The Program for the Fourth North American Congress on Biomechanics

The Thirty Second Annual Conference of the American Society of Biomechanics

and

The Fifteenth Biennial Conference of the Canadian Society for Biomechanics / Société Canadienne de Biomécanique

Published by the Organizing Commitee

J.A. Ashton-Miller, R.E. Hughes, D.M. Andrews

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The Program for the Fourth North American Congress on Biomechanics

The joint meeting of

The 32nd Annual Conference of the American Society of Biomechanics (ASB)

and

The 15th Biennial Conference of the Canadian Society for Biomechanics (CSB)/

Société Canadienne de Biomécanique (SCB)

Ann Arbor, Michigan, USA

Published by the Organizing Committee, July 2008
J.A. Ashton-Miller, R.E. Hughes, D. Andrews

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LIST AND LOCATION OF EXHIBITORS

All Exhibits are on the second floor of the Michigan League, Central Campus, University of Michigan, Ann Arbor

Company	Representative	Address	Booth	Room
AMTI	Bruce White	Waltham, MA, U.S.A.	6	Ballroom
GAITRite	Michael Rowling	Havertown, PA, U.S.A.	7	Ballroom
Anybody Technology	Arne Kiis	Aalborg Oest, Denmark	20	Vandenberg
Bertec Corporation	Jeff Sobotka	Columbus, OH, U.S.A.	13	Hussey
Bio Logic Engineering	Neil, Chuck, Walt Cole	Dexter, MI, U.S.A.	8	Ballroom
C-Motion, Inc	John Kiser	Germantown, MD, U.S.A.	19	Vandenberg
Cleveland Medical Devices, Inc.	Maureen Phillips	Cleveland, OH, U.S.A.	23	Ballroom
Delsys Inc	Devi Bheemappa	Boston, MA, U.S.A.	11	Hussey
Elsevier/Saunders/Mosby	Tom Vokal	Washington, MI, U.S.A.	3	Ballroom
Human Kinetics	Loarn Robertson	Champaign, IL, U.S.A.	21	Vandenberg
Innovative Sports Training, Inc	Mona Bhuta	Chicago, IL, U.S.A.	4	Ballroom
Innovision Systems, Inc.	Victoria Berger	Columbiaville, MI, U.S.A.	18	Vandenberg
Kistler Instrument Corp	Paul Bussman	Amherst, NY, U.S.A.	9	Ballroom
Materialise, Inc.	Michael Lawrenchuck	Ann Arbor, MI, U.S.A.	12	Hussey
Motion Analysis, In.	Phil Hagerman	Santa Rosa, CA, U.S.A.	10	Ballroom
Motion Lab Systems	Chris LeBlanc	Baton Rouge, LA, U.S.A.	15	Hussey
Noraxon U.S.A., Inc	Todd Shewman	Scottsdale, AZ, U.S.A.	1	Ballroom
Northern Digital, Inc	Bob Bordignon	Waterloo, ON, CANADA	5	Ballroom
Novel Electronics	Maria Pasquale	St. Paul, MN, U.S.A.	14	Hussey
PhoeniX Technologies	Prasad Nair	Burnaby, BC, Canada	24	Ballroom
Qualisys, Inc.	Daniel India	Charlotte, NC, U.S.A.	17	Vandenberg
Tekscan, Inc.	John Guarino	South Boston, MA, U.S.A.	2	Ballroom
The Mathworks	Etham Woodruff	Natick, MA, U.S.A.	22	Vandenberg
Vicon, Inc.	George Miller	Centennial, CO, U.S.A.	16	Hussey

ACKNOWLEDGEMENTS

The Organizing Committee of the Fourth North American Congress on Biomechanics acknowledges the generous support of the following institutions, colleges, schools, departments, centers and laboratories:

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University of Windsor

University of Windsor Faculty of Human Kinetics
VP Research at the University of Windsor

The American Society of Biomechanics

The Canadian Society for Biomechanics

The International Society of Biomechanics

National Institute of Biomedical Imaging and Bioengineering (via an R13 grant to support the attendance of for minority and women students)

Thanks to the following individuals for giving of their time and expertise

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Borelli & Hay Awards: Tom Brown ▪ Irene Davis ▪ Rodger Kram ▪ Bill Marras ▪ Ron Zernicke
Post-Doctoral Scientist Award: Melissa Gross ▪ Ted Gross ▪ Mont Hubbard ▪ Maury Nussbaum ▪ A Joseph Threlkeld
Pre-Doctoral Scientist Award: Joan Bechtold ▪ Jesus Dapena ▪ Mark Grabiner ▪ Rick Lieber ▪ Mark Redfern
Journal of Biomechanics Award Finalists: Tom Buchanan ▪ Frank Buczek ▪ Raki Cham (Finalists) ▪ Max Donelan ▪ David Gabriel (Initial Screening) ▪ Phil Martin
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NACOB Tutorials: Kai-Nan An ▪ Qingshan (Frank) Chen ▪ Zachary J. Domire ▪ Scott Delp ▪ Steve Goldstein ▪ Art Kuo ▪ Mark Redfern ▪ David Vaillancourt ▪ Ron Zernicke

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Tuesday, August 5, 2008

< 8:00 am	**Registration (Michigan League Building)**	
8:15 – 8:45 am	**Bus From Michigan League to Computer Science Engineering (CSE) on North Campus**	
	Tutorials	**Lab Tours**
8:45 – 10:15 am	**I:** Arthur Kuo **Location:** Computer Science Engineering (CSE 1690) **Dynamic Walking: Analytical and Computational Methods** **II:** Scott Delp **Location:** Computer Science Engineering (CSE 1670) **OpenSim Workshop**	**Lab Tours I** **(Details on Website)**
10:45 – 12:30 pm	**I:** Arthur Kuo **Location:** Computer Science Engineering (CSE 1690) **Dynamic Walking: Analytical and Computational Methods** **II:** Scott Delp **Location:** Computer Science Engineering (CSE 1670) **OpenSim Workshop**	**Lab Tours II** **(Details on Website)**
1:30 – 3:00 pm	**I:** Arthur Kuo **Location:** Computer Science Engineering (CSE 1690) **Dynamic Walking: Analytical and Computational Methods** **III:** Kai-Nan (Andy) An, Qingshan (Frank) Chen, Zachary J. Domire **Location:** Modern Languages Building (MLB 1200 Auditorium 3) **MR Elastography and its Applications on Characterization of Skeletal Muscle** **IV:** David Vaillancourt **Location**: Rackham Ampitheatre (Rackham Building, 4th floor) **Structural and Functional Neuroimaging in Humans**	**Lab Tours III** **(Details on Website)**
3:30 – 5:00 pm	**I:** Arthur Kuo **Location:** Computer Science Engineering (CSE 1690) **Dynamic Walking: Analytical and Computational Methods** **V:** Ron Zernicke **Location:** Modern Languages Building (MLB 1200 Auditorium 3) **Successful Grant Writing in Canada** **VI:** Mark Redfern and Steve Goldstein **Location**: Kraus Natural Science Building Auditorium, Room 2140 **Successful Grant Writing in the USA**	**Lab Tours IV** **(Details on Website)**

5:30 - 7:00 pm: Opening Reception and Vendor Exhibits (Michigan League)
7:00 - 8:30: ASB and CSB Executive Board Meetings (Zanzibar Restaurant)

Wednesday, August 6, 2008

< 8:00 am **Coffee at Vendor Exhibits (Michigan League)**

8:00 **Keynote Lecture I**
Location: Rackham Auditorium

On the Challenge of Vaginal Birth
John O.L. DeLancey, M.D.
University of Michigan

9:00 **Coffee at Vendor Exhibits (Michigan League)**

9:15 **Borelli Award Lecture (ASB)**
Location: Rackham Auditorium

Why Bones Bend but Don't Break: What Cement Lines, Floyd Landis and Laundry Detergent Have in Common
David B. Burr
Indiana University

10:15 **Coffee at Vendor Exhibits (Michigan League)**

10:45 **ASB Awards Session**
Location: Rackham Auditorium

10:45 Young Scientist Pre-Doctoral Award Winner
Post-Hibernation Black Bears (Ursus Americanus) do not Demonstrate Cortical Bone Loss Compared to Pre-Hibernation Bears Despite 6 Months of Disuse (#10)
Meghan McGee
Michigan Technological University

11:00 Young Scientist Post-Doctoral Award Winner
Architectural and In Vivo Analyses Demonstrate the Unique Stabilizing Function of the Lumbar Multifidus Muscle (#582)
Sam Ward
University of California-San Diego

11:15 Clinical Biomechanics Award Finalists
Effect of Hip Protectors and Body Mass Index on Pressure Distribution During a Fall on the Hip (#573)
Woochol Joseph Choi
Simon Fraser University

11:30 **Co-Activation Differences in Lower Limb Muscles Between Asymptomatic Controls and Those with Varying Degrees of Knee Osteoarthritis During Walking** (#388)
Cheryl Hubley-Kozey
Dalhousie University

11:45 Journal of Biomechanics Award Finalists
A 3-D Finite Element Model of Anterior Vaginal Wall Support for Evaluating Mechanisms Underlying Cystocele Formation (#497)
Luyun Chen
University of Michigan

12:00 **Kinematics of a Walking Spinal Cord: Insights from a Novel Isolated Spinal Cord-Hindlimb Preparation** (#330)
Heather Hayes
Georgia Tech/Emory University

12:15 - 1:30 pm: Box Lunch at Vendor Exhibit (Michigan League)
Women in Biomechanics Lunch (Rackham Assembly Hall, 4th Floor)

NOTES

Wednesday, August 6, 2008

Scientific Sessions

Automobile Safety (ASB/CSB Symposium)

Wednesday, August 6: 1:30 - 3:00 pm
Location: MLB 1200 AUD 3
Session chair: Larry Schneider

Protection for Elderly Occupants

Effects of Occupant Age on Injury Outcome in Motor-Vehicle Crashes
Jonathan Rupp
University of Michigan Transportation Research Institute

Fragility, Frailty, and the Biomechanics of Aging
Richard Kent
University of Virginia

Evaluating Occupant Protection for Elderly Rear-Seat Passengers in Frontal Crash Testing
Suzanne Tylko
Transport Canada

Belt Donning and Belt Fit for Elderly Drivers
Matthew Reed or Stephanie Huang
University of Michigan Transportation Research Institute

Motor Control I (Podium Session 1)

Wednesday, August 6: 1:30 - 3:00 pm
Location: MLB 1400 AUD 4
Session chairs: Stephen Scott, Scott Selbie

1:30 **Stability of Multi-Finger Prehension Synergy: Exploration With Transcranial Magnetic Stimulation** (#326)
Xun Niu, Vladimir Zatsiorsky & Mark Latash
The Pennsylvania State University

1:45 **Flexible Representations of Dynamics are Used in Object Manipulation** (#561)
Alaa Ahmed, Daniel Wolpert & Randall Flanagan
University of Cambridge

2:00 **Altered Reflex Modulation to Changes in Mechanical Environment Following Stroke** (#484)
Randy Trumbower, James Finley, Jonathan Shemmell & Eric Perreault
Northwestern University & Rehabilitation Institute of Chicago

2:15 ***Deterioration of Kinematic and Muscle Performance and Associated Cortical Activity Related to Increased Shoulder Abduction Drive in Chronic Hemiparetic Stroke** (#252)
Albert Chen, Jun Yao, Ana Maria Acosta & Julius Dewald
Northwestern University

*Delsys Award Finalist

2:30 **A New Methodology for the Assessment of Movement Repeatability in Functional Upper Limb Tasks** (#97)
Sibylle Thies, Phil Tresadern, Laurence Kenney, Dave Howard & Yannis Goulermas
University of Salford, Centre for Rehabilitation and Human Performance Research

2:45 **Synergies Hierarchies During Accurate Rotations Tasks** (#451)
Wei Zhang, Vladimir Zatsiorsky & Mark Latash
The Pennsylvania State University

3:00 - 3:30 pm: Coffee at Vendor Exhibits (Michigan League)

Wednesday, August 6, 2008

Scientific Sessions

Methods/Instrumentation I (Podium Session 2)

Wednesday, August 6: 1:30 - 3:00 pm
Location: Rackham Amphitheatre
Session chairs: Jim Dickey, Tom Jenkyn

1:30 **Development of a Fiber-Optic Force Sensing Glove to Provide Clinical BiomechanicsMeasurements** (#527)
David Nuckley, David Linders & Wei-chih Wang
University of Minnesota

1:45 **Dynamic Pressure Mapping of the Head-Helmet Interface** (#208)
Ryan Ouckama & David Pearsall
McGill University

2:00 **Development and Validation of a Versatile Intra-Articular Pressure Sensing Array** (#540)
Judson Welcher, John Popovich, Thomas Hedman & Wafa Tawackoli
University of Southern California-Los Angeles

2:15 **Ground Reaction Forces During Running Can be Estimated From Insole Pressure Measurements by Considering Whole Body Dynamics** (#27)
Elizabeth Chumanov, Christian Remy & Darryl Thelen
University of Wisconsin-Madison

2:30 **A Technique for Optimizing the Center of Pressure and Kinetic Data Obtained From a Split-Belt Instrumented Treadmill** (#117)
Saryn Goldberg, Thomas Kepple & Steven Stanhope
Hofstra University

2:45 **Virtual Forceplate: Predicting Ground Reaction Forces During Single Leg Hopping Using Only Kinematic Measurements** (#218)
Alison Sheets, Stefano Corazza & Thomas Andriacchi
Stanford University

Knee I (Podium Session 3)

Wednesday, August 6: 1:30 - 3:00 pm
Location: Mendelsohn Theatre
Session chairs: Kevin Deluzio, Katherine Boyer

1:30 **Biomechanical Modeling to Predict the Risk of Developing Painful Knee OA** (#130)
Krishna Iyer, Donald Anderson, Jennifer Baker, James Torner, Thomas Brown & Neil Segal
University of Iowa

1:45 **Mechanisms Underlying Reductions in Knee Extension Strength in Knee Osteoarthritis** (#43)
Tamika Heiden, David Lloyd & Tim Ackland
University of Western Australia

2:00 **Knee-Joint Loading Variability During Gait Does Not Differ Between Individuals With and Without Knee Osteoarthritis** (#245)
Todd Royer, Jeremy Crenshaw, Joaquin Barrios & Irene Davis
University of Delaware

2:15 **Tibiofemoral Contact Pressures and Osteochondral Microtrauma From ACL Rupture via Hyperextension and Joint Compression** (#231)
Eric Meyer, Timothy Baumer & Roger Haut
Michigan State University

2:30 **An Innovative Method to Analyze the Chondrocyte Response to Mechanical Injury Both Temporally and Spatially** (#123)
Daniel McCabe, Nicholas Stroud, Douglas Pedersen & James Martin
University of Iowa

2:45 **Walking Exercise Differently Alters the Metabolic Activity of Bone in the Knee Measured With 18F-Fluoride PET/CT Between Healthy and Osteoarthritic Knees** (#246)
Seungbum Koo, Andrew Quon, David Clark, Garry Gold & Thomas Andriacchi
Stanford University

3:00 - 3:30 pm: Coffee at Vendor Exhibits (Michigan League)

Wednesday, August 6, 2008

Scientific Sessions

Spine I (Podium Session 4)

Wednesday, August 6: 3:30 - 5:00 pm
Location: MLB 1200 AUD 3
Session chairs: Kermit Davis, John Kozey

3:30 **Comparing Uniaxial and Biaxial Strain Responses of the Porcine Annulus Fibrosus** (#405)
Diane Gregory & Jack Callaghan
University of Waterloo

3:45 **A Finite Element Study of the Effect of Cross-Shear on Wear of the Prodisc Total Disc Replacement** (#72)
Curt Goreham-Voss & Thomas Brown
University of Iowa

4:00 **In Vivo Compressive Stresses in the Intervertebral Disc** (#227)
Donita Bylski-Austrow, David Glos, Frank Sauser, Alvin Crawford & Eric Wall
Cincinnati Children's Hospital Medical Center

4:15 **Biomechanical Analysis of the Lumbar Spine on the Facet Joint Force and Intradiscal Pressure: A Realistic Finite Element Study** (#343)
Hsuan-Teh Hu, Ruey-Mo Lin, Ching-Sung Kuo, Po-Chun Lin, Zheng-Cheng Zhong, Mu-Lin Hsieh & Kuo-Yuan Huang
National Cheng Kung University

4:30 **Implementation of Facet Joints in a Detailed Musculoskeletal Lumbar Spine Model Based on Inverse Dynamics** (#352)
Mark de Zee, Peter Mikkelsen, Christian Wong & Erik B. Simonsen
Aalborg University

4:45 **The Use of Artificial Neural Networks as a Data Reduction Approach In Determining Cumulative Exposures** (#331)
Robert Parkinson & Jack Callaghan
University of Waterloo

Aging I (Podium Session 6)

Wednesday, August 6: 3:30 - 5:00 pm
Location: MLB 1400 AUD 4
Session chairs: Jonathan Dingwell, Mike Pavol

3:30 **The Challenge of Monitoring Activity Level in the Elderly** (#590)
Jonathan Rylander, Katherine Boyer, Thomas Andriacchi & Gary Beaupre
VA Palo Alto

3:45 **Physical Activity for Maintaining Healthy Bone Denisty With Aging** (#142)
Katherine Boyer, Jonathan Rylander, B. Jenny Kiratli, Tom Andriacchi & Gary Beaupre
Stanford University

4:00 **On the Predicted Buckling Behavior of the Human Upper Extremity Under Impulsive End-Loading: Age and Gender Effects** (#136)
Yunju Lee & James Ashton-Miller
University of Michigan

4:15 **Age-Associated Dopaminergic Influences on Foot-Tapping and Temporal Gait Parameters in Healthy Older Adults** (#372)
Chris Bogan, Nicolaas Bohnen, Robert Koeppe, K. Frey, Roger Albin & Martijn Muller
University of Michigan

4:30 **Age Related Changes in Postural Muscle Responses With Increasing Perturbations to the Upper Back** (#448)
Luis Rosado, Christopher Hasson, Richard Van Emmerik & Graham Caldwell
University of Massachusetts Amherst

4:45 **Strategies for Balance Maintenance During Sit-to-Stand Movement in Elderly People** (#19)
Masahiro Fujimoto, Shintaro Beppu, Kazuya Okubo, Toru Fujii & Li-Shan Chou
University of Oregon

