David Felson, Cara Lewis *Boston University*	**Model Choice Could Change Clinical Interpretation Of Simulation Results** Sarah Schloemer, Elena Caruthers, Rachel Baker, Nicholas Pelz, Ajit Chaudhari, Robert Siston *The Ohio State University*	**Single-Leg Hop Strategies In Anterior Cruciate Ligament Reconstructed Patients Compared To Healthy Controls** Rachel Tatarski, Joshua Hoffman, Stephanie Di Stasi Roewer, Timothy Hewett *The Ohio State University*
10:00 AM	**Towards Robust Neural Control For Powered Lower Limb Prostheses** He (Helen) Huang, Fan Zhang *University of North Carolina at Chapel Hill* **Quantifying Physical Interface Dynamics: Human-Prosthesis And Human-Exoskeleton Power Transmission** Karl Zelik *Vanderbilt University*	**Effect Of Age On The Forward Perturbation Threshold Line For Lean Releases, Lean Releases With Surface Translations And Surface Translations In Younger, Middle-Aged And Older Adults** Magali Pierre, Cecile Smeesters *Universite de Sherbrooke*	**Deconstructing Ankle And Foot Power During Human Walking: A Segment By Segment Approach** Kate Worster, Dustin Bruening, Kota Takahashi *University of Nebraska Omaha*	**Power Analysis For Using Detrended Fluctuation Analysis On Short Time Series Of Gait Variables** Nikita Kuznetsov, Christopher Rhea *University of North Carolina*	**Lower Knee Flexor Muscle Forces During Gait Are Associated With Second Anterior Cruciate Ligament Injury In Young Female Athletes** Jacob Capin, Ashutosh Khandha, Ryan Zarzycki, Kurt Manal, Thomas Buchanan, Lynn Snyder-Mackler *University of Delaware*
10:15 AM		**Lower Attention Is Associated With Worse Postural Control In Those With Chronic Ankle Instability** Nicholas Than, William Smith, Melanie McGrath, Jennifer Yentes, Adam Rosen *University of Nebraska at Omaha*	**Toe-In And Toe-In With Wider Step Width Gait Modifications Reduce Frontal Plane Knee Moments In Varus, Valgus, And Neutral Knee Alignments During Level Walking** Hunter Bennett, Guangping Shen, Harold Cates, Songning Zhang *University of Tennessee - Knoxville*	**Associations Between Segmental Rotational Angular Momentum And Joint Kinetics** Brecca Gaffney, Cory Christiansen, Amanda Murra, Bradley Davidson *University of Denver*	**The Effect Of Neuromuscular Training On Frontal And Transverse Plane Hip Moments In Healthy And Acl-Reconstructed Populations** Tiffany Marulli *The Ohio State University Sports Medicine*
10:30 AM		**Asymmetric Control Of Leg Muslces In Stance In Young And Older Adults** Ge Wu, Jesse Jacobs *The University of Vermont*	**Four-Year Follow-Up Of Knee Joint Kinematics In Adolescent Females With Patellofemoral Pain** Victor Carlson, Barry Boden, Aricia Shen, Jennifer Jackson, Katharine Alter, Frances Sheehan *National Institutes of Health*	**Allometric Scaling To Control For The Effect Of Walking Velocity On Knee Adduction Moment** Samantha Andrews *University of Hawaii*	**Estimation Of Anterior Cruciate Ligament Loading Under Various Levels Of Neuromuscular Fatigue Using Musculoskeletal Simulations** Michael Samaan, Joshua Weinhandl, Steven Hans, Sebastian Bawab, Stacie Ringleb *University of California-San Francisco*

Friday, August 5, 11:00 AM – 12:30 PM

	Teaching Symposium	Studying Population Diversity In Biomechanics: Is It Warranted?	Hip	Design And Evaluation Of Passive And Powered Ankle Orthoses	Clinical Applications In Upper Extremity Neuromechanics
	306A	306B	306C	305A	305B
Chair **Co-Chair**	Cecile Smeesters *Universite de Sherbrooke*	Matthew McCullough *North Carolina A&T State University*	John Willson *East Carolina University* Cara Lewis *Boston University*	Elizabeth Hsiao-Wecksler *University of Illinois* Katherine Steele *University of Washington*	Mary Rodgers *University of Maryland* Margaret Finley *Drexel University*
11:00 AM			**Soft Tissue Artifact Causes Spurious Hip Joint Movement** Niccolo Fiorentino, Penny Atkins, Michael Kutschke, Kenneth Foreman, Andrew Anderson *University of Utah*	**Speed-Dependent, Proportional Myoelectric Exoskeleton Controller With Adaptive Gains** Tracy Giest, Richard Nuckols, Gregory Sawicki *UNC, Chapel Hill*	**Feasibility Of Quantitative Upper Extremity Biomechanical Analysis To Assess Outcomes In Brachial Plexus Palsy Following Surgery** Micah Garcia *Cincinnati Children's Hospital Medical Center*
