Detailed Program for Podium and Poster Presentations

(Notes: Author lists are in alphabetical order. Podium session chairs are TBA)

<table>
<thead>
<tr>
<th>Thursday, August 23, 2007</th>
<th>9:45 - 11:00 AM</th>
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<tbody>
<tr>
<td><strong>Podium 1: Motor Control I</strong></td>
<td>Memorial Auditorium</td>
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<td>Chair: chair</td>
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<tr>
<td>9:45 <strong>Goal equivalent control of variability in human walking</strong></td>
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<tr>
<td>Joseph Cusumano, Jonathan Dingwell, Michelle Garel</td>
<td>Corresponding Author: Jonathan Dingwell</td>
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<tr>
<td><em>University of Texas</em></td>
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<tr>
<td>10:00 <strong>Low Dimensional Motor Control and Muscle Synergies</strong></td>
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<tr>
<td>Max Berniker, Emilio Bizzi, Matthew Tresch</td>
<td>Corresponding Author: Max Berniker</td>
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<tr>
<td><em>Northwestern University</em></td>
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<tr>
<td>10:15 <strong>The transition between muscle coordination patterns is context dependent</strong></td>
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<tr>
<td>Kevin Keenan, Robert V. McNamara III, Flor Medina, Francisco Valero-Cuevas, Madhusudhan Venkadesan</td>
<td>Corresponding Author: Flor Medina</td>
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<td><em>Cornell University &amp; The University of Southern California</em></td>
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<tr>
<td>10:30 <strong>Can electromyography asymmetries during gait be explained by limb dominance?</strong></td>
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<tr>
<td>Matthew Seeley, Robert Shapiro, Brian Umberger</td>
<td>Corresponding Author: Matthew Seeley</td>
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<td><em>Brigham Young University</em></td>
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<tr>
<td>10:45 <strong>Swing phase interruption in a slip: active or passive response?</strong></td>
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<tr>
<td>Rakie Cham</td>
<td>Corresponding Author: Rakie Cham</td>
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<td><em>University of Pittsburgh</em></td>
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<tr>
<th>Thursday, August 23, 2007</th>
<th>9:45 - 11:00 AM</th>
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<tbody>
<tr>
<td><strong>Podium 2: Methods I</strong></td>
<td>Annenberg Auditorium</td>
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<tr>
<td>Chair: chair</td>
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<tr>
<td>9:45 <strong>Posturographic analysis is possible without ground reaction forces measurement through markerless motion capture</strong></td>
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</tbody>
</table>
Thomas Andriacchi, Stefano Corazza
Corresponding Author: Stefano Corazza
Stanford University

10:00 **Procrustes analysis applied to relative motion plots of locomotor patterns in sprint**
Leslie Decker, Françoise Natta, Sabine Renous
Corresponding Author: Leslie Decker
University of Nebraska-Omaha

10:15 **Estimation of hip-muscle geometry using automated, non-rigid atlas-based registration of MR images**
Ilse Jonkers, Dirk Loeckx, Lennart Scheys, Arthur Spaepen, Anja Van Campenhout
Corresponding Author: Lennart Scheys
K.U. Leuven

10:30 **Characterizing hamstrings muscle dynamics during knee flexion-extension using real-time MRI**
Silvia Blemker, Niccolo Fiorentino, Michael Guttman, Jonathan Lin, Elliot McVeigh
Corresponding Author: Niccolo Fiorentino
University of Virginia

10:45 A new method for quantifying foot bone-to-bone positions
Michael Fassbind, David Haynor, Yangqiu Hu, William Ledoux, Eric Rohr
Corresponding Author: William Ledoux
VA Puget Sound

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**Podium 3: Bone I**
Cubberly Auditorium

Chair: chair

9:45 **The enhanced daily load stimulus (EDLS): Accounting for saturation, recovery and standing**
Peter Cavanagh, Kerim Genc, Brad Humphreys, Gail Perusek
Corresponding Author: Kerim Genc
Case Western Reserve University

10:00 **A computational approach to bone remodeling postoperative to facet fusion**
Dennis Abernathie, Ferris Pfeiffer, Douglas Smith
Corresponding Author: Ferris Pfeiffer
University of Missouri