5:00 - 7:00 pm: Poster Session I and Vendor Exhibits (Michigan League)
6:30 - 8:00 pm: ISB Student Travel Grants Session (Rackham Assembly Hall, 4th Floor)
7:00 - later: Night on the Town (Buses Circulate Between Campus Downtown and Hotels)

Wednesday, August 6, 2008

Scientific Sessions

Bone (Podium Session 7)

Wednesday, August 6: 3:30 - 5:00 pm
Location: Rackham Amphitheatre
Session chairs: Ron Zernicke, Gregory Wohl

3:30 **Ultrastructural Disorder in D_2O-Equilibrated Bone Tissue Studied by Polarized Raman Spectroscopy-Implications for Biomechanics** (#474)
Mekhala Raghavan, Michael Morris, Nadder Sahar & David Kohn
University of Michigan

3:45 **Femur Bone Mass and Bone Geometry After Spinal Cord Injury** (#512)
Gail Forrest, Thomas Beck, Chris Cirnigliaro, Arvind Ramanujam, Steven Kirshblum, William Bauman, John Mores & Susan Harkema
Koessler Medical Rehabilitation Research and Education Center

4:00 **Structural Properties of Trabecular Cores from Femoral Heads** (#455)
Sylvana Garcia-Rodriguez, Meghan Crookshank, Norma MacIntyre, Mark Harrison, Everett Smith, Rick Sellens & Heide-Lynn Ploeg
University of Wisconsin-Madison

4:15 **Dietary Effects on Bone Mechanical Properties and Molecular Markers** (#203)
Caeley Lorincz, Raylene Reimer & Ronald Zernicke
University of Calgary

4:30 **Determination of Calcaneal Bone Strain During Simulated Walking With Cadaver Legs** (#288)
Lawrence Noble, Dong-gil Lee, Robb Colbrunn, Ton van den Bogert, Peter Cavanagh & Brian Davis
Cleveland Clinic Foundation

4:45 **The Effect of Varying the Density-Modulus Relationship Used to Apply Material Properties in a Finite Element Model of the Distal Ulna** (#66)
Rebecca Austman, Jaques Milner, David Holdsworth & Cynthia Dunning
The University of Western Ontario

Sport I (Podium Session 5)

Wednesday, August 6: 3:30 - 5:00 pm
Location: Mendelsohn Theatre
Session chairs: Robin Queen, Thorsten Sterzing

3:30 **Football Playing Surface Components May Affect Lower Extremity Injury Risk** (#37)
Mark Villwock, Eric Meyer, John Powell, Amy Fouty & Roger Haut
Michigan State University

3:45 **Effects of Gender on Kinematics of the Hip, Knee, and Ankle in Unanticipated Droplandings of Adolescent Soccer Players** (#299)
Michelle Sabick, Seth Kuhlman, Ronald Pfeiffer, Benjamin Cooper, David Clark & Kevin Shea
Boise State University

4:00 **Comparison of Landing Biomechanics Between Male and Female Professional Dancers** (#36)
Karl Orishimo, Ian Kremenic, Marijeanne Liederbach, Evangelos Pappas & Marshall Hagins
Nicholas Institute of Sports Medicine and Athletic Trauma

4:15 **Determination of the Optimal Seat Position That Maximizes Average Crank Power: A Theoretical Study** (#485)
Jeffery Rankin & Richard Neptune
The University of Texas at Austin

4:30 **Predictors of Scoring Accuracy: Ice Hockey Wrist Shot Mechanics** (#54)
Yannick Paquette, David Pearsall, Rene Turcotte & Ken Covo
McGill University

4:45 **Sources of Forward Ball Velocity in a Pitched Baseball** (#86)
Gordon Alderink, Thomas Kepple, Karen Lohmann Siegel, Alexander Razzook & Steven Stanhope
Grand Valley State University

5:00 - 7:00 pm: Poster Session I and Vendor Exhibits (Michigan League)
6:30 - 8:00 pm: ISB Student Travel Grants Session (Rackham Assembly Hall, 4th Floor)
7:00 - later: Night on the Town (Buses Circulate Between Campus Downtown and Hotels)

Wednesday, August 6, 2008

Poster Session I

Location: Michigan League
Time: 5:00 - 7:00 pm

2nd Floor

Room: Michigan Ballroom (Posters 1-74: Gait, Posture & Balance, Motor Control, Lower Extremity)

1) **The Impact of Medial Plantar Flexor Dysfunction on Mid Foot Joint Pressures (#**114)
Dong-gil Lee, Robb Colbrunn, Antonie van den Bogert, Peter Cavanagh & Brian Davis
Cleveland Clinic Foundation, Cleveland State University

2) **Differences in Correlations of Anterior-Posterior Ground Reaction Forces With Paretic and Control Leg Gait Variables** (#222)
Carrie Peterson, Richard Neptune & Steven Kautz
University of Texas at Austin

3) **Effects of Asymmetric Ankle Plantarflexor Recruitment on Post-Stroke Walking: A 3D Simulation Study** (#183)
Ming Xiao & Jill Higginson
University of Delaware

4) **Analysis of Amputee Gait Using Center-of-Mass Velocity** (#498)
Peter Gabriel Adamczyk, Michael Orendurff, Joseph Czerniecki, Ava Segal, Hannah Sutton, Glenn Klute & Art Kuo
University of Michigan

5) **Effects of Down Syndrome on Mediolateral Motion During Walking at Different Speeds** (#442)
Stamatis Agiovlasitis, Michael Pavol, Jeffrey McCubbin & Joonkoo Yun
University of Illinois at Urbana-Champaign

6) **Objective Evaluation of Ankle Foot Orthotics for Ambulatory Function in Hemiplegic Gait** (#578)
Karen Nolan, Mathew Yarossi, Krupa Savalia, Howard Hillstrom & Elie Elovic
Koessler Medical Rehabilitation Research and Education Center

7) **Are Asymmetries in Joint Kinetics Related to Limb Dominance?** (#311)
Matthew Seeley, Brian Umberger & Robert Shapiro
Brigham Young University

8) **Dual Task Performance in a Healthy Young Adult Population: Results From a Symmetric Manipulation of Task Complexity and Articulation** (#56)
Albert Armieri, Jeffrey Holmes, Alexandrea Gow, Tanu Sharma, Sandi Spaulding, Mary Jenkins & Andrew Johnson
The University of Western Ontario

9) **Analysis of the Effects of Stilts Walking on Joint Moments in Low Extremities** (#73)
John Wu, Sharon Chiou & Christopher Pan
National Institute for Occupational Safety and Health (NIOSH)

10) **The Effect of Unloader Braces on Knee Loads During Gait** (#403)
Kristin Whitney, Ian Jones, Trevor Birmingham & Thomas Jenkyn
The University of Western Ontario

11) **Kinetic Characteristics of Barefoot Running** (#82)
Julia Freedman, Janet Dufek & John Mercer
University of Tennessee

12) **Selection of Double Support Duration in a Compliant Walking Model** (#581)
Shawn O'Connor & Arthur Kuo
University of Michigan

13) **A Robotic Cadaveric Flatfoot Simulation of Stance Phase** (#515)
Lyle Jackson, Patrick Aubin, Matthew Cowley, Bruce Sangeorzan & William Ledoux
VA Puget Sound

14) **Vertical Stiffness During the Double Support Period of Walking** (#558)
John Rebula, Shawn O'Connor & Arthur Kuo
University of Michigan

15) **Evaluation of a Human Foot Placement Model** (#223)
Matthew Millard, Derek Wight, John McPhee, Eric Kubica & David Wang
University of Waterloo

16) **Treatment Insight From Subject-Based Simulation of Crouch Gait** (#543)
Ajay Seth, May Liu, Michael Schwartz, Frank Anderson & Scott Delp
Stanford University

17) **Reducing Residual Forces and Moments in a Three-Dimensional Simulation of Running** (#535)
Samuel Hamner, Chand John, Frank Anderson, Jill Higginson & Scott Delp
Stanford University

18) **Stability and Adaptability of Passivity-Based Bipedal Locomotion With Flat Feet and Ankle Compliance** (#363)
Qining Wang, Yan Huang, Long Wang & Dongjiao Lv
Peking University

19) **Increased Inertial Forces Reduces Locomotive Stability** (#413)
Christopher Arellano, Daniel O'Connor, Melissa Scott-Pandorf, Charles Layne & Max Kurz
University of Houston

20) **Locomotor Initiation: Influence of Chronic Ankle Instability** (#433)
Chris Hass, Erik Wikstrom, Kimberly Fournier, Amruta Inamdar & Mark Bishop
University of Florida

21) **Walking Step Width During the Transition Between Level and Sloped Surfaces** (#488)
Nori Okita & Jinger Gottschall
The Pennsylvania State University

23) **Effects of Varying Surface Inclines and Suit Pressure: Implications on Space Suit Design** (#50)
Kurt Clowers, Timothy Clark, Lauren Harvill, Richard Morency & Sudhakar Rajulu
MEI Technologies, Inc, National Aeronautics and Space Administration (NASA)

24) **Increased Exposure to an Obstacle Crossing Task Decreased Toe Elevation at Obstacle Crossing, but not Estimation of Obstacle Height** (#371)
Chris Rhea, Julia Drifmeyer & Shirley Rietdyk
Purdue University

25) **Adaptations and Aftereffects of Muscle Activation Patterns and Foot Kinematics Following Passive Swing Phase Assistance** (#340)
Montakan Thajchayapong, Brian Schmit & T. George Hornby
Northwestern University

26) **Detection of Gait Imbalance Using the Extrapolated Center of Mass** (#138)
Vipul Lugade, Sue Ewers, Chu-Jui Chen, Sujitra Boonyong, Patima Silsupadol & Li-Shan Chou
University of Oregon

27) **Contribution of Joint Torque Coordination to Vertical Force Stabilization During Human Locomotion is Speed Dependent** (#440)
Jasper Yen, Arick Auyang & Young-Hui Chang
Georgia Institute of Technology

28) **Stepping Tasks That Require Greater Executive Control Induce Multiple Postural Adjustments** (#444)
Joseph Lacko, Mark Redfern, Joseph Furman & Patrick Sparto
University of Pittsburgh

29) **Effects of a Subtalar Strapped Wedge on Knee Dynamics During Gait in Younger and Older Adults** (#426)
Kristian O'Connor, Nandina Hill, Barbara Hart & Jennifer Earl
University of Wisconsin-Milwaukee

30) **Implications of Alternate Stair Descent Strategies on Knee Biomechanics: Backwards Descent is Less Demanding** (#278)
Tyler Cluff & D. Gordon Robertson
University of Ottawa

31) **A Parametric Approach for Estimating a Range of Physiological Tibiofemoral Contact Force During Gait** (#589)
Sean Scanlan, Darryl D'Lima, Clifford Colwell & Thomas Andriacchi
Stanford University

32) **The Relationship Between Hip and Knee Kinematics to the Knee Adduction Moment in Asymptomatic Individuals With Genu Varum** (#119)
Joaquin Barrios & Irene Davis
University of Delaware

33) **Disease Severity Influences Patient Response to Variable-Stiffness Walking Shoe After One Year of Wear** (#32)
Jennifer Erhart, Nicholas Giori & Thomas Andriacchi
Stanford University

34) **Angular Momentum Primitives as Gait Invariants** (#244)
Bradford Bennett, Shawn Russell & Mark Abel
University of Virginia

35) **Induced Lower Extremity Vascular Occlusion Affects Gait Variability** (#197)
Sara Myers, Iraklis Pipinos, Jason Johanning & Nick Stergiou
University of Nebraska at Omaha

36) **Gait Variability is Reduced by Sub-Threshold Vibrations to the Feet** (#270)
Hyun Gu Kang, Andrew Galica, Attila Priplata, Olga Starobinets, Susan D'Andrea, James Collins & Lewis Lipsitz
Hebrew SeniorLife, Harvard Medical School

37) **Effects of Walking Speed on Step Width and Step Length Variability** (#276)
Daniel Peterson & Philip Martin
Pennsylvania State University

38) **The Effect of Stride-Length Changes on Triceps Surae Excitation During Walking** (#120)
David Sanderson, Ryan Cawsey, Scott Apperely & Julia Wilkes
University of British Columbia

39) **Maximum Allowable Force on a Safety Harness Cable to Discriminate a Successful From a Failed Balance Recovery** (#490)
Marc-Andre Cyr & Cecile Smeesters
Universite de Sherbrooke

40) **Correlation Between Postural Sway During Quiet Standing and Balance Recovery After Small Perturbations** (#84)
Sara Matrangola, Michael Madigan, Bradley Davidson & Maury Nussbaum
Virginia Polytechnic Institute and State University

41) **Effects of Obesity on Balance in Response to Small Postural Perturbations** (#264)
Emily Miller, Michael Madigan & Sara Matrangola
Virginia Polytechnic Institute and State University

42) **The Effects of Reflex Delays on Postural Control During Unstable Seated Balance** (#262)
N. Peter Reeves, Jacek Cholewicki & Kumpati Narendra
Michigan State University

43) **Postural Control During Quiet Standing in Patients With a Total Hip Arthroplasty or a Hip Resurfacing** (#416)
Vicky Bouffard, Marc Therrien, Martin Lavigne, Pascal-Andre Venditolli & Francois Prince
Marie Enfant Rehabilitation Centre, University of Montreal, Maisoneuve-Rosemont Hospital

44) **Effect of Proprioceptive and Visual Perturbations on Postural Control About the Vertical Axis in Quiet Standing** (#361)
Marlene Beaulieu, Martin Simoneau, Georges Dalleau, Charles-Hilaire Rivard & Paul Allard
Universite de Montreal,Sainte-Justine Hospital

45) **Effects of Lumbar Extensor Fatigue on Postural Control Assessed With Fractal Analysis** (#79)
Sunwook Kim, Maury Nussbaum & Michael Madigan
Virginia Tech University

46) **Performance Measures That Influence the Most the Ability to Recover Balance to Avoid a Fall** (#495)
Alessandro Telonio & Cecile Smeesters
Universite de Sherbrooke

47) **The Role of Knee Extensor Strength in Landing Phase Characteristics of a Balance-Restoring Step Response** (#192)
Gregory King & Carl Luchies
University of Missouri-Kansas City

48) **Trip-Recovery Strategies of a Transfemoral Amputee** (#257)
Jeremy Crenshaw, Kenton Kaufman & Mark Grabiner
University of Illinois at Chicago

49) **Gait and Balance Comparisons Between Leather and Rubber Boots in Professional Firefighters** (#379)
Chip Wade, Ryan Garten, Scott Breloff & Ed Acevedo
Auburn University

50) **The Acute Effects of Chronic Trekking Pole Use on Static and Dynamic Balance** (#113)
Julianne Abendroth-Smith, Victoria Swigart & Michael Bohne
Willamette University

51) **The Influence of Height and Edge Proximity on Balance and Reaction Time** (#526)
Wendi Weimar, John Garner, Brian Campbell & Paul St. Onge
Auburn University

52) **Dynamical Models of Repeated Goal-Directed Movements** (#410)
Joby John & Joseph Cusumano
The Pennsylvania State University

53) **Inverse Piano Technique for Studying Finger Interaction During Pressing Tasks** (#90)
Joel Martin, Mark Latash & Vladimir Zatsiorsky
The Pennsylvania State University

54) **Grasping Force Magnitude Affects the Force Sharing Pattern in Multi-Finger Prehension** (#327)
Xun Niu, Mark Latash & Vladimir Zatsiorsky
The Pennsylvania State University

55) **Hierarchical Synergies in Bimanual Prehension** (#224)
Stacey Gorniak, Vladimir Zatsiorksy & Mark Latash
The Pennsylvania State University

56) **Grasping a Handle With Constant External Torque and Variable Load** (#194)
Jason Friedman, Mark Latash & Vladimir Zatsiorsky
The Pennsylvania State University

57) **Evidence for Goal Equivalent Control in Treadmill Walking** (#550)
Joseph Cusumano, Joby John & Jonathan Dingwell
The Pennsylvania State University

58) **Interjoint Compensation Stabilizes Leg Length and Orientation During Human Locomotion** (#191)
Arick Auyang, Jasper Yen & Young-Hui Chang
Georgia Institute of Technology

59) **Neuromechanics of Muscle Synergies During Cycling** (#205)
James Wakeling & Tamara Horn
Simon Fraser University

60) **Frequency Influences the Regularity of the Structural Variations Present in the Leg Swing Kinematics** (#445)
Vladimir Ivkovic & Max Kurz
University of Houston

61) **Flexor and Extensor Contributions to the Joint Moment During Stair Ascent for Healthy Subjects and Those With Knee OA** (#503)
Joseph Gardinier & Kurt Manal
University of Delaware

62) **The Effects of Local Vibration on a Joystick Pursuit-Task** (#398)
Joseph Soltys, John Keighley & Sara Wilson
University of Kansas

63) **ACL Reconstruction Affects Lower Extremity Energy Absorption More Than Task Diversion During One Leg Landings** (#415)
Marissa Link & Steven McCaw
Illinois State University

64) **The Effect of a Linear In-Flight Perturbation on Landing Biomechanics** (#565)
Scott Arnett, Yang-Chieh Fu, Ryan Thompson, Petur Sigurdsson & Kathy Simpson
Western Kentucky University

65) **Patellar Tendinopathy Alters the Distribution of Lower Extremity Joint Effort During Hopping** (#251)
Richard Souza, Shruti Arya, Christine Pollard, George Salem & Kornelia Kulig
University of Southern California

66) **Duration of Pronation Period During Ground Contact in Heel-to-Toe Running** (#23)
Jens Heidenfelder, Thorsten Sterzing, David Schreiter & Thomas Milani
Chemnitz University of Technology

67) **Gender Differences of 2-Point Touch Sensitivity Thresholds of the Human Foot** (#156)
Sabrina Kunde, Thorsten Sterzing & Thomas Milani
Chemnitz University of Technology

68) **The Influence of Time Interval Between Loadings on Heel Pad Properties** (#476)
Daniel Gales & John Challis
The Pennsylvania State University

69) **The Dynamic Quadriceps Angle: A Comparison of Persons With and Without Patellofemoral Pain** (#323)
Yu-Jen Chen & Christopher Powers
University of Southern California