11:15 AM			**Sagittal Plane Hip Variability During Distance Running At Different Speeds** Jeff T. Wight *Jacksonville University*	**Confidence In The Curve: Validating Instantaneous Cost Mapping With Bilateral Ankle Exoskeletons** Jeffrey Koller, Deanna Gates, Daniel Ferris, David Remy *University of Michigan, Ann Arbor*	**Upper Extremity Joint Kinematics In Children With Cerebral Palsy During Walker-Assisted Mobility** Alyssa Schnorenberg *University of Wisconsin Milwaukee*
11:30 AM	**Demonstrating Continuous Improvement In Teaching And Learning: How To Document Your Work In The Classroom For Tenure And Promotion** Michelle Sabick *Saint Louis University* **Effects Of Image-Based And Text-Based Exercises On Student Learning** M. Melissa Gross, Anne Greenberg, Mary Wright, Olivia Anderson *University of Michigan, Ann Arbor*	**Racial Differences In Patterns Of Osteoarthritis: Data From The Johnston County Osteoarthritis Project** Amanda Nelson *University of North Carolina at Chapel Hill* **Racial Differences In Osteoarthritis Pain, Function, And Response To Behavioral Interventions** Kelli Allen *University of North Carolina at Chapel Hill* **Racial Differences In Foot Disorders, Structure, And Function: The Johnston County Osteoarthritis Project** Yvonne Golightly *University of North Carolina at Chapel Hill*	**Isokinetic Hip Muscle Strength Tests: Standing Versus Lying Down Repeatability** Carley Fuller, Jonathan Rylander *Baylor University*	**Method For Assessing Hip Circumduction In Persons With Multiple Sclerosis While Wearing A Portable Powered Ankle Foot Orthosis** Emily Matijevich, Morgan Boes, Matt Petrucci, Elizabeth Hsiao-Wecksler *University of Illinois at Urbana-Champaign*	**Posture And Grip Force Affect Median Nerve Morphology** Jeffrey Cowley, Joshua Leonardis, David Lipps, Deanna Gates *University of Michigan*
11:45 AM	**Creating Assignments That Excite And Empower Students: The Sports Biomechanics Video Presentation** Kimberly Bigelow *University of Dayton*		**Sagittal Plane Joint Loading During Gait Is Associated With Hip Joint Abnormalities In Femoroacetabular Impingement Patients** Michael Samaan, Benedikt Schwaiger, Matthew Gallo, Thomas Link, Alan Zhang, Sharmila Majumdar, Richard Souza *University of California-San Francisco*	**Ankle Foot Orthosis Users Demonstrate Impaired Pelvis-Trunk Coordination During Walking** Audrey Westbrook, Elizabeth Russell Esposito, Christopher Rabago, Riley *Center for the Intrepid*	**Open-Source 3D-Printed Hand Orthoses For Individuals With Spinal Cord Injury** Alexandra Portnova, Gaurav Mukherjee, Keshia Peters, Ann Yamane, Katherine Steele *University of Washington*
12:00 PM	**The New Asb Teaching Repository: Your Go To Place For Biomechanics Teaching Ideas** Cecile Smeesters, Kimberly Bigelow *Universite de Sherbrooke*		**Lowering Eye Height To Increase Knee And Hip Flexion During Landing** Boyi Dai, Taylour Hinshaw, Tyler Trumble, Mara Cosgrove, Chaoyi Wang, Qin Zhu *University of Wyoming*	**Sensitivity Of Subject Specific Gait Simulation Results To Estimates Of Ankle Foot Orthosis Mechanical Properties** Amy Hegarty, Anthony Petrella, Max Kurz, Anne Silverman *Colorado School of Mines*	**Pectoralis Minor Elongation In Manual Wheelchair Users With Sci** Margaret Finley, Joseph Sarver, Dave Ebaugh *Drexel University*
12:15 PM			**Neuromuscular Control During A Step-Down Task For Patients 2Years Post Hip Arthroscopy For Femoroacetabular Impingement Syndrome** Lindsey Brown, Michael P. McNally, Timothy E. Hewett, Rebecca Jackson, Stephanie Di Stasi *The Ohio State University*	**Changes In Achilles Tendon Length With Varying Ankle Foot Orthosis Stiffness** Hwan Choi, Avleen Randhawa, Keshia Peters, James Wakeling, Katherine Steele *University of Washington*	**Withdrawal Reflexes After Tendon Transfer In Quadriplegia** Carrie Peterson, Renee Theiss, Michael Bednar, Eric Perreault, Wendy Murray *Rehabilitation Institute of Chicago*

Friday, August 5, 3:45 – 5:00 PM

	Bone	Shoulder Girdle	Biomechanics And Neuromuscular Control Of Gait	Balance and Gait Training	Peering Inside The Foot And Ankle While They Work
	306A	306B	306C	305A	305B
Chair **Co-Chair**	Timothy Derrick *Iowa State University* Stacey Meardon *East Carolina University*	David Ebaugh *Drexel University* Meghan Vidt *Arizona State University*	Robert Gregor *Georgia Tech* Elizabeth Russell Esposito *Brooke Army Medical Center*	Ajit Chaudhari *Ohio State University* Rena Hale *University of Texas El Paso*	Donald Anderson *University of Iowa* Jennifer Nichols *University of Utah*