10:15 **Episodic subluxation increases third body ingress and embedment in the THA bearing surface**
Thomas Baer, John Callaghan, Anneliese Heiner, Hannah Lundberg, Douglas Pedersen
Corresponding Author: Anneliese Heiner
University of Iowa

10:30 **A new method for studying the anabolic effects of vibrational loading of bone: constrained tibial vibration in mice**
Philip Bayly, Blaine Christiansen, Matthew Silva
Corresponding Author: Blaine Christiansen
Washington University in St. Louis

10:45 **Measurements of in vivo patellofemoral joint kinematics with real-time MRI**
Gary Beaupre, Thor Besier, Christine Draper, Garry Gold, Juan Santos
Corresponding Author: Christine Draper
Stanford University
Podium 4: Aging I
Memorial Auditorium
Chair: chair

11:15 Effects of lateral stabilization and arm swing on metabolic cost of walking in young and elderly adults
Claire Farley, Leslie Fehlman, Justus Ortega
Corresponding Author: Justus Ortega
University of Colorado

11:30 Human Cervical Spine Mechanics Across the Maturation Spectrum
Randal Ching, David Linders, David Nuckley
Corresponding Author: David Nuckley
University of Washington

11:45 Load-modifying footwear intervention lowers knee adduction moment, reduces pain, and improves function in subjects with medial compartment knee osteoarthritis
Thomas Andriacchi, Jennifer Erhart, Nicholas Giori
Corresponding Author: Jennifer Erhart
Stanford University

12 noon Eccentric but not concentric muscle work is retained with age in level walking
Paul DeVita, Mandana Fisher, Allison Gruber, Patrick Rider, Ken Steinweg
Corresponding Author: Paul DeVita
East Carolina University

12:15 Effect of Age on Shear Modulus of Skeletal Muscle
Kai-Nan An, Zachary Domire, Matthew McCullough
Corresponding Author: Zachary Domire
Mayo Clinic College of Medicine

Podium 5: Computational Biomechanics I
Annenburg Auditorium
Chair: chair

11:15 Experimental evaluation of model-based lower extremity induced accelerations
Yasin Dhaher, Betsy Hunter, Darryl Thelen
Corresponding Author: Betsy Hunter
Northwestern University

11:30 3D Finite element simulation of bone remodelling under the tibial component of an Oxford knee replacement
Harinderjit Gill, Hans Gray, Amy Zavatsky
Corresponding Author: Amy Zavatsky
University of Oxford

11:45 Predicting outcomes of treatment for stiff-knee gait using supervised learning
Scott Delp, Melanie Fox, Jeffrey Reinbolt, Michael Schwartz
Corresponding Author: Jeffrey Reinbolt
Stanford University

12 noon Influence of quadriceps muscle force distributions on cartilage stresses at the patellofemoral joint during running
Gary Beaupre, Thor Besier, Scott Delp, Garry Gold
Corresponding Author: Thor Besier  
Stanford University

12:15  **Stresses on movable core and loads on facets are higher by implanting a cervical artificial disc prosthesis as compared to bone grafting fusion technique - a finite element model study**  
Howard An, Gunnar Andersson, Mozammil Hussain, Raghu Natarajan  
Corresponding Author: Mozammil Hussain  
*Rush University Medical Center*

**Podium 6: Ergonomics and Occ. Biomech. I**  
Cubberly Auditorium  
Chair: chair

11:15  **Movement height affects kinematic variability during fatigue**  
Jonathan Dingwell, Deanna Gates  
Corresponding Author: Deanna Gates  
*University of Texas at Austin*

11:30  **Postural control strategies during prolonged standing: is there a relationship with low back discomfort?**  
Jack Callaghan, Diane Gregory, Erika Nelson-Wong, David Winter  
Corresponding Author: Erika Nelson-Wong  
*University of Waterloo*

11:45  **The effect of friction and arm posture on max pull / push force**  
Thomas Armstrong, Kathryn Dannecker, Na Jin Seo  
Corresponding Author: Na Jin Seo  
*University of Michigan*

12 noon  **Algorithm for identification of running, walking, and standing activity in foot force data**  
Peter Cavanagh, Kerim Genc, Brad Humphreys, Gail Perusek  
Corresponding Author: Brad Humphreys  
*ZIN Technologies*