70) **Developing a Cumulative Loading Measure for the Knee: Examining Test-Retest Reliability** (#65)
Shawn Robbins, Gareth Jones, Trevor Birmingham, Jack Callaghan & Monica Maly
University of Western Ontario

71) **A Comparison Between Two Systems for the Quantification of Lower Extremity Kinematic Gait Data** (#342)
Andrew Kraszewski, Sherry Backus, Rebecca Zifchock, Mark Lenhoff & Howard Hillstrom
Hospital for Special Surgery

72) **Computer Simulation of Internal Structural Loading: Application to Overuse Running Injuries** (#491)
Ross Miller & Joseph Hamill
University of Massachusetts-Amherst

73) **Effects of Stilts Walking on Musculoskeletal Loading in Low Extremities** (#75)
John Wu, Sharon Chiou & Christopher Pan
National Institute for Occupational Safety and Health (NIOSH)

74) **Predicting Patient Function and Joint Loading Post-Total Knee Replacement Using Muscle Activation Patterns** (#16)
Gillian Hatfield, Cheryl Hubley-Kozey & Michael Dunbar
Dalhousie University

2nd Floor

Room: Vandenberg (Posters 75-90: Lower Extremity, Methods/Instrumentation, Comparative)

75) **Biomechanical Testing of the Shear Modulating Diabetic Insoles: An Engineering Perspective** (#286)
Dan Lanctot, David Armstrong, Manish Bharara & Ryan Crews
Rosaline Franklin University of Medicine & Science

76) **Hyperspectral Imaging to Assess and Predict Diabetic Foot Ulcers** (#284)
Samantha Keevey, Brian Davis, Byron Hoogwerf, Emile Mohler, Elizabeth Medinilla, Marie Neverov, Aksone Nouvong & Kevin Schomacker
Lerner Research Institute, Cleveland Clinic

77) **Meniscal Motion During the Gait Cycle** (#591)
Nathan Netravali, Seungbum Koo, Brian Hargreaves, Nicholas Giori & Thomas Andriacchi
Stanford University

78) **Markerless Versus Marker-Based Motion Capture: A Comparison of Measured Joint Centers** (#592)
Katherine Steele, Stefano Corazza, Sean Scanlan, Alison Sheets & Thomas Andriacchi
Stanford University

79) **Validation of Walkway Slip Resistance Measurements: A Gait Based Approach** (#139)
Christopher Powers, Mark Blanchette, John Brault, Jim Flynn & Gunter Siegmund
University of Southern California

80) **Validation of Windows for Examining Kinematics of the Foot With Respect to the Shoe Using a Multi-Segmented Foot Model** (#464)
Rebecca Shultz, Trevor Birmingham & Thomas Jenkyn
The University of Western Ontario

81) **A MR-Compatible Loading Device for Dynamically Imaging Shortening and Lengthening Muscle Contractions** (#397)
Christopher Westphal, Amy Silder & Darryl Thelen
University of Wisconsin-Madison

82) **Evaluation of Footswitches to Detect Heel Contact** (#180)
Jennica Roche, Daniel Steed & Mark Redfern
University of Pittsburgh

83) **A Novel Technique to Determine Gravitational and Passive Joint Torques From Dynomometer-Measured Passive Torque Data** (#214)
Dennis Anderson, Michael Madigan & Maury Nussbaum
Virginia Polytechnic and State University

84) **Can Between-Day Kinematic Reliability be Improved?** (#104)
Brian Noehren & Irene Davis
University of Delaware

85) **Development of an Apparatus to Produce High Impact Extremity Loading With an Application in the Lower Leg** (#145)
Cheryl Quenneville, Gillian Fraser & Cynthia Dunning
The University of Western Ontario

86) **An Objective Evaluation of Segmented Foot Models Using Robotic Dynamic Activity Simulator** (#229)
Nori Okita, Steven Meyers, John Challis & Neil Sharkey
The Pennsylvania State University

87) **Three Dimensional Kinematics and Kinetics of the Center of Mass of the Cat During Walking on a Narrow Walkway** (#421)
Brad Farrell, Irina Beloozerova & Boris Prilutsky
Georgia Institute of Technology

88) **Experimental Study of the Deformation and Flexibility of Insect Wings** (#333)
Xiaolin Wang, Afzal Khan, Lingxiao Zheng & Rajat Mittal
George Washington University

89) **Inverse Dynamic Analysis of the Stifle Joint in Labrador Retrievers With Cranial Cruciate Ligament Deficiency** (#566)
Chantal Ragetly, Dominique Griffon, Jason Thomas, Ayman Mostafa & Elizabeth Hsiao-Wecksler
University of Illinois

90) **Non Invasive Determination of Body Segment Parameters in Labrador Retrievers** (#564)
Chantal Ragetly, Dominique Griffon, Jason Thomas, Ayman Mostafa, David Schaeffer, Gerald Pijanowski & Elizabeth Hsiao-Wecksler
University of Illinois

2nd Floor
Room: Hussey (Posters 91-106: Ergonomics)

91) **Comparison of Strength Between Pregnant and Non-Pregnant Women** (#216)
Genevieve Dumas, Karine Charpentier, Mei Wang & Andrew Leger
Queen's University

92) **Upper Body Posture During Tree Planting Work** (#115)
Tegan Upjohn, Peter Keir & Genevieve Dumas
Queen's University

93) **A Three-Dimensional Model to Examine the Effects of Posture on Carpal Tunnel Size and Shape** (#186)
Jeremy Mogk & Peter Keir
Rehabilitation Institute of Chicago

94) **Predicting Female Arm Strength From Hand Location** (#99)
Christopher Freeman & Jim Potvin
University of Windsor

95) **Astronaut Rotational Motion During Simulated Microgravity** (#83)
Leia Stirling, Dava Newman & Karen Willcox
Massachusetts Institute of Technology

96) **Evaluation of Physical Stress During Hand Gestures for Human Machine Interaction** (#368)
Razie Riemer, Adi Ronen, Helman Stern & Yael Edan
Ben Gurion University of the Negev

97) **Lateral Reaching From Fixed Ladders** (#291)
Justin Young, Hogene Kim, Chuck Woolley, Tom Armstrong & James Ashton-Miller
University of Michigan

98) **Hand Load Contributions to Cervical Spine Compression Forces** (#172)
Adam Pickens & Jeff Woldstad
Texas Tech University

99) **Manual Patient Transfer Training: Student Nurse Perceptions** (#127)
Paula van Wyk, David Andrews & Patricia Weir
University of Windsor

100) **Trade-Off Between Lift Rate and Box Weight: A Spine Load Perspective** (#585)
Susan Kotowski, Kermit Davis & William Marras
University of Cincinnati

101) **The Effect of Starting Location on Posture During a Fine Assembly Part Insertion Task** (#137)
Sean Abdulla & Anne Moore
York University

102) **Modeling Time Varying Moment Profiles Determined From Automotive Assembly Workers Using a First Order System Response** (#391)
Steven Fischer, Wayne Albert & Jack Callaghan
University of Waterloo

103) **Preferred Position and Associated Forces for Lower Back Support in Vehicle and Office Seating Environments** (#266)
Zahid Rampurawala & Tamara Reid-Bush
Michigan State University

104) **Children's Postural Habits While Working at Computer Workstations** (#521)
Carol Murphy, Joan Stevenson & Mohammad Abdoli
Queens University

105) **Minimising Trunk Angle Prediction Errors Associated With Field Goniometry by Utilizing a Subject Specific Calibration of Planar Leg Movements in Seated Drivers** (#106)
Robert Jack & Michele Oliver
University of Guelph

106) **Biomechanical and Physiologic Cost of Body Armor** (#583)
Leif Hasselquist, Carolyn Bensel, Brian Corner, Karen Gregorczyk & Jeffrey Schiffman
Natick Soldier Research, Development, and Engineering Center

3rd Floor

Room: Room 'D' (Posters 107-121: Computational Modeling, Injury)

107) **Differences Between Joint Work and Muscle Fiber Work During Steady-State Walking** (#108)
Kotaro Sasaki, Richard Neptune & Steven Kautz
University of Texas at Austin

108) **Independent Effects of Weight and Mass on Plantar Flexor Muscle Function: A Comparative Modeling and Simulation Study** (#469)
Craig McGowan, Rodger Kram & Richard Neptune
University of Texas at Austin

109) **A Preliminary Study on Musculoskeletal Finite Element Model With Accurate Muscle Moment Arms in Human Elbow** (#153)
Hideyuki Kimpara, Takahiko Sugiyama, Chikara Nagai, Kyuengbo Min, Yuko Nakahira & Masami Iwamoto
Toyota Central R&D Labs., Inc.

110) **Comparison of Computational and Experimental Results for Femur Fracture Risk Following Double-Bundle ACL Reconstruction** (#132)
Madelyn O'Farrell, Osmar Lopes Jr., Yonsik Yoo, Freddie Fu & Patrick Smolinski
University of Pittsburgh

111) **Development of a Semi-Automated Method for Generation of Hexahedral Femoral Cartilage Meshes From MRI** (#187)
Mark Baldwin, Joseph Langenderfer & Paul Rullkoetter
University of Denver

113) **Effect of Ageing and Arterial Stenosis on Ventricular-Arterial Coupling: A Computational Model Study** (#6)
Fuyou Liang, Shu Takagi, Ryutaro Himeno & Hao Liu
RIKEN

114) **Effect of Ankle Instability on the Load Bearing Characteristics of the Ankle-Foot Structure During Touchdown** (#260)
Jason Tak-Man Cheung, Victor Valderrabano, Scott Landry & Benno Nigg
University of Calgary

115) **Liquid Plug Dynamics in Microfluidic Flexible Channels: A Small Airway Model** (#499)
Ying Zheng, Hideki Fujioka, Yusuke Torisawa, Shuichi Takayama & James Grotberg
University of Michigan

116) **Elastic Rod Model for Protein Mediated DNA Looping** (#500)
Todd Lillian, Sachin Goyal, Edgar Meyhofer & Noel Perkins
University of Michigan

117) **Head Angular Acceleration Pulse Characteristics Affect Behavioral Outcomes Following Mild Diffuse Brain Injury** (#131)
Brian Stemper, Ronald Fijalkowski, Thomas Gennarelli, Narayan Yoganandan & Frank Pintar
Medical College of Wisconsin

118) **The Effects of Muscle Tension on Human Biomechanical Response and Perceived Impact Intensity** (#240)
Felix Tsui & Matthew Pain
Loughborough University

119) **Design of Low Stiffness Floors for Preventing Hip Fractures in High Risk Environments: Comparison of Force Attenuation and Influence on Balance** (#555)
Andrew Laing & Stephen Robinovitch
Simon Fraser University

120) **A Preliminary Study: Tracking 3D Kinematics of the Goat Knee Joint In-Vivo** (#341)
Daniel Miranda, Michael Rainbow, Beth Brainerd & Braden Fleming
Brown University

121) **Tibiofemoral Contact Pressures and Osteochondral Microtrauma During ACL Rupture Due to Excessive Compressive Loading and Internal Tibia Torsion** (#212)
Eric Meyer, Timothy Baumer & Roger Haut
Michigan State University

3rd Floor

Room: Henderson (Posters 123-146: Bone, Cartilage, Tendon/Ligament, Muscle)

123) **Numerical Model of Bone Remodelling Sensitive to Loading Frequency** (#62)
Etienne Malachanne, Franck Jourdan & David Dureisseix
University Montpellier 2

124) **Lacunocanalicular Fluid Flow and Regulation of Basic Multicellular Unit Activity** (#34)
Grant Goulet, David Cooper, Dennis Coombe, Robert Martinuzzi & Ronald Zernicke
University of Calgary

125) **Differences in Bone Morphology in Male Rats Selectively Bred for High or Low Aerobic Capacity** (#71)
Sarah Manske, Russell Hepple, Lauren Koch, Steven Britton, Steven Boyd & Ronald Zernicke
University of Calgary

126) **Effect of Treadmill Exercise in Tibiae of Ovariectomized Rats: A Biomechanical Analysis** (#217)
Patricia Bloes, Ariane Zamarioli, Antonio Shimano, Priscila Simoes, Jose Volpon, Luis Pereira & Francisco Mazzocato
University of Sao Paulo

127) **Experimental and Finite Element Investigations of the Press-Fit Fixation of a Bone Implant Interface in the Distal Femur** (#460)
Travis Burgers & Heidi Ploeg
University of Wisconsin-Madison

128) **Structural Properties of Fourth-Generation Composite Femurs and Tibias** (#12)
Anneliese Heiner
University of Iowa

129) **Achilles Tendon Injury: Predisposing Factors in Men Between 30 and 50 Years of Age** (#549)
Kathryn Antle & David Hawkins
University of California-Davis

130) **Tendinopathy Alters Mechanical Properties of the Achilles Tendon** (#481)
Shruti Arya & Kornelia Kulig
University of Southern California

131) **Mechanical Characteristics of Native Tendon Slices for Tissue Engineering Scaffold** (#308)
Ting-Wu Qin, Chun-Feng Zhao, Yu-Long Sun, Scott Steinmann, Peter Amadio & Kai-Nan An
Mayo Clinic, West China Hospital, Sichuan University

132) **Measurement of Elbow Medial Ulnar Collateral Ligament Strain: Choice of Reference Length Reduces Interspecimen Variability** (#382)
Laurel Kuxhaus, Florian Thomines, Angela Flamm, Patrick Schimoler, Mandy Brogdon, Jeffrey Vipperman, Patrick DeMeo & Mark Carl Miller
University of Pittsburgh

133) **Automated Mankin Scoring of Osteoarthritis Severity in Rabbits** (#364)
Richard Amendola, James Martin, Gail Kurriger, Farshid Moussavi-Harami, Thomas Brown & Douglas Pedersen
University of Iowa

134) **Pulling a Fast One: Mechanical Response of Articular Cartilage to High Frequency Loading** (#325)
Matt Szarko & John Bertram
University of Calgary

135) **A Technique for Calculating and Mapping Focal Cartilage Thickness** (#335)
William Anderst, Eric Thorhauer & Scott Tashman
University of Pittsburgh

136) **In-Vitro Investigation of Meniscal Movement Using Medical Imaging** (#411)
Maeghan Innes, Mark Hurtig, David Holdsworth & Karen Gordon
University of Guelph

137) **Subject-Specific Force-Length Parameters of the Ankle Plantarflexors in Young Adults** (#309)
Ross Miller, Christopher Hasson & Graham Caldwell
University of Massachusetts-Amherst

138) **Predicting Quadriceps Fatigue During Electrically Stimulated Non-Isometric Contractions** (#317)
Susan Marion, Maury Hull & Anthony Wexler
University of California-Davis

139) **Long-Term Morphological and Functional Changes Following an Acute Hamstring Strain Injury** (#406)
Amy Silder, Darryl Thelen, Michael Tuite & Bryan Heiderscheit
University of Wisconsin-Madison

140) **Force and Excursion Demands of Rotator Cuff Muscles During Abduction** (#67)
James Otis, Matthew Hansen, Jared Johnson, Frank Cordasco, Edward Craig & Russell Warren
The SHRI-CORE Biomechanics Lab

141) **An Experimental Model of Dilated Cardiomyopathy** (#574)
Audree McKenzie & Walter Herzog
University of Calgary

142) **Estimating the Appropriate Sample Size for the Determination of Optimal Fiber Length** (#437)
Benjamin Infantolino & John Challis
The Pennsylvania State University

143) **A Surface EMG Study of Healthy Jaw Function** (#414)
Steph Forrester, Matthew Pain, Andy Toy & Ron Presswood
Loughborough University

144) **Actively Generated Force and Stiffness Transmission Through Layers of the Rat Abdominal Wall** (#168)
Stephen Brown & Stuart McGill
University of Waterloo

145) **The Steps of Muscle Myosin II** (#189)
Ashi Mehta & Walter Herzog
University of Calgary

146) **Modelling the Effect of Brownian Motion on the Amount of Backwards Steps in the Classical Three-Beads Laser Trap Setup for Actin-Myosin Interaction** (#42)
Gudrun Schappacher-Tilp & Walter Herzog
University of Calgary

3rd Floor
Room: Koessler (Posters 147-166: Sport Science, Memorial Posters)

147) **The Effects of Leg Dominance on Knee Joint Kinetics During Cutting** (#302)
Szu-Ping Lee, John Chow & Mark Tillman
University of Florida, University of Southern California

148) **Quantifying the Planarity of the Field Hockey Hit** (#401)
Alexander Willmott & Jesus Dapena
Indiana University

149) **Effects of Ice Hockey Facial Protectors on Response Time** (#128)
Patrick Dowler & David Pearsall
McGill University

150) **Portable Strain Measurement System for Ice Hockey Sticks** (#418)
Patrick Magee, Phil Dixon, TJ Stidwill, David Pearsall, Rene Turcotte & Ken Covo
McGill University

151) **A Comparison Between Three Downswings for the Moy to Support and Giant on Parallel Bars in Men's Gymnastics** (#468)

Pierre Gervais, Pierre Baudin, Toshiyuki Fujihara & Tom Wu
University of Alberta

152) **Kinematic Comparison of Circles in Cross Support and Circles in Side Support** (#200)
Toshiyuki Fujihara & Pierre Gervais
University of Alberta

153) **Does Midsole Deformation Reflect Rearfoot Motion During Running? A Multiple Regression Approach to Evaluate Pronation by Hall Sensors** (#167)
Thomas Milani, Torsten Brauner, Thorsten Sterzing & Doris Oriwol
Chemnitz University of Technology

154) **Soccer Shoes Reduce Foot Sensitivity Compared to Barefoot for External Vibration Stimuli** (#29)
Thorsten Sterzing, Sabrina Kunde, Franziska Scholz & Thomas Milani
Chemnitz University of Technology

155) **Effects of Footwear on Plantar Foot Sensitivity are Frequency Dependent: A Study With Formula 1 Footwear** (#96)
Gunther Schlee, Thorsten Sterzing & Thomas Milani
Chemnitz University of Technology

156) **Different Approach Techniques in Volleyball Spike** (#171)
Claas Kuhlmann, Karen Roemer & Thomas Milani
Chemnitz University of Technology

157) **Reliability of Joint Angle Movements During Rock Climbing** (#359)
Paris Malin, Shinya Abe, Randall Jensen & Phillip Watts
Northern Michigan University