3:45 PM	**Dietary And Handedness Effects On Bone Microstructure** Julie Tevenan, Megan Mancuso, Tiffiny Butler, Joshua Johnson, Karen Troy *Worcester Polytechnic Institute*	**Determining Quantity Of Ultrasonic Sensors For Accurate Measurement Of Scapular Kinematics** Anthony Vicini, Michelle Sabick *St. Louis University*	**Effects Of Unilateral Push-Off Deficiency On Stride-To-Stride Fluctuations During Human Walking** Nikolaos Papapachatzis *Department of Biomechanics at UNO*	**Validation Of An Error Sonification Auditory Feedback Training Program** Rena Hale, Jerome Hausselle, Sandor Dorgo, Roger V. Gonzalez *The University of Texas at El Paso*	**Static Foot Posture Predicts Joint Kinetics During Walking** Jayishni Maharaj, tb d, Glen Lichtwark *The University of Queensland*
4:00 PM	**Sex Differences In Distal Tibia Bone Stress During Running** Stacey Meardon, Timothy Derrick, John Willson, Michael Baggaley, Richard Willy *East Carolina University*	**Accuracy Of A 3D-2D Imaging-Based Approach For Quantifying Shoulder Motion Using A Clinically-Available Biplane Fluoroscope** Joseph Mozingo, Mohsen Akbari-Shandiz, Dixon Magnuson, Cynthia McCollough, Kristin Zhao *Mayo Clinic*	**Accelerating While Walking Exhibits Biomechanical Plasticity With Age** Paul DeVita, Shane Rabideau, Patrick Rider, Deniqua Nelson, Sidney Chadwick, John Willson *East Carolina University*	**Short And Longer-Term Retention After Fractal Gait Training** Chanel LoJacono, Logan Frame, Christopher Rhea *University of North Carolina at Greensboro*	**Subject-Specific Ankle Models: Can They Predict Tibiotalar And Subtalar Joint Angles Measured In Vivo Using Dual-Fluoroscopy?** Jennifer Nichols, Koren Roach, Niccolo Fiorentino, Andrew Anderson *University of Utah*
4:15 PM	**Clinical Fractures Of The Tibial Plateau Involve Similar Energies As The Tibial Pilon** Kevin Dibbern, Laurence Kempton, Thomas Higgins, Todd McKinley, J. Lawrence Marsh, Donald Anderson *University of Iowa*	**Real-Time Forward-Dynamics Tracking Simulation With Joint Stability Constraints** Ian Stavness, Benedikt Sagl, Jory Cooper, Clark Dickerson *University of Saskatchewan*	**Biofeedback Decouples The Effects Of Speed And Propulsive Force On Joint Power Generation In Walking** Michael Browne, Jason Franz *University of North Carolina at Chapel Hill & North Carolina State University*	**Error Augmentation Feedback For Lateral Weight Shifting** Kevin O'Brien, James Schmiedeler *University of Notre Dame*	**Ultrasonic Imaging Of In Vivo Achilles Tendon Stress During Walking** Jack Martin, Emily Keuler, James Hermus, Mikel Stiffler, Matthew Allen, Darryl Thelen *University of Wisconsin-Madison*
4:30 PM	**Cancellous Bone Strength And Stiffness In Health And Osteoporosis: A 3D Printed Model** Arielle Black, Meir Barak *Winthrop University*	**Three-Dimensional Glenohumeral Joint Kinematic Analyses From Asynchronous Biplane Fluoroscopy Using An Interpolation Technique** Mohsen Akbari-Shandiz, Joseph Mozingo, David Holmes, Kristin Zhao *Mayo Clinic, Rochester, MN*	**Frontal Plane Stepping Control And Lateral Balance In Human Walking** Jonathan Dingwell, Joseph Cusumano, Jonathan Rylander, Jason Wilken *University of Texas at Austin*	**Velocity-Based Sensory Augmentation Via Fingertip Skin Stretch On Quiet Standing** Yi-Tsen Pan, Pilwon Hur *Texas A&M University*	**Quantifying Achilles Tendon Force In Vivo From Ultrasound Images** Taylor Dick, Allison Arnold, James Wakeling *Simon Fraser University*
4:45 PM	**Cervical Spine Bone Density In Young Healthy Adults As A Function Of Sex, Vertebral Level And Anatomic Location** William Anderst, Tyler West, William Donaldson, Joon Lee *University of Pittsburgh*	**Relationship Between Force Sense And Joint Position Sense At The Shoulder** David Phillips, Andrew Karduna *University of Oregon*	**Texting While Walking: The Obstacle Coming At You Is Equally Important** Preeti Chopra, Darla Castelli, Jonathan Dingwell *University of Texas at Austin*	**Gait And Balance Training Improves Gait Variability In Old Adults** Carrie Francis, Jason Franz, Samuel Acuna, Darryl Thelen *University of Wisconsin-Madison*	**Aging Effects On The In Vivo Achilles Tendon Moment Arm During Walking** Kristen Rasske, Darryl Thelen, Jason Franz *University of Wisconsin- Madison*