12:15  **Birth of the super pen: an innovative approach to studying handwriting kinetics**  
Alexander Hooke, Jae Kun Shim  
Corresponding Author: Alexander Hooke  
*University of Maryland*

**Podium 7: Walking**  
Memorial Auditorium  
Chair: chair

1:45  **The anterior-posterior thickness variation of femoral cartilage in the tibiofemoral joint is influenced by the knee flexion angles during walking**  
Thomas Andriacchi, Seungbum Koo, Jonathan Rylander  
Corresponding Author: Seungbum Koo  
*Stanford University*

2:00  **Walking in simulated hyper-gravity**  
Stephen Cain, Daniel Ferris  
Corresponding Author: Stephen Cain  
*University of Michigan*
2:15 **Obstacle crossing behavior is affected by parkinson’s disease**
Thomas Buckley, Chris Hass, Chris Pitsikoulis
Corresponding Author: Chris Hass
*University of Florida*

2:30 **Effect of felt and recognized emotions on gait kinematics**
Elizabeth Crane, Barbara Fredrickson, Melissa Gross
Corresponding Author: Melissa Gross
*University of Michigan*

2:45 **Detecting asymmetries in braced and unbraced limbs**
Elizabeth T. Hsiao-Wecksler, John D. Polk, Karl Rosengren, K. Alex Shorter
Corresponding Author: Elizabeth T. Hsiao-Wecksler
*University of Illinois*

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**Podium 8: Injury**

**Annenburg Auditorium**

Chair: chair

1:45 **Anterior cruciate rupture due to excessive internal torque of the human tibia**
Roger Haut, Eric Meyer
Corresponding Author: Roger Haut
*Michigan State University*

2:00 **Biomechanics of impact loading of goat skull (capra hircus) using ct image based finite element modeling**
Andrew Biewener, Ashkan Vaziri, Edwin Yoo
Corresponding Author: Edwin Yoo
*Harvard University*

2:15 **A three-dimensional nonlinear kinematic finite element model of the human cervical spine under dynamic inertial loading**
Ronald Anderson, Gerald Harris, Richard Hart, Brad Probst, Bradley Probst
Corresponding Author: Bradley Probst
*Tulane University*

2:45 **Female Necks are not Uniformly Scaled Versions of Male Necks**
Jonathan Danaraj, Gunter Siegmund, Anita Vasavada
Corresponding Author: Anita Vasavada
*Washington State University*

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**Podium 9: Sports I**

**Cubberly Auditorium**

Chair: chair

1:45 **The effect of compression pants on postural steadiness before and after tiring exercise**
Gary Heise, Katharine Mack, Minoru Shinohara
Corresponding Author: Gary Heise
*University of Northern Colorado*

2:00 **Changes in spring-mass characteristics during 400m sprint**
Kouki Gomi, Hiroaki Hobara, Kazuyuki Kanosue, Tetsuro Muraoka
Corresponding Author: Hiroaki Hobara
*Waseda University*
2:15  **Trunk muscle activation and low-back loading during the performance of standard and suspended push-up exercises**  
Tyson A.C. Beach, Jack P. Callaghan, Samuel J. Howarth  
Corresponding Author: Tyson A.C. Beach  
*University of Waterloo*

2:30  **Interactive effects of running speed and weight support on metabolic cost and ground reaction forces**  
Alena Grabowski, Rodger Kram  
Corresponding Author: Alena Grabowski  
*University of Colorado, Boulder*

2:45  **Determination of Heading Frequency in Youth Soccer**  
Cynthia Bir, Erin Hanlon  
Corresponding Author: Cynthia Bir  
*Wayne State University*

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**Podium 10: Running  Memorial Auditorium**  
Chair: chair

3:15  **Integrating the mechanical and metabolic energetics of the swing phase of walking and running**  
Richard Marsh, Jonas Rubenson  
Corresponding Author: Jonas Rubenson  
*Northeastern University*

3:30  **Walking, skipping, and running produced from a single bipedal model**  
Arthur Kuo, Shawn O'Connor  
Corresponding Author: Shawn O'Connor  
*University of Michigan*