158) **Compression Apparel Effects on Soft Tissue Vibrations** (#211)
Aurel Coza & Benno Nigg
University of Calgary

159) **Tennis Serve Analysis Using on-the-field Markerless Motion Capture** (#587)
Stefano Corazza, Alison Sheets, Geoff Abrams, Marc Safran & Thomas Andriacchi
Stanford University

160) **Lower-Back Compressive Forces During Drop Landings** (#501)
Christopher Sorensen, W. Brent Edwards, Brett Sealine, Jason Gillette & Timothy Derrick
Iowa State University

161) **Comparison of Moment-Angle Profile of Elbow Flexors-Extensors in Elite Young Overhead Athletes** (#402)
Maria Elissavet Nikolaidou & Konstantinos Boudolos
National and Kapodistrian University of Athens

162) **The Influence of Rate of Muscle Activation on the Neural Adaptations to Resistance Exercise** (#482)
Clayton Peterson, Michel Ladouceur & Warren Darling
University of Iowa

163) **Muscle Activation Correlates With Vibration Intensity Measured During Alpine Skiing** (#234)
Peter Federolf, Benno Nigg, Vinzenz von Tscharner, Martin Gimpl & Erich Mueller
University of Calgary

164) **Comparison of Stopping Tasks Used to Assess ACL Injury Risk** (#467)
Mukta Joshi, Joshua Weinhandl & Kristian O'Connor
University of Wisconsin-Milwaukee

165) **Memorial Poster:** James J. Stone

166) **Memorial Poster:** Yuli Toshev

NOTES

Thursday, August 7, 2008

< 8:00 am **Coffee at Vendor Exhibits (Michigan League)**

8:00 **Keynote Lecture II**
Location: Rackham Auditorium

Locomoting in a Turbulent World
Mimi A.R. Koehl
University of California-Berkeley

9:00 **Coffee at Vendor Exhibits (Michigan League)**

9:15 **CSB Career Award**
Location: Rackham Auditorium

Biomechanicz in Three Acts
Ronald F. Zernicke
University of Michigan

10:15 **Coffee at Vendor Exhibits (Michigan League)**

10:30 **NDI New Investigator Awards Session (CSB)**
Location: Rackham Auditorium

10:30 Masters Award Finalists
Force Enhancement Reaches a Plateau at Critical Stretch Magnitudes (#523)
Brandon Hisey
University of Calgary

10:41 **Strength Training of the Quadriceps Muscles Following ACL Transection: Effects on Strength and Joint Integrity** (#35)
Eva Szabo
University of Calgary

10:52 **Changes in Passive Muscle Properties of Cerebral Palsy Patients** (#436)
Megan Yaraskavitch
University of Calgary

11:03 Doctorate Award Finalists
Mechanical Loading of In Situ Chondrocytes in Their Native Environment (#384)
Sang-Kuy Han
University of Calgary

11:14 **Shortening-Induced Force Depression is Primarily Caused by Cross-Bridges in Strongly Bound States** (#15)
Eun-Jeong Lee
University of Calgary

11:25 **Skeletal Muscle Myofibrils Fail at Different Forces but Similar Sarcomere Lengths for Active and Passive Stretching** (#250)
Tim Leonard
University of Calgary

11:36 Post Doctorate Award Finalists
Force Depression in Single Myofibrils and Sarcomeres (#89)
Venus Joumaa
University of Calgary

11:47 **Evaluation of a Dynamic Load Sharing Approach for the Lower Extremity** (#285)
Martijn Klein Horseman
University of Twente, University of Calgary

11:58 **Residual Force Enhancement in Maximal Voluntary Contractions of Human Dorsi Flexors** (#40)
Markus Tilp
University of Calgary

12:15 - 1:30 pm: Box Lunch at Vendor Exhibit (Michigan League)
CSB Annual General Meeting (MLB 1400 AUD 4)
Free Matlab Tutorial (1420 MLB)

NOTES

Thursday, August 7, 2008

Scientific Sessions

Occupational Biomechanics (CSB Symposium)

Thursday, August 7: 1:30 - 3:00 pm
Location: MLB 1200 AUD 3
Session chair: Jack Callaghan

Occupational Evaluations Using Advanced Biomechanical Models: Circumventing Workplace Barriers Through Simulation

Making Digital Human Models More 'Human': Focusing on the Shoulder
Clark Dickerson
University of Waterloo

Industrial Vehicle Design: Understanding the Interplay Between Vision, Vibration, and Posture - Simulation Can Help
Tammy Eger
Laurentian University

Can we Perform Valid Ergonomic Assessments on Automotive Assembly Tasks that Don't Even Exist Yet?
Jim Potvin
McMaster University

Bring the Lab to Work - An Examination of Data Reduction Approaches to Document Spine Loading
Robert Parkinson
University of Waterloo

Computational Modeling I (Podium Session 8)

Thursday, August 7: 1:30 - 3:00 pm
Location: MLB 1400 AUD 4
Session chairs: Michael Hahn, Ton van den Bogert

1:30 **Finite Element Modeling of Intraneural Ganglion Cysts of the Common Peroneal Nerve** (#159)
Shreehari Elangovan, Gregory Odegard, Duane Morrow & Robert Spinner
Michigan Technological University

1:45 **A Finite Element Micromechanical Model of Muscle to Explore the Role of Intramuscular Connective Tissue** (#428)
Bahar Sharafi & Silvia Blemker
University of Virginia

2:00 **Finite Element Modelling and Analysis of Custom Foot Orthotics** (#370)
Lieselle Trinidad, Sundar Krishnamurty, Ryan Chang & Joseph Hamill
University of Massachusetts-Amherst

2:15 **Simple Models of Drop Jumps: Evaluating a Model Against the Subject Specific Group of Models From Which it was Developed** (#206)
Matthew Pain & Stephanie Forrester
Loughborough University

2:30 **Determination of Subject-Specific Mechanical Properties of Individual Ankle Joint Muscles** (#548)
Christopher Hasson, Ross Miller & Graham Caldwell
University of Massachusetts-Amherst

2:45 **Subject Specific Anatomic Parameters Improve Moment Predictions of an EMG-Driven Knee Joint Model** (#305)
Liang-Ching Tsai, John Popovich, Mark Lyle & Christopher Powers
University of Southern California

3:00 - 3:30 pm: Coffee at Vendor Exhibits (Michigan League)

Thursday, August 7, 2008

Scientific Sessions

Orthopaedics I (Podium Session 9)

Thursday, August 7: 1:30 - 3:00 pm
Location: Rackham Amphitheatre
Session chairs: Michelle Sabick, Xudong Zhang

1:30 **Deformability of the Carpal Tunnel With and Without the Transverse Carpal Ligament** (#263)
Kai-Hua Xiu, Joo-Han Kim & Zong-Ming Li
University of Pittsburgh

1:45 **Comparing the Fixation of a Novel Hollow Screw Versus a Conventional Solid Screw in Human Sacra Under Cyclic Loading** (#68)
Stewart McLachlin, Brendon Beaton, Marlis Sabo, Kevin Gurr, Steward Bailey, Chris Bailey & Cynthia Dunning
The University of Western Ontario

2:00 **Influence of Posterior Cruciate Ligament Treatment on Quadriceps Demand in TKR: A Computer Simulation Study** (#522)
Michael Hast, Ryan Landon & Stephen Piazza
The Pennsylvania State University

2:15 **An In-Vivo Examination of the Effect of Femoral Tunnel Placement During ACL Reconstruction on Tibial Rotation** (#20)
Stavros Ristanis, Eleftheria Siarava, Nick Stergiou & Anastasios Georgoulis
University of Ioannina Medical Center

2:30 **An Association Between Preoperative Gait Patterns and Postoperative Total Knee Implant Migration** (#373)
David Wilson, Janie Astephen, Michael Dunbar & Kevin Deluzio
Dalhousie University, University of Cape Town

2:45 **In-Vivo Measurement of Tibiotalar Joint Motion: Accuracy Assessment and Preliminary Results** (#25)
Sukhinder Bilkhu, Stephanie Kline, Mitch Mager, Jason Davis, Richard Needleman & Michael Bey
Henry Ford Hospital

Gait I (Podium Session 10)

Thursday, August 7: 1:30 - 3:00 pm
Location: Mendelsohn Theatre
Session chairs: Scott White, Chris McGibbon

1:30 **Regulation of Mechanical Energy Generated During Walking in Healthy Children** (#393)
Brian Umberger, Sam Augsburger, JoAnne Resig, Donna Oeffinger, Robert Shapiro & Chester Tylkowski
University of Massachusetts-Amhurst

1:45 **Joint Powers but not Joint Torques Discriminate Highly Mobile and Functional Old From Young Adults** (#546)
Paul DeVita, Patrick Rider, Ben Long, Ken Steinweg, Allison Gruber, Stan Solnik & Tibor Hortobagyi
East Carolina University

2:00 **Energetics and Biomechanics of Walker Assisted Gait** (#2)
Jonathon Priebe & Rodger Kram
University of Colorado

2:15 **Elastic Energy and Optimal Stride Frequency in Running: The Effects of Uphill and Downhill** (#193)
Kristine Snyder & Claire Farley
University of Colorado

2:30 **A Comparison Between Sloped and Level Surface Gait Initiation** (#486)
Scott Breloff, Dwight Waddell & Chip Wade
University of Mississippi

2:45 **Gait Dynamics on a Cross-Slope Walking Surface** (#271)
Phil Dixon & David Pearsall
McGill University

3:00 - 3:30 pm: Coffee at Vendor Exhibits (Michigan League)

Thursday, August 7, 2008

Scientific Sessions

Ergonomics I (Podium Session 14)

Thursday, August 7: 3:30 - 5:00 pm
Location: MLB 1200 AUD 3
Session chairs: Tammy Eger, Michele Oliver

3:30 **Proactive Ergonomic Analyses With Digital Human Modeling: A Validation Study of Percent Capable Values** (#101)
Jim Potvin, James Chiang, Monica Jones, Brian McInnes & Allison Stephens
McMaster University

3:45 **Vertical Ground Reaction Forces and Center of Pressure Excursion During Two-Hand Push Exertions** (#432)
Suzanne Hoffman, Matthew Reed & Don Chaffin
General Motors

4:00 **The Effect of Drywall Stilts on the Control of Quiet Standing** (#376)
Jeremy Noble, Jonathan Singer, Kaitlin Gallagher & Stephen Prentice
University of Waterloo

4:15 **The Effectiveness and User-Acceptability of a Personal Lift Assist Device (PLAD) in Reducing Erector Spinae Demand Associated With an Automotive Assembly Task** (#190)
Ryan Graham, Joan Stevenson, Michael Agnew & Mohammad Abdoli-Eramaki
Queen's University

4:30 **Effects of the Seat Armrest and Assistive Devices on Lumbar Kinetics During Dependent Transfers on an Aircraft** (#458)
Kristof Kipp & Michael Pavol
Oregon State University

4:45 **Gender and Passive Tissue Responses to Prolonged Sitting in an Automobile Seat** (#347)
Diana De Carvalho & Jack Callaghan
University of Waterloo

Posture & Balance I (Podium Session 12)

Thursday, August 7: 3:30 - 5:00 pm
Location: MLB 1400 AUD 4
Session chairs: Shirley Rietdyk, Jeffrey Haddad

3:30 **The Effect of Parkinson's Disease on the Step Response to a Backwards Pull: Center of Pressure** (#297)
Molly McVey, Antonis Stylianou, Carl W Luchies, Michael Haines, Kelly Lyons & Rajesh Pahwa
The University of Kansas

3:45 **Repeated Exposure to Small Postural Perturbations Leads to Improvements in Balance Recovery** (#165)
Kathleen Bieryla, Bradley Davidson & Michael Madigan
Virginia Polytechnic and State University

4:00 **Loss of Complexity in Balance Dynamics During Quiet Standing and Dual-Task: A Marker of Frailty in Elderly People** (#273)
Hyun Gu Kang, Madalena Costa, Olga Starobinets, Ary Goldberger, Chung-Kang Peng, Dan Kiely, Adrienne Cupples & Lewis Lipsitz
Hebrew SeniorLife and Harvard Medical School

4:15 **Do Vestibular Inputs Trigger Upper Body Responses During a Slip?** (#387)
Kurt Beschorner, Mark Redfern, Peter Sandrian & Rakie Cham
University of Pittsburgh

4:30 **Recovery of Postural Sway After Static Stretch of the Ankle Joint** (#149)
Tomoaki Iwata, Akinori Nagano & Zhi-wei Luo
Kobe University

4:45 **The Effects of Walking Speed and Surface on Dynamic Stability in Young Adults With Unilateral Trans-Tibial Amputations** (#429)
Shawn Scott, Jonathan Dingwell & Jason Wilken
University of Texas

5:15 - 6:15 pm: Buses to Henry Ford Museum (Pick up at Michigan League South Entrance)
6:15 - 8:45 pm: Strolling Banquet: Henry Ford Museum (Dearborn)
8:45 - 10:00 pm: Buses from Henry Ford Museum to Hotels, Downtown and Central Campus

Thursday, August 7, 2008

Scientific Sessions

Muscle I (Podium Session 13)

Thursday, August 7: 3:30 - 5:00 pm
Location: Rackham Amphitheatre
Session chairs: Stephen Piazza, Silvia Salinas Blemker

3:30 **How is Sarcomere Length Affected by the Procedures for Intraoperative Measurements Using Laser Diffraction?** (#477)
Huub Maas, Jeremy Eagles, Thomas Sandercock & Wendy Murray
Northwestern University

3:45 **The Force-Length Relationship of the Cat Soleus Muscle** (#202)
Marco Aurelio Vaz, Cintia de la Rocha Freitas, Tim Leonard & Walter Herzog
Federal University of Rio Grande Do Sul

4:00 **Muscle Excursion Scales With Normalized Fiber Length in a Rabbit Model** (#336)
Taylor Winters, Mitsuhiko Takahashi, Richard Lieber & Samuel Ward
University of California-San Diego

4:15 **Deletion of Nebulin Alters the Length-Tension Properties of Neonatal Skeletal Muscle** (#18)
David Gokhin, Jianlin Zhang, Ju Chen & Richard Lieber
University of California-San Diego

4:30 **Automated Method for Tracking Change in Muscle Fascicle Length for Ultrasound Images** (#332)
Manku Rana & James Wakeling
Simon Fraser University

4:45 **Assessment of Immobilized Muscle Using MRE** (#63)
Takayuki Muraki, Zachary Domire, Qingshan Chen, Matthew Mccullough & Kai-Nan An
Mayo Clinic

Sport II (Podium Session 11)

Thursday, August 7: 3:30 - 5:00 pm
Location: Mendelsohn Theatre
Session chairs: Glenn Fleisig, Dave Fortenbaugh

3:30 **Effect of Ability on Freestyle Swimbench Stroke Characteristics** (#140)
Tracy Spigelman, Tim Uhl, David Mullineaux, Thomas Cunningham, Scott Mair & Robert Shapiro
University of Kentucky

3:45 **Timing and Velocity of Shoulder and Hip Horizontal Rotation in Novice and Skilled Golfers** (#201)
Isao Okuda, Junji Shinohara & Charles Armstrong
University of New England

4:00 **Technique Differences Among Male and Female Intermediate Hurdlers and Steeplechasers** (#242)
Laurence Bollschweiler, Iain Hunter, Brent Feland & Ty Hopkins
Brigham Young University

4:15 **Joint Coupling of the Rearfoot and Knee in Runners With Patellofemoral Pain Syndrome During a Prolonged Run** (#133)
Tracy Dierks & Irene Davis
Indiana University

4:30 **Relationship Between Mechanical, Biomechanical and Perceptual Parameters of Cushioning Properties in Running Shoes** (#152)
Julia Augustijn, Thorsten Sterzing & Thomas L. Milani
Chemnitz University of Technology

4:45 **Football Shoe Designs May Affect Lower Extremity Injury Risk** (#38)
Mark Villwock, Eric Meyer, John Powell, Amy Fouty & Roger Haut
Michigan State University

5:15 - 6:15 pm: Buses to Henry Ford Museum (Pick up at Michigan League South Entrance)
6:15 - 8:45 pm: Strolling Banquet: Henry Ford Museum (Dearborn)
8:45 - 10:00 pm: Buses from Henry Ford Museum to Hotels, Downtown and Central Campus

Friday, August 8, 2008

< 8:00 am	**Coffee at Vendor Exhibits (Michigan League)**
8:00	**Keynote Lecture III** Location: Rackham Auditorium
	The 3 Bs of Motor Control: Behavior, Brains and Biomechanics Steve Scott *Queen's University*
9:00	**Coffee at Vendor Exhibits (Michigan League)**
9:15	**Hay Award (ASB)** Location: Rackham Auditorium
	From Biomechanics to Motor Control – From 1973 to 2008 Vladimir M. Zatsiorsky *The Pennsylvania State University*
10:15 – 10:45 am	**Coffee at Vendor Exhibits (Michigan League)**

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Friday, August 8, 2008

Scientific Sessions

Aftab Patla Symposium (CSB Career Award)

Friday, August 8: 10:45 am – 12:15 pm
Location: MLB 1200 AUD 3
Session chair: Stephen Prentice

Silly Walks and Other Insights to the Control of Locomotion. Celebrating the Contribution of Aftab Patla

Just Walk Normally, Adapting to Changing Circumstances
Stephen Prentice
University of Waterloo

Compensatory Responses to Perturbations During Rhythmic Movements in Human Subjects
Marc Bélanger
Université du Québec à Montréal

Evaluating Adaptation and Avoidance in Clinical Motion: Concepts Learned From Aftab
Sandi Spaulding
The University of Western Ontario

Aftab Patla's Perspective on Stability: Four Legs Good, Two Legs Bad
Shirley Rietdyk
Purdue University

Watch Where You're Walking: How Aftab Saw Vision Guiding Locomotion
Michael Cinelli
Wilfrid Laurier University

Motor Control II (Podium Session 15)

Friday, August 8: 10:45 am – 12:15 pm
Location: MLB 1400 AUD 4
Session chairs: Jules Dewald, Albert Chen

10:45 **Neuromechanical Representations of Leg Orientation and Length Control are Preferentially Conserved After Peripheral Nerve Injury During Cat Locomotion** (#435)
Young-Hui Chang, Arick Auyang, John Scholz & Richard Nichols
Georgia Institute of Technology

11:00 **Neuromuscular Contribution of the Leg Flexor Muscles to Knee Joint Stiffness Following a Sudden Leg Perturbation** (#147)
Joel Cort & Jim Potvin
McMaster University

11:15 **Proprioceptive Sensitivity in Constrained and Unconstrained Degrees of Freedom** (#456)
Martha Cammarata & Yasin Dhaher
Northwestern University

11:30 **The Influence of Increasing Steady-State Walking Speed on Muscle Coordination in Below-Knee Amputees** (#450)
Nicholas Fey, Anne Silverman, Albert Portillo, Gail Walden, Gordon Bosker & Richard Neptune
The University of Texas at Austin

11:45 **Decreased Stability of Multisegmental Postural Coordination in ACL-Injured Female Athletes** (#483)
Adam Kiefer, Kevin Ford, Mark Paterno, Gregory Myer, Michael Riley, Kevin Shockley & Timothy Hewett
University of Cincinnati

12:00 **A Simple, Anatomically Based Correction to the Conventional Ankle Joint Center** (#110)
Dustin Bruening, Ashlie Crewe & Frank Buczek
University of Delaware, Shriners Hospitals for Children

12:15 - 1:30 pm: Box Lunch at Vendor Exhibit (Michigan League)
ASB Annual Business Meeting (MLB 1400 AUD 4)
Free Matlab Tutorial (1420 MLB)

Friday, August 8, 2008

Scientific Sessions

Methods/Instrumentation II (Podium Session 16)

Friday, August 8: 10:45 am – 12:15 pm
Location: Rackham Amphitheatre
Session chairs: Stacie Ringleb, Kristin Zhao

10:45 **A Comparison of Musculoskeletal Model Predictions of Muscle Strain With Dynamic MRI Measures** (#408)
Amy Silder, Scott Reeder & Darryl Thelen
University of Wisconsin-Madison

11:00 **Rectus Femoris Moment Arms Estimated Over a Large Range of Motion From Real-Time MRI** (#441)
Niccolo Fiorentino, Jonathan Lin, Mike Guttman, Elliot McVeigh & Silvia Blemker
University of Virginia

11:15 **Automatic Extraction of Distal Femur Articular Geometric Measures From 3D Surface Data** (#248)
Kang Li, Scott Tashman, Christopher Harner & Xudong Zhang
University of Pittsburgh

11:30 **Dynamics Analysis of Ankle, Knee and Hip Joint in Sagittal Plane Using a Wearable Sensor System** (#439)
Rencheng Zheng, Tao Liu, Yoshio Inoue, Kyoko Shibata & Kun Liu
Kochi University of Technology

11:45 **A Novel Ambulatory Device for Continuous 24-H Monitoring of Physical Activity in Daily Life** (#586)
Bijan Najafi, James Wrobel & David Armstrong
Rosalind Franklin University of Medicine and Science

12:00 **Quantifying and Predicting Elevation Angle Error Using Tri-Axial Accelerometer During Dynamic Motion** (#238)
Tal Amasay & Andrew Karduna
University of Oregon

Shoulder (Podium Session 17)

Friday, August 8: 10:45 am – 12:15 pm
Location: Mendelsohn Theatre
Session chairs: Wendy Murray, Maury Nussbaum

10:45 **Unconstrained Shoulder Joint Position Sense Does not Change With Body Orientation** (#568)
Jason Chapman, David Suprak & Andrew Karduna
University of Oregon

11:00 **The Relationship Between Glenoid Inclination and In-Vivo Glenohumeral Joint Motion During Shoulder Abduction** (#14)
Jennifer Bishop, Stephanie Kline, Kristopher Aalderink & Michael Bey
Henry Ford Hospital

11:15 **A Multi-Subject Evaluation of Uncertainty in Anatomical Landmark Location on Shoulder Kinematic Description** (#185)
Joseph Langenderfer, Paul Rullkoetter & Peter Laz
Central Michigan University

11:30 **Muscle Activity in Various Overhead Work Postures** (#394)
Steven Fischer, Jaclyn Chopp & Clark Dickerson
University of Waterloo

11:45 **Muscle Contributions to Joint Stability in the Anatomical Shoulder** (#349)
David Ackland & Marcus Pandy
University of Melbourne

12:00 **3-D Strength Surfaces of Shoulder Internal and External Rotation** (#374)
Gary Pierce & Laura Frey-Law
University of Iowa

12:15 - 1:30 pm: Box Lunch at Vendor Exhibit (Michigan League)
ASB Annual Business Meeting (MLB 1400 AUD 4)
Free Matlab Tutorial (1420 MLB)

Friday, August 8, 2008

Scientific Sessions

Rehabilitation (Podium Session 20)

Friday, August 8: 1:30 - 3:00 pm
Location: MLB 1200 AUD 3
Session chairs: Sylvie Nadeau, Dany Gagnon

1:30 **Virtual Reality in Stroke Rehabilitation** (#235)
Martha Walker, Stacie Ringleb, George Maihafer, Jessica Crouch, Nigel Tierney, Bonnie Van Lunen, Gianluca De Leo, Jean Shelton, Robert Walker & Hector Garcia
Old Dominion University

1:45 **Limited Assistance Practice Increases Active Dorsiflexion Range of Motion in the Impaired Ankle of Stroke Subjects** (#577)
Kari Danek, Brent Gillespie, Daniel Ferris, Jessy Grizzle & James Patton
University of Michigan

2:00 **Effects of Ankle Stretching on Passive and Active Muscle-Tendon Properties of Plantar Flexors in Stroke** (#493)
Fan Gao & Li-Qun Zhang
Northwestern University

2:15 **Bilateral Lower Limb Force Production in Individuals With Post-Stroke Hemiparesis** (#81)
Ann Simon, Brian Kelly & Daniel Ferris
University of Michigan

2:30 **Improved Locomotion in Human SCI Through Motor Adaptation** (#346)
Ming Wu, T. George Hornby, W. Zev Rymer & Brian Schmit
Rehabilitation Institute of Chicago, Northwestern University

2:45 **Influence of Wheelchair Suspension on Seat Forces and Head Accelerations During Curb Descent Landings** (#344)
Philip Requejo, Jill McNitt-Gray & Henryk Flashner
Rancho Los Amigos National Rehabilitation Center

Computational Modeling II (Podium Session 19)

Friday, August 8: 1:30 - 3:00 pm
Location: MLB 1400 AUD 4
Session chairs: Darryl Thelen, Jeff Reinbolt

1:30 **A Practical Model of the Muscle/Tendon Moment Arms in a Thumb** (#76)
John Wu, Kai-Nan An & Robert Cutlip
National Institute for Occupational Safety and Health (NIOSH)

1:45 **Creation of the Geometry for a Finite Element Model of the Wrist Under Loaded and Unloaded Conditions** (#449)
Charlotte Curtis, Robert Dony, Michele Oliver, Anne Agur, David Salonen & Vincent Lo
University of Guelph

2:00 **Refinements of Moment-Based Cost Functions Improve Prediction of Experimental Moment Profiles in Cycling** (#289)
Herman van Werkhoven, Joseph Sommer & Philip Martin
The Pennsylvania Sate University

2:15 **Real-Time Estimation of Muscle Forces From Inverse Dynamics** (#198)
Antonie van den Bogert, Thomas Geijtenbeek & Oshri Even-Zohar
Cleveland Clinic Foundation

2:30 ***An EMG-Driven Forward Simulation of Single Support Phase During Gait** (#400)
Qi Shao & Thomas Buchanan
University of Delaware

*Delsys Award Winner

2:45 **Toward a Minimal Input Model for Joint Moment Estimation During Gait** (#269)
Michael Hahn
Montana State University

3:00 - 3:30 pm: Coffee at Vendor Exhibits (Michigan League)

Friday, August 8, 2008

Scientific Sessions

Cartilage (Podium Session 18)

Friday, August 8: 1:30 - 3:00 pm
Location: Rackham Amphitheatre
Session chairs: John Elias, Li-Qun Zhang

1:30 **Frictional Properties of Intact Mutant PRG4 Mouse Knee Articular Cartilage** (#518)
Elizabeth Drewniak, Michael Rainbow, Gregory Jay, Braden Fleming & Joseph Crisco
Brown University

1:45 **Quantifying Meniscal Volume and Articular Cartilage Thickness in Patients Treated With Partial Meniscectomy** (#55)
Megan Bowers, Glenn Tung, Heidi Oksendahl, Michael Hulstyn, Paul Fadale & Braden Fleming
Brown University

2:00 **Cartilage Cell Viability After Submaximal and Maximal Muscle Loading With and Without Impact Loading** (#375)
Douglas Bourne, John Matyas, Ken Muldrew & Walter Herzog
University of Calgary

2:15 **Elucidating the Relationship Between Residual Incongruities, Elevated Contact Stresses, and Cartilage Degeneration in Fractures of the Tibial Plafond** (#134)
Thaddeus Thomas, Chris Van Hofwegen, Donald Anderson, J.L. Marsh & Thomas Brown
University of Iowa

2:30 **Correlation Between Focal Cartilage Thickness and Femur Cartilage Contact Regions During Running** (#489)
William Anderst, Eric Thorhauer & Scott Tashman
University of Pittsburgh

2:45 **The Adduction Moment During Walking is Correlated With Cartilage Thickness Ratio in Younger Male Subjects** (#588)
Chris Dyrby, Jessica Asay, Seungbum Koo & Thomas Andriacchi
Stanford University

Gait II (Podium Session 21)

Friday, August 8: 1:30 - 3:00 pm
Location: Mendelsohn Theatre
Session chairs: Clare Milner, Brandi Row

1:30 **Strategies for Walking on a Laterally Oscillating Treadmill** (#265)
Brian Peters, Rachel Brady & Jacob Bloomberg
Wyle Laboratories

1:45 **Dynamic Stability of Walking During Anterior-Posterior and Medio-Lateral Support Surface and Visual Field Translations** (#430)
Patricia McAndrew, Jonathan Dingwell & Jason Wilken
University of Texas

2:00 **Direction-Dependent Weighting of Vision for Balance During Walking** (#557)
Shawn O'Connor & Arthur Kuo
University of Michigan

2:15 **Effects of Long-Duration Space Flight on Toe Clearance During Treadmill Walking** (#295)
Chris Miller, Brian Peters, Rachel Brady, Ajitkumar Mulavara, Jason Richards, Matthew Hayat & Jacob Bloomberg
Wyle Laboratories

2:30 **Locomotion Stability in Simulated Martian Gravity: Insights on the Influence of Load Location** (#354)
Melissa Scott-Pandorf, Dan O'Connor, Charles Layne, Kresimir Josic & Max Kurz
University of Houston

2:45 **Predictive Simulation of Gait at Low Gravity Using Direct Collocation** (#78)
Marko Ackermann & Antonie van den Bogert
Cleveland Clinic Foundation

3:00 - 3:30 pm: Coffee at Vendor Exhibits (Michigan League)

Friday, August 8, 2008

Scientific Sessions

Ergonomics II (Podium Session 23)

Friday, August 8: 3:30 - 5:00 pm
Location: MLB 1200 AUD 3
Session chairs: Clark Dickerson, Joan Stevenson

3:30 **Biomechanical Analysis of Opening Glass Jars: Using Kinematics to Inform Design** (#225)
Joseph Fair, Tamara Reid Bush & Laura Bix
Michigan State University

3:45 **Overhead Grasp Capability for Typical Ladder Handholds** (#294)
Justin Young, Michael Sackllah, Chuck Woolley, Tom Armstrong & James Ashton-Miller
University of Michigan

4:00 **Learning Effects of Simultaneous Grip and Shoulder Exertion on Muscle Activity** (#298)
Joanne Hodder & Peter Keir
McMaster University

4:15 **Constrained Handgripping Reduces Maximal Arm Strength and Muscle Activation of the Upper Extremities** (#230)
Martin Smets, Potvin Jim & Peter Keir
McMaster University

4:30 **The Effect of the Object Distance on Hand Movement During Reach-to-Grasp Tasks** (#507)
Sungchan Bae & Thomas Armstrong
University of Michigan

4:45 **Vibration Transmissibility of Multi-Body Segments in Reach Movements Under Whole-Body Vibration Exposure** (#103)
Heon-Jeong Kim & Bernard Martin
University of Michigan

Aging II (Podium Session 22)

Friday, August 8: 3:30 - 5:00 pm
Location: MLB 1400 AUD 4
Session chairs: Sibylle Thies, Alaa Ahmed

3:30 **Postural Control During a Standing Turning Task in Young and Older Adults** (#524)
Jennifer Baird & Richard Van Emmerik
University of Massachusetts-Amherst

3:45 **Change of Postural Feedback Gain Scaling by Aging** (#151)
Seyoung Kim, Fay Horak & Sukyung Park
KAIST

4:00 **Stability of Superior Segments During Gait in Older Adults** (#279)
Hyun Gu Kang & Jonathan Dingwell
Hebrew SeniorLife, Harvard Medical School

4:15 **Can Thinking be Hazardous to Your Balance? The Effects of Cognition on Postural Stability in Older Adults** (#389)
Jeffrey Haddad, Winona Snapp-Childs, Richard Van Emmerik & Matthew Davidson
Purdue University

4:30 **Age-Related Changes in the Neuromuscular Coordination of Human Walking** (#116)
Anne Schmitz, Amy Silder, Bryan Heiderscheit, Jane Mahoney & Darryl Thelen
University of Wisconsin- Madison

4:45 **Walking Speed, Leg Strength, Range of Motion, and Dynamic Stability in the Gait of Healthy Older Adults** (#281)
Hyun Gu Kang & Jonathan Dingwell
Hebrew SeniorLife, Harvard Medical School

5:00 - 7:00 pm: Poster Session II (Michigan League)
6:30 - 8:00 pm: Student Mentoring Session (Rackham Assembly Hall, 4th Floor)
7:00 - later: Night on the Town (Buses Circulate Between Campus Downtown and Hotels)

Friday, August 8, 2008

Scientific Sessions

Tendon & Ligament (Podium Session 24)

Friday, August 8: 3:30 - 5:00 pm
Location: Rackham Amphitheatre
Session chairs: John Wu, Zong-Ming Li

3:30 **Native Ulnar Collateral Ligament Strain Under a Rehabilitation Protocol** (#124)
Ramon Ruberte Thiele, Geoffrey Bernas, Karen Kinnaman, Bruce Miller & James Carpenter
University of Michigan

3:45 **Achilles Tendon Moment Arms via a Hybrid Method Using Motion Analysis and Ultrasound: In Vivo Estimations in Male Subjects** (#210)
Justin Cowder, Thomas Buchanan & Kurt Manal
University of Delaware

4:00 **Use of Ultrasound to Dynamically Evaluate Achilles Tendon Mechanical Properties in Stroke** (#454)
Heng Zhao & Li-Qun Zhang
Northwestern University, Rehabilitation Institute of Chicago

4:15 **In Vivo Evaluation of The Stiffness of the Healing Human Patellar Tendon** (#49)
Hsin-Yi Liu, R. Alex Creighton, Troy Blackburn, Darin Padua & Paul Weinhold
University of North Carolina at Chapel Hill

4:30 **Forces in Anterior Cruciate Ligament During Simulated Weight-Bearing Flexion With Anterior and Internal Rotational Tibial Load** (#170)
Jia-Hsuan Lo, Otto Muller, Markus Wunschel, Steffen Bauer & Nikolaus Wulker
University of Tuebingen

4:45 **Effects of Cyclic Stretch on Behavior of Tenocytes Seeded in Acellular Tendon Scaffolds** (#312)
Ting-Wu Qin, Cheng-Jun Liu, Zhi-Ming Yang, Chun-Feng Zhao, Yu-Long Sun & Kai-Nan An
West China Hospital, Sichuan University, University, Mayo Clinic

Lower Extremity (Podium Session 25)

Friday, August 8: 3:30 - 5:00 pm
Location: Mendelsohn Theatre
Session chairs: Graham Caldwell, Brian Umberger

3:30 **Differences in Hamstring Mechanics Between Shortening and Lengthening Contractions Revealed by Dynamic MRI** (#407)
Amy Silder, Christopher Westphal, Scott Reeder & Darryl Thelen
University of Wisconsin-Madison

3:45 **The Influence of Muscle Activation-Deactivation Dynamics on the Chainring Shape That Maximizes Average Crank Power** (#334)
Jeffery Rankin & Richard Neptune
The University of Texas at Austin

4:00 **Validation of Agonist and Antagonist Muscle Force Estimation During Jumping at Three Different Effort Levels** (#157)
Kevin Ford, Antonie van den Bogert, Gregory Myer, Robert Shapiro & Timothy Hewett
Cincinnati Children's Hospital, University of Kentuky

4:15 **The Effects of Mid-Air Adjustments on Knee Joint Loading When Landing From a Jump** (#409)
Guan Tan & Timothy Derrick
Iowa State University

4:30 **Gender Comparisons Between Unilateral and Bilateral Landings** (#390)
Joshua Weinhandl, Mukta Joshi & Kristian O'Connor
University of Wisconsin-Milwaukee

4:45 **Internal Femoral Forces and Moments During Running: Implications for Stress Fracture Development** (#17)
W. Brent Edwards, Jason Gillette, Joshua Thomas & Timothy Derrick
Iowa State University

5:00 - 7:00 pm: Poster Session II (Michigan League)
6:30 - 8:00 pm: Student Mentoring Session (Rackham Assembly Hall, 4th Floor)
7:00 - later: Night on the Town (Buses Circulate Between Campus Downtown and Hotels)

Friday, August 8, 2008

Poster Session II

Location: Michigan League
Time: 5:00 - 7:00 pm

2nd Floor

Room: Michigan Ballroom (Posters 167-240: Gait, Posture & Balance, Methods/Instrumentation, Lower Extremity)

167) **Differences in Lower Extremity Coordination in High- Compared to Low-Arched Female Athletes During Running** (#510)
Douglas Powell, Songning Zhang, Clare Milner, Benjamin Long & Matt Bice
University of Texas of the Permian Basin

168) **Effect of Neutral Trial on Dynamic Foot Kinematics** (#462)
Rebecca Shultz & Thomas Jenkyn
The University of Western Ontario

169) **Foot Kinematics During Barefoot Running and Cutting** (#466)
Rebecca Shultz & Thomas Jenkyn
The University of Western Ontario