3:45  **Running stability is enhanced by a proximo-distal gradient in joint mechanics**  
Biewener Andrew, Monica Daley  
Corresponding Author: Biewener Andrew  
*Harvard University*

4:00  **Changing the demand on specific muscle groups affects the walk-run transition speed**  
Jamie Bartlett, Rodger Kram  
Corresponding Author: Jamie Bartlett  
*University of Colorado*

4:15  **Criteria for dynamic similarity in bouncing gaits**  
Sharon Bullimore, Jeremy Burn, Max Donelan  
Corresponding Author: Sharon Bullimore  
*University of Calgary*

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**Podium 11: Upper Extremity  Annenbg Auditorium**  
Chair: chair

3:15  **Upper limb moment-generating capacity in middle aged adults**  
Garry Gold, Katherine Holzbaur, Wendy Murray  
Corresponding Author: Katherine Holzbaur
3:30  **Effect wrist and forearm muscle architecture on wrist radial-ulnar deviation and forearm pronation supination moment**  
Roger Gonzalez, John Ramsay  
Corresponding Author: Roger Gonzalez  
LeTourneau University

3:45  **Glenohumeral joint reaction forces following latissimus tendon transfer**  
Marcus Pandy, Kevin Shelburne, Michael Torry, Takashi Yanagawa  
Corresponding Author: Takashi Yanagawa  
Steadman Hawkins Research Foundation

4:00  **A Three-Dimensional Model of the Supraspinatus Muscle**  
Silvia Blemker, Scott Delp, Joshua Webb  
Corresponding Author: Joshua Webb  
Stanford University

4:15  **Moment arm measurement to validate a closed-loop feedback-controlled elbow joint simulator**  
Mark Baratz, Angela Flamm, Laurel Kuxhaus, Pat Schimoler, Jeffrey Vipperman  
Corresponding Author: Laurel Kuxhaus  
University of Pittsburgh, Allegheny General Hospital

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**Podium 12: Tendon and Ligament**  
Cubberly Auditorium

Chair: chair

3:15  **A technique for determination of transverse material properties of human flexor digitorum tendons**  
Thomas D. Brown, Cheolwoong Ko, M. James Rudert  
Corresponding Author: Thomas D. Brown  
University of Iowa

3:30  **Relationship between knee flexion moment and early cartilage changes in the ACL reconstructed knee**  
Katerina Blazek, Ajit Chaudhari, Seungbum Koo, Sean Scanlan, Joshua Schmidt  
Corresponding Author: Sean Scanlan  
Stanford University

3:45  **The influence of patellar ligament insertion angle on quadriceps usage during walking in acl reconstructed subjects**  
Thomas Andriacchi, Ajit Chaudhari, Chris Dyrby, Choongsoo Shin  
Corresponding Author: Choongsoo Shin  
Stanford University

4:00  **An algorithm for automated tracking of tendon excursion from ultrasound images**  
Sabrina Lee, Gregory Lewis, Stephen Piazza  
Corresponding Author: Stephen Piazza  
The Pennsylvania State University

4:15  **Cruciate ligament force during the wall squat and one-leg squat**  
Rafael Escamilla, Alan Hreljac, Rodney Imamura, Toran MacLeod, Naiquan Zheng  
Corresponding Author: Rafael Escamilla  
California State University, Sacramento
Podium 13: Locomotion Energetics  
Memorial Auditorium  
Chair: chair  
9:45  Disintegrating the metabolic cost of human running: weight support, forward propulsion, and leg swing  
Rodger Kram, Erin Warddrip  
Corresponding Author: Rodger Kram  
*University of Colorado - Boulder*

10:00  Comparison of two methods of determining relative effort during sit-to-stand  
Dennis Anderson, Kathleen Bieryla, Michael Madigan  
Corresponding Author: Kathleen Bieryla  
*Virginia Tech*

10:15  Independent effects of body weight and mass on the metabolic cost of running  
Alena Grabowski, Rodger Kram, Lennart Teunissen  
Corresponding Author: Alena Grabowski  
*University of Colorado, Boulder*

10:30  Mechanics and energetics of level walking with powered ankle exoskeletons  
Daniel Ferris, Gregory Sawicki  
Corresponding Author: Gregory Sawicki  
*University of Michigan-Ann Arbor*