170) **Does Restraining Arm Motion Alter Ground Reaction Forces During Running?** (#256)
Ross Miller, Graham Caldwell, Richard Van Emmerik, Joseph Hamill & Brian Umberger
University of Massachusetts-Amherst

171) **Relationship Between Static Arch Stiffness and Medial-Longitudinal Arch Behavior During Walking** (#494)
Pedro Rodrigues, Trampas TenBroek, Alan Tomasko & Joseph Hamill
University of Massachusetts-Amherst

172) **Trunk Bend and Twist Coordination in Runners With Low Back Pain** (#274)
Joseph Seay, Richard van Emmerik & Joseph Hamill
University of Massachusetts-Amherst

173) **Invariant Ankle Moment Patterns With Plantar Flexor Assistance From a Powered Ankle Orthosis** (#560)
Cara Lewis, Pei-Chun Kao & Daniel Ferris
University of Michigan

174) **Motor Response During Unexpectedly Reduced Plantar Flexor Torque Provided by a Powered Orthosis During Walking** (#571)
Pei-Chun Kao, Cara Lewis & Daniel Ferris
University of Michigan

175) **Gait Characteristics of the Centre of Pressure in Sub-Acute Stroke Patients** (#237)
Amanda Chisholm, Stephen Perry & William McIlroy
University of Toronto, Toronto Rehabilitation Institute

176) **Influence of Incremental Increases in Orthotic Height on Dynamic Stability in Functional Flatfooted Individuals** (#417)
Stephen Perry & Kelly Goodwin
Wilfrid Laurier University

177) **Lower Extremity Kinematic Effects of Medial Arch Support Among Functionally Flatfooted Individuals** (#107)
E. Anne Cunningham & Stephen Perry
Wilfrid Laurier University

178) **Tracking Gait Asymmetries During Rehabilitation Using Regions of Deviation Measures: A Case Study** (#443)
K. Alex Shorter, John Polk, Karl Rosengren & Elizabeth Hsiao-Wecksler
University of Illinois at Urbana-Champaign

179) **Changes in Kinetic and Kinematic Gait Parameters due to Firefighting Air Bottle Configuration** (#579)
Kiwon Park, Pilwon Hur, Karl Rosengren, Gavin Horn & Elizabeth Hsiao-Wecksler
University of Illinois at Urbana-Champaign

180) **Comparison of Variability Between Overground and Treadmill Running** (#122)
Rebecca Fellin & Irene Davis
University of Delaware

181) **A 3-D Kinematic Comparison Between Single-Belt and Split-Belt Treadmill Walking** (#386)
Allison Altman, Michael Pohl, Joaquin Barrios & Irene Davis
University of Delaware

182) **Calculation of Vertical Load Rates in the Absence of Vertical Impact Peaks** (#434)
Richard Willy, Michael Pohl & Irene Davis
University of Delaware

183) **High Energetic Cost of Sudden Center-of-pressure Advancement During Human Walking** (#567)
Peter Gabriel Adamczyk & Arthur Kuo
University of Michigan

184) **Gravitational Effects Upon Locomotion Posture** (#472)
John DeWitt, Jason Bentley, W. Brent Edwards, Gail Perusek & Sergey Samorezov
Wyle's Life Sciences Group

185) **Walking Stability Analysis of Brace and FES-Based Interventions for Multiple Sclerosis** (#478)
Vanessa Everding, Anirban Dutta & Elizabeth Hardin
Case Western Reserve University; Cleveland FES Center, Cleveland VAMC

186) **Determination of Pronation Parameters by Midsole Deformation is Independent of Running Velocity** (#22)
Torsten Brauner, Thomas Milani, Thorsten Sterzing & Doris Oriwol
Chemnitz University of Technology

187) **Matching Performance of a Hybrid Gait Recognition Solution** (#475)
Adam Fullenkamp & James Richards
University of Delaware

188) **Crossover and Free Moment During Running** (#538)
Stacey Meardon & Timothy Derrick
Iowa State University

189) **Effect of Speed on Emotion-Related Kinematics During Walking** (#547)
Rebecca Edgeworth, Brendan Keen, Elizabeth Crane & Melissa Gross
University of Michigan

190) **Changes in Wheeling Kinematics After 8 Weeks of Pushrim-Activated Power-Assisted Wheelchair Use** (#423)
Mark Tillman, John Chow, Kim Fournier, Srikant Vallabhajosula, Peter Giacobbi Jr., Frederick Dietrich, Sandra Hubbard & Charles Levy
University of Florida

191) **A Neuro-Muscoloskeletal Model for Testing Bipedal Locomotor Control Hypotheses** (#378)
Jeremy Noble & Stephen Prentice
University of Waterloo

192) **Fluctuation of EMG Patterns at Multiple Walking Speeds** (#275)
Hyun Gu Kang & Jonathan Dingwell
Hebrew SeniorLife, Harvard Medical School

193) **Conflict Resolution Task Effects on Gait Balance After a Concussion** (#258)
Robert Catena, Paul van Donkelaar & Li-Shan Chou
University of Oregon

194) **Lower Extremity Mechanical Work Explains Interindividual Variability of Running Economy** (#249)
Gary Heise, Jeremy Smith & Philip Martin
University of Northern Colorado

195) **Des Moines University Foot Model: Reliability and Case Report** (#209)
Vassilios Vardaxis, Greg Iwaasa, Phillip Hasler & James Mahoney
Des Moines University

196) **Effects of Optic Flow When Spontaneously Accelerating Towards the Walk-to-Run Transition** (#158)
Kristof De Smet, Philippe Malcolm, Veerle Segers, Matthieu Lenoir & Dirk De Clercq
Ghent University

197) **Three-Dimensional Analysis of the Trajectory of the Ankle While Running** (#148)
Thomas Cunningham, Tim Uhl, Robert Shapiro & Carl Mattacola
University of Kentucky

198) **Stability Margin During Gait: Identifying Balance Impairment in the Elderly** (#121)
Vipul Lugade, Sue Ewers, Chu Jui Chen, Sujitra Boonyong, Patima Silsupadol & Li-Shan Chou
University of Oregon

199) **Trunk Lean as a Mechanism to Reduce the Knee Joint Loading in Patients With Knee Osteoarthritis** (#576)
Heather Linley, Elizabeth Sled, Elsie Culham & Kevin Deluzio
Queen's University

200) **Measurement of Dynamic Muscle Function via Electrical Stimulation Synchronized to the Gait Cycle** (#290)
Antonio Hernandez & Darryl Thelen
University of Wisconsin-Madison

201) **Determinants for Direction of Obstacle Avoidance During Goal-Directed Locomotion** (#554)
Michael Cinelli & William Warren
Brown University

202) **Changes of Arm Movements in Dual Task Condition on Different Walking Environment in Healthy Young Adults** (#41)
Yao-Cheng Hsieh & Chiung-Yu Cho
National Cheng Kung University

203) **Multivariate Conservative Gait Pattern in Diabetes** (#21)
James Wrobel, Ryan Crews & John Connolly
Rosalind Franklin University of Medicine and Science

204) **Constraints to Overground Walking Velocity Elicited Decreased Within Subjects Gait Variability** (#473)
Adam Fullenkamp & James Richards
University of Delaware

205) **Initial Electromechanical Reaction to Rearward Perturbation** (#487)
Nitin Moholkar, Venkata Gade, Jerome Allen & W. Thomas Edwards
Koessler Medical Rehabilitation Research & Education Center

206) **Effects of Obesity on Single Step Balance Recovery From a Forward Fall** (#219)
Michael Whitley, Michael Madigan & Kevin Davy
Virginia Polytechnic and State University

207) **Pre and Post Assessment of Normal Pressure Hydrocephalus Patients Using a Head Mounted Accelerometer** (#328)
Brandy Wozniak, Stephen Dombrowski, Brian Davis & Mark Luciano
Cleveland Clinic

208) **Postural Balance During One Leg Standing in Patients With Total Hip Arthroplasty and Surface Replacement Arthroplasty** (#351)
Marc Therrien, Julie Nantel, Martin Lavigne, Pascal-Andre Vendittoli, & Francois Prince
Marie Enfant Rehabilitation Center

209) **Physical Assistance Can be Detrimental to Learning Walking Balance** (#559)
Antoinette Domingo & Daniel Ferris
University of Michigan

210) **Determining Biomechanical Properties of Falls Using an Adult Anthropometric Dummy** (#320)
Daniel Steed, Jennica Roche & Mark Redfern
University of Pittsburgh

211) **Sensory Integration for Visually Induced Roll Tilt Perception** (#356)
Heewon Park & Sukyung Park
KAIST

212) **Step to Step Variation in Step Width Suggests a Link to Variations in Trunk Kinematics** (#259)
Christopher Hurt, Karrie Hamstra-Wright, Noah Rosenblatt, Karen Troy & Mark Grabiner
University of Illinois at Chicago

213) **Perception of Weight-Bearing Distribution During Sit-to-Stand Tasks in Hemiparetic and Healthy Individuals** (#126)
Anabele Briere, Selena Lauziere, Denis Gravel & Sylvie Nadeau
Universite de Montreal

214) **Effect of the Boston Brace on Standing Balance in Adolescent Idiopathic Scoliosis** (#150)
Heydar Sadeghi & Paul Allard
Tarbiat Moallem University

215) **Poor Glucose Control is Related to Reduced Balance Control in Adults With Type II Diabetes** (#505)
Brandi Row, Kathleen Knutzen, Lorrie Brilla, Jeanne Freeman, Ying Li & Billie Lindsey
Western Washington University

216) **Gender Differences in Postural Control Strategies During Prolonged Standing** (#318)
Erika Nelson-Wong, Diane Gregory, David Winter & Jack Callaghan
University of Waterloo

217) **Estimating the Moment of Inertia of the Human Body as a Single Link Inverted Pendulum Model** (#575)
Pilwon Hur & Elizabeth Hsiao-Wecksler
University of Illinois at Urbana-Champaign

218) **Using Vicon to Determine the Area and Volume of Body Segments** (#427)
Idafe Perez Jimenez
Loughborough University

219) **Manual Segmentation of DXA Scan Images Results in Reliable Upper and Lower Extremity Tissue Mass Estimates** (#304)
Timothy Burkhart, Katherine Arthurs & David Andrews
University of Windsor

220) **Measuring In-Vivo Humeral Head Translation Using Fluoroscopy: A Comparison of Static and Dynamic Positioning** (#268)
Jun San Juan & Andrew Karduna
University or Oregon

221) **Radiostereometric Analysis (RSA) Calibration Accuracy is Unaffected by Non-Orthogonal Images** (#196)
Angela Kedgley & Thomas Jenkyn
The University of Western Ontario

222) **Development of a Laser Reflectance System to Measure the Cross-Sectional Area of Soft Tissue** (#339)
Gabriel Pokhai, Karen Gordon & Michele Oliver
University of Guelph

223) **Calculation Method Affects Tibial Acceleration Slope Values** (#5)
Adriana Holmes, Nikki Nolte & David Andrews
University of Waterloo

224) **A Unifying Approach to Determine the Number of Padding Points When Digitally Filtering Kinematic Data** (#31)
Samuel Howarth & Jack Callaghan
University of Waterloo

225) **Longitudinal Strain Estimation in Muscles, Tendons, and other Incompressible Generalized Cylinders** (#479)
Qi Wei & Dinesh Pai
University of British Columbia, Rutgers University

226) **Analysis of the Internal Stresses in USS I Pedicle Screws Using the Photoelasticity** (#64)
Sarah Fakhouri, Ariane Zamarioli, Antonio Carlos Shimano, Cleudmar Amaral Araujo, Helton Defino, Patricia Silva & Otavio Terra
University of Sao Paulo

227) **The Influence of Noise and Time Series Length on Two Common Measures of Entropy** (#357)
Tobin Silver, Chris Rhea, Breanna Studenka, Joong Hyun Ryu, Charmayne Mary Lee Hughes & Jeffrey Haddad
Purdue University

228) **The Comparison of Supinated and Pronated Foot in Ground Reaction Forces Attenuation During Single Leg Drop-Landing** (#58)
Ali Abbasi, Heydar Sadeghi & Mehdi Khaleghi
Tarbiat Moallem University of Tehran

229) **Gender Differences in Peak Vertical Ground Reaction Force and Rate of Loading During Stop-Jump Task** (#57)
Ali Abbasi, Heydar Sadeghi & Mehdi Khaleghi
Tarbiat Moallem University of Tehran

230) **Dynamic Foot Mobility in High and Low Arched Individuals** (#177)
Andrew Barnes, Jonathan Wheat & Clare Milner
Sheffield Hallam University

231) **Quantification Using Fluoroscopic RSA of Syndesmotic Motion in the Intact State and Following Simulation of High Ankle Sprain** (#111)
Angela Kedgley & Thomas Jenkyn
The University of Western Ontario

232) **Bilateral Intermittent Claudication Affects Joint Powers During Gait** (#51)
Panagiotis Koutakis, Sara Myers, Jason Johanning, Iraklis Pipinos & Nick Stergiou
University of Nebraska at Omaha

233) **Biomechanical Changes During Prolonged Running** (#195)
Lisa Stirling, Vincent Von Tscharner, Seong Hoon Kim & Benno Nigg
University of Calgary

234) **Impact Attenuation Through Human Body During Heel-Toe Running With Different Cushioning Shoes** (#292)
Yongkoo Lee, Martijn Klein Horsman & Benno Nigg
University of Calgary

235) **Quadriceps EMG During Weighted Knee Extension Following Total Knee Arthroplasty** (#367)
Jeannette Byrne & Stephen Prentice
Memorial University of Newfoundland

236) **How Does Isolated Gastronemius Contracture Affect Plantar Pressure in Neurologically Healthy Subjects?** (#207)
Nicole Chimera, Michael Castro & Kurt Manal
University of Delaware

237) **Minimal Foot Clearance in Stair Descent: Application of a Simple, Robust Empirical Methodology** (#280)
Tyler Cluff & D. Gordon E. Robertson
University of Ottawa

238) **Motor Unit Discharge During Steady Isometric Contractions With the Dorsiflexor Muscles** (#293)
Mark Jesunathadas, Malgorzata Klass, Jacques Duchateau & Roger Enoka
University of Colorado

239) **An Ankle Orthosis With a Subtalar Locking System is More Effective in Restricting Passive and Active Ankle Kinematics** (#85)
Songning Zhang, Michael Wortley, Qingjian Chen, Julia Freedman & Casey Riley
The University of Tennessee

240) **Subject-Specific Changes in Knee Loading in Response to an Unstable Shoe Intervention** (#310)
Katerina Blazek, Katherine Boyer & Thomas Andriacchi
Stanford University

2nd Floor
Room: Vandenberg (Posters 241-256: Lower Extremity, Sport Science)

241) **The Relationship Between Knee Valgus When Squatting and During Vertical Jump Takeoff and Landing** (#531)
Mostafa Afifi, Kristinn Heinrichs & Richard Hinrichs
Arizona State University

242) **Association Between 30sec Maximal Tethered Swimming and Swimming Performance in Front Crawl** (#380)
Pedro Morouco, Susana Soares, Joao Paulo Vilas-Boas & Ricardo Fernandes
University of Porto, Polytechnic Institute of Leiria, Portuguese Swimming Federation

243) **Influence of Cadence, Power Output and Hypoxia on the Joint Powers and Muscle Excitation During Cycling** (#184)
David Sanderson, Guillaume Mornieux, Jordan Guenette & Bill Sheel
University of British Columbia

244) **Total Kinetic Energy Production of Body Segments is Different Between Racing and Training Pace in Elite Olympic Rowers** (#112)
Daniel Bechard, Angela Kedgley, Volker Nolte & Thomas Jenkyn
The University of Western Ontario

245) **Kinematic Analysis on Influence of an Extra Weight in Horizontal Arm Swing** (#542)
Young-Kwan Kim & Richard Hinrichs
Arizona State University

246) **Arm Swing of Volleyball Spike Jump Performance Between Advanced and Recreational Female Players** (#306)
ChengTu Hsieh & Gary Heise
University of Texas, Pan American

247) **Effects of an Unstable Shoe Construction in Low Speed Running** (#143)
Katherine Boyer, Katerina Blazek & Tom Andriacchi
Stanford University

248) **The Association of Foot Print Parameters and Running Training Level/Event Focus** (#70)
Jeanna Fascione, Ryan Crews & James Wrobel
Rosalind Franklin University of Medicine and Science

249) **The Effectiveness of an Unstable Shoe on Golf Performance and a Reduction of Low Back Pain** (#88)
Elysia Davis, Benno Nigg, David Lindsay & Carolyn Emery
University of Calgary

250) **Plantar Loading Differences Between Racing Flats and Training Shoes at a Self-Selected Running Speed** (#8)
Robin Queen, Jordan Yoder, Johannes Wiegerinck, Jennifer Boyd, Alicia Abbey & James Nunley
Duke University Medical Center

251) **Hip Kinematics During Three Soccer Kicking Tasks** (#39)
Robin Queen, Brian Charnock & William Garrett
Duke University Medical Center

252) **A Quantitative Analysis of Joint Phasing and Efficiency in the Olympic Clean** (#154)
Justin Byers, Tom Wu & Pierre Gervais
University of Alberta

253) **Two-Dimensional Sequential Analysis of the Underhand Softball Pitch** (#461)
John Garner, Wendi Weimar & Nels Madsen
University of Mississippi

254) **Head Motion During Baseball Pitching** (#46)
Dave Fortenbaugh, Glenn Fleisig, Shouchen Dun & James Andrews
American Sports Medicine Institute

255) **The Comparison of Kinetics and Kinematics Among Different Types of Resistance Training** (#141)
Hsiang-Hsin Wang, Tzyy-Yuan Shiang & Chuan-Show Chen
Taiwan Sport University

256) **Ground Reaction Forces in Skateboarding: The Ollie** (#319)
Matthew Nevitt, Jeremy Determan, Joseph Cox & Edward Frederick
Sole Technology Institute

2nd Floor

Room: Hussey (Posters 257-272: Rehabilitation, Aging)

257) **Contribution of Active Dorsiflexion to Toe Clearance in Transtibial Amputees: A Case Study** (#254)
Noah Rosenblatt, Jeremy Crenshaw, Jason Wenning & Mark Grabiner
University of Illinois

258) **Muscular Demands During Prosthetic Leg Swing Increase due to Increased Interactions Among Segments** (#220)
Jeremy Smith & Philip Martin
University of Northern Colorado

259) **Shape Memory Alloys, an Alternative Actuation Method for Orthosis Devices** (#517)
Ehsan Tarkesh Esfahani, Mohammad Elahinia, Mohamed Hefzy & Charles Armstrong
University of Toledo

260) **The Influence of Trans-Tibial Prostheses' Mechanical Properties on the Performance of the Amputee** (#360)
Matthew Major, Martin Twiste, Laurence Kenney & David Howard
University of Salford

261) **Neural Coupling Between the Upper and Lower Limbs in Individuals With Incomplete Spinal Cord Injury** (#420)
Helen Huang & Daniel Ferris
University of Michigan

262) **Temporal Changes in Motor Impairments and Gait Function Post Stroke** (#239)
Theresa Hayes Cruz & Yasin Dhaher
Northwestern University, Rehabilitation Institute of Chicago

263) **Mechanisms Underlying Increased Walking Speed After Rehabilitation in Persons With Post-Stroke Hemiparesis** (#125)
Jessica Allen, Mark Bowden, Steven Kautz & Richard Neptune
University of Texas

264) **Effects of Muscle Vibration on Control of Finger Movements Following Stroke** (#45)
Bing-Shiang Yang
National Chiao Tung University

265) **Anthropometric Parameters in the Elderly: A DXA-Based Study** (#166)
April Chambers, Jean McCrory, Alison Sukits & Rakie Cham
University of Pittsburgh

266) **Examination of Joint Work During Walking in Older Adults** (#160)
Cory Christiansen & Gary Heise
University of Colorado

267) **Effects of Aging on Gait Initiation When Combined With a Change of Direction** (#26)
Evelyn Anaka & Philippe Corbeil
Universite Laval

268) **The Effect of Dual Task And Proprioceptive Stimulation on Stepping Ability for Fallers and Nonfallers** (#59)
Chiung-Yu Cho & Li-Ping Hsiao
National Cheng Kung University

269) **Perceptuo-Sensory, Cognitive and Sensory-Motor Characteristics That Influence the Ability to Recover Balance to Avoid a Fall** (#492)
Alessandro Telonio, Helene Corriveau & Cecile Smeesters
Universite de Sherbrooke

270) **Effect of Age and Target Length on the Speed-Accuracy Trade-Off of Center of Pressure Movements Near the Anterior Margin of the Base of Support in Standing** (#580)
Manuel Hernandez, James Ashton-Miller & Neil Alexander
University of Michigan

271) **Postural Stability in Individuals With Normal and Low Bone Mineral Density** (#385)
Chip Wade, Andrea Johnson, Scott Breloff & M. Allison Ford
Auburn University

272) **Effects of A 6-Month Yoga Program on Scapular Posturing in Older Adults With Hyperkyphosis** (#28)
Man-Ying Wang, Abbie Ferris, Gail Greendale & George Salem
University of Southern California

3rd Floor

Room: Room 'D' (Posters 273-288: Orthopaedics, Upper Extremity)

273) **A Test Method for the Fatigue Testing of Tibial Intramedullary Nails Using Segment Constructs** (#176)
J. Craig Fryman, Balz Mueri, Barbara Kralovic & Roger Kenyon
Zimmer, Inc.

274) **Cadaveric Measurement of Impact Force on Total Hip Arthroplasty Surgical Instrumentation** (#173)
Cristina West & J. Craig Fryman
Zimmer, Inc.

275) **Assessment of Motion of Long-Stemmed Tibial Implant** (#369)
Jill Schmidt & Heidi-Lynn Ploeg
University of Wisconsin-Madison

276) **Subtalar Joint Kinetics During Standing and Walking** (#530)
Tara Sulewski, Tamara Cohen, Gregory Lewis & Stephen Piazza
The Pennsylvania State University

277) **Scratching Vulnerability of Conventional vs. Highly Crosslinked Polyethylene Liners With Embedded Third Body Particles** (#87)
Anneliese Heiner & Thomas Brown
University of Iowa

278) **Hand Approach Velocity and Impact Force During Manual Wheelchair Propulsion** (#534)
Shashank Raina, Jill McNitt-Gray & Philip Requejo
University Of Southern California

279) **Moment Arms of the Muscles Crossing the Anatomical Shoulder** (#348)
David Ackland & Marcus Pandy
University of Melbourne

281) **Asymmetric Tonic Neck Reflexes Induced Changes in Joint Torque Generation in the Hemiparetic Upper Extremity: Preliminary Results** (#480)
Jules Dewald, Mike Ellis & Thierry Keller
Northwestern University

282) **Separability of Individuals With Non-Specific Arm Pain From Asymptomatic Subjects Using EMG Spike Shape Analysis** (#233)
Kristina Calder, David Gabriel & Linda McLean
Queen's University

284) **Neuromuscular Activation in the Wrist During Isometric Contractions** (#215)
Sarah Eby & Michael Hahn
Montana State University

285) **Flexor Tendon and Median Nerve Excursion in Healthy and Self-Identified Symptomatic Wrists** (#272)
Melanie Lopes & Peter Keir
York University

286) **Segmentation of Computed Tomography Data and Creation of a Three-Dimensional Representation of the Wrist** (#213)
Vincent Lo, Michele Oliver, Robert Dony, Anne Agur & David Salonen
University of Guelph

287) **Upper Extremity Soft and Rigid Tissue Mass Prediction Using Segment Anthropometric Measures and DXA** (#93)
Katherine Arthurs, Timothy Burkhart & David Andrews
University of Windsor

288) **Three-Dimensional Endpoint Force Production of Muscles in the Extended Thumb: Possible Evidence for a Translational Degree of Freedom at the Base Joint That Dramatically Affects Force Production** (#528)
Joseph Towles & Vincent Hentz
Rehabilitation Institute of Chicago

3rd Floor

Room: Henderson (Posters 289-312: Computational Modeling, Clinical)

289) **Computational Modelling of Peri-Implant Bone Healing Considering Cell-Biomaterial Interactions** (#33)
Nadia Amor, Liesbet Geris, Jos Vander Sloten & Hans Vanoosterwyck
Katholieke Universiteit Leuven

290) **Numerical Modeling of Age Related Remodelling of Thoracic Aorta and Mechanical Stress Consequences** (#60)
Hanieh Niroomand oscuii, Mohammad Tafazzoli-Shadpour & Farzan Ghalichi
Sahand University of Technology

291) **Static Optimization of Muscle Forces During Drop Landings: A Comparison of Cost Functions** (#447)
W. Brent Edwards, Brett Sealine, Ross Miller, Jason Gillette & Timothy Derrick
Iowa State University

292) **Neuromuscular Biomechanics Simulation Ontology** (#163)
Anders Sandholm & Daniel Thalmann
Swiss Federal Institute of Technology

293) **A Forward Bio-Dynamic Model for a Three-Segment Open-Chain System: An Application to Multi-Fingered Hand Movement** (#241)
Kang Li & Xudong Zhang
University of Illinois, University of Pittsburgh

294) **Moment-Generating Capacity of Tendons in Finger Movements: Evaluation of the Tendon Moment Arms Obtained From the Excursion Method** (#529)
Sang Wook Lee & Derek Kamper
Rehabilitation Institute of Chicago

295) **Muscle Force Estimates for Walking Using an EMG-Driven Musculoskeletal Model of the Knee are Reliable Within and Between Days** (#453)
Kurt Manal, Lynn Snyder-Mackler, Michael Axe & Thomas Buchanan
University of Delaware

296) **A Proportional Derivative Controller for Planar Human Arm Movement Using Functional Electrical Stimulation** (#199)
Kathleen Jagodnik, Robert Kirsch & Antonie van den Bogert
Case Western Reserve University; Lerner Research Institute

297) **Image-Based Mesh Generation and its Role Within Computational Biomechanics** (#350)
Philippe Young, Terry Beresford-West & Frank Murphy
University of Exeter

298) **Biomechanical Simulation of a Greater Trochanter Fixation System** (#355)
Kajsa Duke, G.Yves Laflamme & Yvan Petit
Ecole de Technologie Superieure, Hopital du Sacre-Coeur Montreal

299) **Blood Flow and Oxygen Level Characterization of the Forearm With Changes in Normal and Shear Load** (#161)
Abinand Anbazhagan Manorama, Seungik Baek & Tamara Reid Bush
Michigan State University

300) **Is Upper Extremity Loading Symmetric During Weight-Relief Lifts Performed by Individuals With Spinal Cord Injury?** (#511)
Dany Gagnon, Sylvie Nadeau, France Piotte & Luc Noreau
Universite de Montreal

301) **The Effectiveness of Wrist Guards for Reducing Wrist and Elbow Accelerations Following Simulated Forward Falls** (#92)
Timothy Burkhart & David Andrews
University of Windsor

302) **Ground Reaction Forces Recorded Underneath Hands During Sitting Pivot Transfers in Individuals With Spinal Cord Injury** (#509)
Dany Gagnon, Sylvie Nadeau, France Piotte, Luc Noreau & Denis Gravel
Universite de Montreal

303) **Comparison of Muscle Activity During Common Lower Extremity Rehabilitation Exercises** (#569)
Sabrina Silver, Cara Lewis & Riann Palmieri-Smith
University of Michigan

304) **Electromyography Evaluation of Manual Muscle Tests** (#329)
Rebecca Brookham, Clark Dickerson & Linda McLean
University of Waterloo

305) **Efficiency of Step-to-Step Transition Work in Hemiparetic Gait** (#537)
Daniel Hewson, Arrlann Christie, Janice Eng & Max Donelan
Simon Fraser University

306) **The Relationship Between Static Arch Height and Arch Stiffness** (#179)
Andrew Barnes, Jonathan Wheat & Clare Milner
Sheffield Hallam University

307) **Does Decompressive Spinal Surgery for Older Patients With Cervical Myelopathy Improve Gait on Flat and Irregular Surfaces?** (#545)
Fatima Makhzoum, Janet Kemp, James Ashton-Miller & Frank La Marca
University of Michigan

308) **Dynamic Stability of the Parkinsonian Gait** (#404)
Christopher Arellano, Ashley Hickerson, Melissa Scott-Pandorf, Vladimir Ivkovic & Max Kurz
University of Houston

309) **Levodopa Influences the Regularity of the Ankle Joint Kinematics in Individuals With Parkinsons Disease** (#396)
Max Kurz, Ashley Hickerson, Chris Arellano, J. G. Gabriel Hou & Eugene Lai
University of Houston

310) **The Relationship Between Interjoint Coordination During Gait and Strength, Spasticity and Selective Voluntary Motor Control in Children With Spastic Diplegic Cerebral Palsy** (#243)
Evan Goldberg, Loretta Staudt, Marcia Greenberg, William Oppenheim & Eileen Fowler
University of California-Los Angeles

311) **Coordination Pattern in Children With Spastic Diplegia: Pre-Operative and 1 and 5-Years Post-Operative** (#399)
Elizabeth Russell, George Gorton, Peter Masso, Richard Van Emmerik & Joseph Hamill
University Of Massachusetst-Amherst

312) **Resistance Training Alters Joint Powers in Multiple Sclerosis Patients** (#175)
Jessie Huisinga, Mary Filipi & Nicholas Stergiou
University of Nebraska at Omaha

3rd Floor
Room: Koessler (Posters 313-331: Spine, Ergonomics)

313) **Tyramine-Based Hyaluronan Hydrogels for Nucleus Pulposus Replacement: Characterization by Magnetic Resonance Imaging** (#135)
Ediuska Laurens, Aniq Darr, William Montgomery, Lars Gilbertson, Peter Zahos, Carl Winalski, Erika Schneider, Amit Vasanji & Anthony Calabro
Cleveland Clinic Foundation, Cleveland State University

314) **Disc Height Reduction is a Better Predictor of Cervical Disc Degeneration Progression Than Reduction in the Area of Nucleus Pulposus: A Finite Element Analysis** (#532)
Mozammil Hussain & Rodger Tepe
Logan University

315) **Comparison of Anterior 3-Hole Plate and Paired/Single Anterior Cages for Anterior Lumbar Interbody Fusion** (#69)
Ethan Daley, Ramon Ruberte-Thiele, Gregory Poulter, Steven Goldstein & Gregory Graziano
University of Michigan

316) **Reproducibility of Kinematical Variables Describing Head and Neck Movement-A 3D Movement Analysis Using the Finite Helical Axis Method** (#44)
Helena Grip & Fredrik Ohberg
University Hospital of Umea

317) **Spinal Stiffness Measures do not Change With Chiropractic Manipulation Even With Clinical Improvement** (#282)
Edward Owens, David Wilder, M. Ram Gudavalli, James DeVocht & William Meeker
Palmer Center for Chiropractic Research

318) **The Effect of Gender on Abdominal Muscle Activation in Response to an Asymmetrical Leg Loading Task in Healthy Adults** (#105)
Melissa McKeon, Sarah Gordon & Cheryl Hubley-Kozey
Dalhousie University

319) **Gender Responses to Sitting in Automobile and Office Seats-Influence of Hip and Hamstring Flexibility on Seated Postures** (#30)
Tyson Beach, Katherine McDonald, Stephanie Coke & Jack Callaghan
University of Waterloo

320) **Line of Sight and Driving Posture Evaluation: What an Operator Cannot See Influences Driving Posture** (#446)
Tammy Eger, Alison Godwin, Sylvain Grenier & Jack Callaghan
Laurentian University

321) **Validation of an Instrumented Handrail Stairway System** (#459)
Matija Radovic, Nicholas Hanson, Palav Deka & Shing-yen Chen
University of Nebraska at Omaha

322) **A Biomechanical Investigation of the Forces Applied to Lift Truck Steering Wheels: Effects of Posture, Gender and Steering Forces on Cumulative Low Back Loading** (#508)
Sylvain Grenier, Aaron Kocielek & Tammy Eger
Laurentian University

323) **Modeling Muscle Fatigue for Multiple Joints** (#412)
Ting Xia & Laura Frey Law
University of Iowa

324) **Lumbar Spine Movement and Pain During Prolonged Seated Work** (#162)
Nadine Dunk & Jack Callaghan
University of Waterloo

325) **The Effect of External Loads on Whole Body Discomfort** (#77)
Seokhee Na, Min Chung, Dohyung Kee & Maury Nussbaum
Virginia Tech

326) **Changes in Thoracolumbar Kinematics and Centre of Pressures While Performing a Lifting and Lowering Task** (#465)
Carolyn Duncan, Scott MacKinnon & Wayne Albert
Memorial University of Newfoundland

327) **A Comparison of the Repeatability of Submaximal and Maximal Methods Commonly Employed for Normalization of the Erector Spinae Muscles in the Thoracic and Lumbar Region** (#381)
Jennie Jackson, Niall O'Brien, Patrick Dempsey & Jack Callaghan
University of Waterloo

328) **Effects of Load and Frequency on Muscle Activity in a Repetitive Upper Extremity Task** (#287)
Melissa Brown & Peter Keir
McMaster University

329) **Video Evaluation of Distal Upper Extremity Posture** (#300)
Aaron Kociolek & Peter Keir
McMaster University

330) **The Effects of Task Rotation on Muscle Activity and Fatigue** (#313)
Michael Holmes, Kia Sanei & Peter Keir
McMaster University

331) **A Comparison of the Kinematics of Ladder Climbing Using Rungs vs. Side Rails** (#552)
Hogene Kim, Justin Young, Chuck Woolley, Tom Armstrong & James Ashton-Miller
University of Michigan

Saturday, August 9, 2008

< 8:00 am **Coffee (Michigan League)**

8:00 **ISB Keynote Lecture**
Location: Rackham Auditorium

Low Back Injury: From Workplace to Lab and Back
Jaap van Dieën
Vrije Universiteit Amsterdam

9:00 – 9:30 am **Coffee (Michigan League)**

NOTES

NOTES

Saturday, August 9, 2008

Scientific Sessions

Injury (Podium Session 28)

Saturday, August 9: 9:30 - 11:00 am
Location: MLB 1200 AUD 3
Session chairs: David Pearsall, Scott McLean

9:30 **ACL Rupture is an In Vivo Impact Model** (#362)
Douglas Pedersen, Daniel Thedens, James Martin, Sirisha Tadimalla, Prem Ramakrishnan & Annunziato Amendola
University of Iowa

9:45 **Gender Differences During a Run to Cut Task on Surfaces With Different Friction Interactions: Implications for ACL Injury Risk** (#118)
Ariel Dowling, Stefano Corazza, Todd Alamin, Ajit Chaudhari & Thomas Andriacchi
Stanford University

10:00 **Tibiofemoral Moments of Force and Co-Stabilization: Revisiting the Non-Contact Mechanism of Anterior Cruciate Ligament Injury** (#324)
Jeffery Podraza & Scott White
University at Buffalo, Daemen College

10:15 **Shear Thickening Fluid Based Protective Foam Padding** (#563)
Sarah Trager, Norman Wagner & Buz Swanik
University of Delaware

10:30 **Modifying Landing Mat Material Properties to Reduce Injuries in Gymnastics Landings** (#9)
Chris Mills, Matthew Pain & Maurice Yeadon
University of Exeter

10:45 **A Model to Determine the Effect of Multiple Subconcussive Impacts in the Rat** (#572)
Erin Hanlon & Cynthia Bir
Wayne State University

Posture & Balance II (Podium Session 27)

Saturday, August 9: 9:30 - 11:00 am
Location: MLB 1400 AUD 4
Session chairs: Stephen Prentice, Stephen Perry

9:30 **Effects of Seated Whole-Body Vibration on Seated Postural Sway** (#181)
Gregory Slota, Kevin Granata & Michael Madigan
Virginia Polytechnic and State University

9:45 **Can Children Control Their Joint Variability in Standing While Confronting a Perturbation of Tendon Vibration?** (#255)
Jianhua (Jerry) Wu, Sandra McKay & Rosa Angulo-Barroso
Georgia State University

10:00 **Vibrotactile Tilt Feedback Reduces Mediolateral Tilt in Vestibulopathic Subjects During Locomotor Tasks** (#519)
Kathleen Sienko, Kennyn Statler, Lars Oddsson & Conrad Wall
University of Michigan

10:15 **Self-Selected Transition Between Movement Patterns on a Moving Platform** (#424)
Venkata Gade, Nitin Moholkar, Jerome Allen & W. Thomas Edwards
Koessler Medical Rehabilitation Research & Education Center

10:30 **Moving Environments and Their Effects on Thoracolumbar Kinematics and Centre of Pressure When Performing Stationary Tasks** (#470)
Carolyn Duncan, Scott MacKinnon & Wayne Albert
Memorial University of Newfoundland

10:45 **The Relationship Between Center of Pressure Displacement and Estimated Instability of Dancers and Non-Dancers While in a Moving Room** (#452)
Leigh Schanfein & Shirley Rietdyk
Purdue University

11:00 - 11:30 am: Coffee (Michigan League)

Saturday, August 9, 2008

Scientific Sessions

Muscle II (Podium Session 29)

Saturday, August 9: 9:30 - 11:00 am
Location: Rackham Amphitheatre
Session chairs: Joe Langenderfer, Sam Ward

9:30 **A Mathematical Model of Force Transmission by Desmin in Skeletal Muscle** (#314)
Gretchen Meyer, Miklos Kellermeyer, Samuel Ward & Richard Lieber
University of California-San Diego

9:45 **Development of Sarcomere Length Non-Uniformity During Lengthening Contractions of Permeabilized Single Muscle Fibers From Rat** (#471)
Appaji Panchangam, Dennis Claflin, Mark Palmer & John Faulkner
University of Michigan

10:00 **In Vivo Sarcomere Length and Fiber Tension Measurements** (#544)
Yi-Ning Wu, Yupeng Ren & Li-Qun Zhang
Rehabilitation Institute of Chicago, Northwestern University

10:15 **In Vivo Skeletal Muscle Fibre Function During Cycling** (#422)
Neal Austin, Tim Keren, Chris Wieland & Walter Herzog
University of Calgary

10:30 **Muscle Activation Timing Influences Muscle-Tendon Mechanical Performance During Cyclic Contractions** (#551)
Gregory Sawicki, Emanuel Azizi & Thomas Roberts
Brown University

10:45 **Differences in Gastrocnemius Architecture Between Sprinters and Non-Sprinters: Implications for Muscle Function** (#525)
Sabrina Lee & Stephen Piazza
The Pennsylvania State University

Pelvis (Podium Session 26)

Saturday, August 9: 9:30 - 11:00 am
Location: Mendelsohn Theatre
Session chairs: Lennox Hoyte, Daniel Simkins

9:30 **How Different Maternal Volitional Pushing Profiles Affect the Duration of the Second Stage of Labor: A 3-D Visco-Hyperelastic Finite Element Model** (#570)
Dejun Jing, James Ashton-Miller & John DeLancey
University of Michigan

9:45 ***Fundamental Biopotential Analysis for Quantification of Pudendal Nerve Injury Recovery** (#307)
Bradley Gill, Hai-Hong Jiang, Jonathan Glaab, Paul Zaszczuryski & Margot Damaser
Cleveland Clinic

*Delsys Award Finalist

10:00 **Visco-Hyperelastic Properties of the Pelvic Floor Muscles in Healthy Women** (#562)
Dejun Jing, Kuo-Cheng Lien, James Ashton-Miller & John DeLancey
University of Michigan

10:15 **Determining the Biomechanical Properties of Nulliparous and Parous Vaginal Tissue** (#457)
Andrew Feola, Keisha Jones, Pam Moalli & Steven Abramowitch
University of Pittsburgh

10:30 **Role of Pelvic Floor Muscle in Urinary Continence During a Stress to the Bladder: An Electrophysiological and Biomechanical Evaluation on Female Rats** (#146)
Hai-Hong Jiang, Levilester Salcedo, A. Marc Gustilo-Ashby , Bo Song & Margot Damaser
Cleveland Clinic

10:45 **Biomechanical Relationships Between Urodynamic Pressures During Cough and Valsalva in Normal and Stress Incontinent Women** (#53)
Thomas Spirka, Kimberly Kenton, Robert Butler, Margot Damaser & Linda Brubaker
Cleveland Clinic

11:00 - 11:30 am: Coffee (Michigan League)

Saturday, August 9, 2008

Scientific Sessions

Spine II (Podium Session 30)

Saturday, August 9: 11:30 am - 1:00 pm
Location: MLB 1200 AUD 3
Session chairs: Jacek Cholewicki, Jaap van Dieën

11:30 **Intervertebral Neural Foramina Deformation Due to Two Types of Repetitive Combined Loading** (#514)
Janessa Drake & Jack Callaghan
University of Windsor

11:45 **Continuous Motion Monitoring of the Cervical Spine** (#377)
Andrew Sterling, Daniel Cobian, Paul Anderson & Bryan Heiderscheit
University of Wisconsin-Madison

12:00 **Head and Neck Kinematics During Horizontal and Combined Horizontal/Vertical Low Velocity Whiplash-Like Perturbations** (#584)
Loriann Hynes & James Dickey
University of Guelph

12:15 **Biomechanical Properties of the Cervical Facet Joint Capsule in an In-Vivo Caprine Model** (#597)
Nadia Azar, Chaoyang Chen, Srinivasu Kallakuri & John Cavanaugh
University of Windsor

12:30 **Changes in Natural Frequency of the Trunk With Exposure to Seated Whole-Body Vibration** (#182)
Gregory Slota & Michael Madigan
Virginia Polytechnic and State University

12:45 **Ultrasound Analysis of In-Vivo Connective Tissue Deformations of the Human Abdominal Wall** (#169)
Stephen Brown & Stuart McGill
University of Waterloo

Knee II (Podium Session 32)

Saturday, August 9: 11:30 am - 1:00 pm
Location: MLB 1400 AUD 4
Session chairs: Ajit Chaudhari, Nick Stergiou

11:30 **Biomechanical Mechanisms of Knee Osteoarthritis** (#102)
Janie Astephen, Kevin Deluzio, Graham Caldwell, Michael Dunbar & Cheryl Hubley-Kozey
Dalhousie University, University of Cape Town

11:45 **Comparison of Three Dimensional Patellofemoral Joint Reaction Forces in Persons With and Without Patellofemoral Pain** (#322)
Yu-Jen Chen & Christopher Powers
University of Southern California

12:00 **Changes in Patellofemoral Contact Pressure Caused by Imbalance of the Knee Extensor Muscles** (#502)
Andrew Sawatsky, Doug Bourne, Azim Jinha & Walter Herzog
University of Calgary

12:15 **Improving VMO Function Unloads Lateral Cartilage Within the Patellofemoral Joint** (#24)
John Elias, Srianjana Kilambi, Derek Goerke & Andrew Cosgarea
Medical Education and Research Institute of Colorado

12:30 **Knee Joint Relative Motion During ACL Rupture by Internal Tibial Torsion or Tibiofemoral Compression** (#232)
Eric Meyer, Timothy Baumer & Roger Haut
Michigan State University

12:45 **Validation of the Computational Knee Joint Model Under High Compressive Loading Conditions** (#504)
Bhushan Borotikar & Antonie van den Bogert
Cleveland Clinic

1:00 - 1:30 pm: Box Lunch (Michigan League)

Saturday, August 9, 2008

Scientific Sessions

Orthopaedics II (Podium Session 33)

Saturday, August 9: 11:30 am - 1:00 pm
Location: Rackham Amphitheatre
Session chairs: Tom Brown, Richard Hughes

11:30 **Prediction of Fracture Load and Initiation Location of Acetabular Fractures by Means of Nonlinear FEM - A Feasibility Study** (#395)
Peter Vaitl, Vickie Shim, Joerg Boehme, Roland Huelse, Ian Anderson & Chistoph Josten
University of Leipzig

11:45 **Comparison of Asia-Specific Sliding Intramedullary Hip Screw, Intramedullary Fixed Angle Hip Screw, and Sliding Hip Screw Plate Using Photoelastic Analyses** (#1)
Fumihiro Yoshimine, Jacob Cartner, Steve Summy & Zane Hartsell
Tokyo Metropolitan Ohkubo Hospital

12:00 **Bone Strains Associated With Femoral Neck Fracture Following Hip Resurfacing** (#52)
Jason Long, Thomas Santner & Donald Bartel
Cornell University

12:15 **Knee Mechanics While Walking on Different Surfaces After Total Knee Replacement** (#253)
Clare Milner & Michael Smith
University of Tennessee

12:30 **Changes in In-Vivo Glenohumeral Joint Contact Patterns and Clinical Outcomes From 3 to 12 Months After Rotator Cuff Repair** (#74)
Stephanie Kline, Roger Zauel, Terrence Lock & Michael Bey
Henry Ford Hospital

12:45 **Chemical Structure Effects on Bone Response To Mechanical Load** (#13)
Peizhi Zhu, Jiadi Xu, Michael Morris, Nadder Sahar, David Kohn, Ayyalusamy Ramamoorthy & Mary Tecklenburg
University of Michigan

Gait III (Podium Session 31)

Saturday, August 9: 11:30 am - 1:00 pm
Location: Mendelsohn Theatre
Session chairs: Elizabeth Hsiao-Wecksler, Max Kurz

11:30 **Feedback Driven Locomotor Adaptation in a Human Spinal Cord Injury Population** (#316)
Keith Gordon, Ming Wu, Jennifer Kahn & Brian Schmit
Rehabilitation Institute of Chicago

9:45 **Can we Assume That the Individuals With Incomplete Spinal Cord Injury Have a Symmetrical Gait Pattern?** (#338)
Sylvie Nadeau, Hugues Barbeau, Christiane Garneau & Cyril Duclos
Universite de Montreal

10:00 **Compensatory Gait Movements Post Stroke: The Influence of Synergies** (#236)
Theresa Hayes Cruz & Yasin Dhaher
Northwestern University, Rehabilitation Institute of Chicago

10:15 **Kinematic and Kinetic Changes During Gait Before and After Botulinum Toxin A Treatment in Chronic Stroke** (#315)
Alison Novak, Stephen Bagg & Brenda Brouwer
Queen's University

10:30 **Compensatory Mechanisms in Below-Knee Amputee Gait in Response to Increasing Steady-State Walking Speeds** (#80)
Anne Silverman, Nicholas Fey, Alberto Portillo, J. Gail Walden, Gordon Bosker & Richard Neptune
The University of Texas at Austin

10:45 **Transition Work in Simulated Pathological Walking** (#541)
Caroline Soo & J. Maxwell (Max) Donelan
Simon Fraser University

1:00 - 1:30 pm: Box Lunch (Michigan League)

Saturday, August 9, 2008

1:30 – 2:30 pm

Running Energetics and Biomechanics of Oscar Pistorius: A Case Study (Symposium)

Location: Rackham Auditorium
Chair: Daniel Ferris

Background: Transtibial Amputee Running Physiology
Mary Beth Brown
Georgia Tech University

Metabolic Running Economy
Alena Grabowski
Massachusetts Institute of Technology

Physiological and Mechanical Determinants of all-out Sprint Performances
Matt Bundle
University of Wyoming

Leg Mechanical Energetics
Craig McGowan
University of Texas at Austin

Panel Discussion Including Audience Questions
Rodger Kram (*University of Colorado at Boulder*)
Hugh Herr (*Massachusetts Institute of Technology*)
Mary Beth Brown *(Georgia Tech University)*
Alena Grabowski *(Massachusetts Institute of Technology)*
Matt Bundle *(University of Wyoming)*
Craig McGowan *(University of Texas at Austin)*

2:30 – 3:00 pm

Awards and Closing Ceremonies

Location: Rackham Auditorium

3:00 - 4:45 pm: ASB Executive Board Meeting (Room 4, Michigan League)

NOTES

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(includes registrants as of 7/16/08)

2008 North American Congress on Biomechanics • University of Michigan, Ann Arbor • 'Program-At-A-Glance'

Tuesday, 8/5-2008

- Registration @ League Bldg
- Bus from League Bldg to CSE on North Campus

Tutorial	Lab
I - Kuo (CSE 1690)	
II - Delp (CSE 1670)	Tours I

- Lunch on Your Own
  Free Materialise Inc. Tutorial & Pizza
  (Kalamazoo Room, League)

Tutorials	
I - Kuo (CSE 1690)	Lab
III - An (MLB 1200 Aud 3)	
IV-Vaillancourt (Rackham Amphitheater)	Tours III

Tutorials	
I - Kuo (CSE 1690)	Lab
V - Zernicke (MLB 1200)	
VI - Redfern & Goldstein (Kraus Nat. Sci. Auditorium, Room 2140)	Tours IV

- OPENING RECEPTION & VENDOR EXHIBITS (Michigan League)

ASB	CSB
Executive Board Mtg	Executive Board Mtg
(Zanzibar Restaurant)	(Zanzibar)

Wednesday, 8/6-2008

- Coffee at Vendor Exhibits (League)
- **Keynote Lecture 1**
  John O.L. DeLancey, M.D.
  "On the Challenge of Vaginal Birth"
  (Rackham Auditorium)
- **Borelli Award (ASB)**
  "Why Bones Bend But Don't Break: ..."
  David B. Burr, Ph.D.
  (Rackham Auditorium)
- Coffee at Vendor Exhibits (League)
- **ASB Awards Session**
  Post-Doc Awardee: Sam Ward (UCSD)
  Pre-Doc Awardee: Meghan McGee (MTU)
  J Biomech Award Finalists: Luyun Chen (U-M) & Heather Hayes (GT/EU)
  Clinical Biomechanics Award Finalists: Cheryl Hubley-Kozey (Dalhousie U) & Woochol Choi (SFU)
  (Rackham Audiorium)
- Box Lunch at Vendor Exhibits (League)
- Women in Biomechanics Lunch
  (Rackham 4th Floor Assembly Hall)

Auto Safety Symposium (ASB/CSB)	Motor Control 1	Methods & Instrumen-tation I	Knee I
	Podium 1	Podium 2	Podium 3
MLB 3	MLB 4	Rackham Amph	Mendelsohn

- Coffee at Vendor Exhibits (League)

Spine I	Aging 1	Bone	Sport I
Podium 4	*Podium 6*	*Podium 7*	*Podium 5*
MLB 3	MLB 4	Rackham Amph	Mendelsohn

- **POSTER SESSION I** and **VENDOR EXHIBITS** (Michigan League)
- ISB Student Travel Grants (Rackham Assembly Hall, 4th Floor)
- **Night on the Town**
- (Buses circulate between campus downtown, and hotels)

Thursday, 8/7- 2008

- Coffee at Vendor Exhibits (League)
- **Keynote Lecture II**
  Mimi A.R. Koehl, Ph.D.
  "Locomoting in a Turbulent World"
  (Rackham Auditorium)
- **CSB Career Award**
  "Biomechanicz in Three Acts"
  Ronald F. Zernicke, Ph.D.
  (Rackham Auditorium)
- **NDI New Investigator Awards (CSB)**
  (MS. Pre and Post-doc)
  (Rackham Audiorium)
- Box Lunch at Vendor Exhibits (League)
- CSB Annual General Meeting (Room: MLB 4)
  Free Matlab Tutorial (Room: 1420 MLB)

Occupational Biomechanics Symposium (CSB)	Computational Modeling I	Orthopaedics I	Gait I
MLB 3	*Podium 8* MLB 4	*Podium 9* Rackham Amph	*Podium 10* Mendelsohn

- Coffee at Vendor Exhibits (League)
- Buses to The Henry Ford Museum
- (Pick-up from Michigan League's South Entrance Doo
- (en route)
- (en route)
- **STROLLING BANQUET**
  at
  The Henry Ford Museum
  (Dearborn)
- Buses from The Henry Ford Museum
- (Drop off at hotels, downtown & central campus)

Ergonomics I	Posture & Balance I	Muscle I	Sport II
Podium 14 MLB 3	*Podium 12* MLB 4	*Podium 13* Rackham Amph	*Podium 11* Mendelsohn

Friday, 8/8-2008

- Coffee at Vendor Exhibits (League)
- **Keynote Lecture III**
  Steve Scott, Ph.D.
  "The 3 B's of Motor Control: Behavior, Brains and Biomechanics"
  (Rackham Auditorium)
- **Hay Award (ASB)**
  "From Biomechanics to Motor Control - From 1973 To 2008.
  "From Biomechanics to Motor Control - From 1973 to 2008"
  Vladimir M. Zatsiorsky, Ph.D.
  (Rackham Auditorium)
- Coffee at Vendor Exhibits (League)

Aftab Patla Symposium (CSB)	Motor Control II	Methods & Instrumen-tation II	Shoulder
MLB 3	*Podium 15* MLB 4	*Podium 16* Rackham Amph	*Podium 17* Mendelsohn

- Box Lunch at Vendor Exhibits (League)
- ASB Annual Business Meeting (Room: MLB 4)
  Free Matlab Tutorial (Room: 1420 MLB)

Rehabilitation	Computational Modeling II	Cartilage	Gait II
Podium 20 MLB 3	*Podium 19* MLB 4	*Podium 18* Rackham Amph	*Podium 21* Mendelsohn

- Coffee at Vendor Exhibits League
- **POSTER SESSION II** (Michigan League)
- Student Mentoring Session (Rackham Assembly Hall, 4th Floor)
- **Night on the Town**
- (Buses circulate between campus downtown, and hotels)

Ergonomics II	Aging II	Tendon & Ligament	Lower Extremity
Podium 23 MLB 3	*Podium 22* MLB 4	*Podium 24* Rackham Amph	*Podium 25* Mendelsohn

Saturday, 8/9-2008

- Coffee (League)
- **ISB Keynote Lecture**
  Jaap van Dieën, Ph.D.
  "Low Back Injury: From Workplace to Lab and Back"
  (Rackham Auditorium)
- Coffee (League)

Injury	Posture & Balance II	Muscle II	Pelvis
Podium 28 MLB 3	*Podium 27* MLB 4	*Podium 29* Rackham Amph	*Podium 26* Mendelsohn

- Coffee (League)

Spine II	Knee II	Orthopedics II	Gait III
Podium 30 MLB 3	*Podium 32* MLB 4	*Podium 33* Rackham Amph	*Podium 31* Mendelsohn

- Box Lunch (League)
- **Running Energetics and Biomechanics of Oscar Pistorius:**
  A Case Study (Symposium)
  Rackham Auditorium
- Awards & Closing Ceremony (Rackham Auditorium)

ASB Executive Board Mtg	
Room 4 (League)	