10:45  Center of mass velocity redirection predicts COM work in walking  
Peter Gabriel Adamczyk, Arthur D. Kuo  
Corresponding Author: Peter Gabriel Adamczyk  
*University of Michigan*

Podium 14: Hand  
Annenburg Auditorium  
Chair: chair  
9:45  Comparison of finger force enslaving and sharing between mvf and oscillatory finger force production tasks  
QI LI, Marcio A. Oliveira, Jae Kun Shim  
Corresponding Author: QI LI  
*University of Maryland*

10:00  A data-driven Markov Chain Monte Carlo metropolis-hastings algorithm for a model of the human thumb  
Carlos Bustamante, Veronica Santos, Francisco Valero-Cuevas  
Corresponding Author: Veronica Santos  
*Cornell University & The University of Southern California*

10:15  Modeling of the muscle/tendon excursions in an index finger using the comercial software anybody  
Kai-Nan An, Robert G Cutlip, Ren G Dong, John Z Wu  
Corresponding Author: John Z Wu  
*National Institute for Occupational Safety and Health*

10:30  Variation in force and moment stabilizing synergies with different finger combinations: an uncontrolled manifold analysis  
Sohit Karol, Jae Kun Shim
Corresponding Author: Sohit Karol
University of Maryland, College Park

10:45  **Blind inference of tendon networks through minimal testing**
Hod Lipson, Anupam Saxena, Francisco Valero-Cuevas
Corresponding Author: Anupam Saxena
Cornell University & The University of Southern California

Friday, August 24, 2007  9:45 - 11:00 AM

Podium 15: Knee  Cubberly Auditorium
Chair: chair
9:45  **The effect of collagen fibres on permeability of articular cartilage**
Salvatore Federico, Walter Herzog
Corresponding Author: Salvatore Federico
The University of Calgary

10:00  **Changes in patellofemoral contact pressure due to imbalance of the knee extensors**
Doug Bourne, Walter Herzog, Azim Jihna, Andrew Sawatsky
Corresponding Author: Andrew Sawatsky
University of Calgary

10:15  **Regional variations in the depth-dependent strain distribution in the tibial plateau**
Thomas Andriacchi, Scott Bevill, Paul Briant, Gabriel Sanchez
Corresponding Author: Gabriel Sanchez
Stanford University

10:30  **Decreased knee flexion during landing increases frontal plane loading of the knee**
Christine Pollard, Christopher Powers, Susan Sigward
Corresponding Author: Christine Pollard
University of Southern California

10:45  **3d joint contact forces at the hip, knee, and ankle during running at different stride lengths**
Timothy Derrick, W. Brent Edwards, Joshua Thomas
Corresponding Author: W. Brent Edwards
Iowa State University

Friday, August 24, 2007  11:15 AM - 12:30 PM

Podium 16: Comparative Biomechanics  Memorial Auditorium
Chair: chair
11:15  **A biomechanical study of vertebral allometry in primates**
Leah Anderson, Charles Kunos, Bruce Latimer, David Loomis, Andrew Schifle
Corresponding Author: Andrew Schifle
Case Western Reserve University

11:30  **Effective fields in control muscles: Efficacy of control depends on biomechanical context in an insect**
Robert Full, Chris Mullens, Andrew Spence, Simon Sponberg
Corresponding Author: Simon Sponberg
University of California, Berkeley

11:45  **A hexapedal jointed-leg model for insect locomotion in the horizontal plane**
Philip Holmes, Raghavendra Kukillaya
12 noon Minimal muscle atrophy during hibernation in captive brown bears
John Hershey, David Lin, O. Lynne Nelson, Charles Robbins
Corresponding Author: David Lin
Washington State University

12:15 Functional heterogeneity within and between hind limb muscles during running in guinea fowl
Andrew Biewener, Timothy Higham
Corresponding Author: Timothy Higham
Harvard University

Friday, August 24, 2007 11:15 AM - 12:30 PM

Podium 17: Muscle Mechanics Annenburg Auditorium
Chair: chair
11:15 In vivo sarcomere length measurement by minimally invasive microendoscopy
Robert P. J. Barretto, Scott L. Delp, Michael E. Llewellyn, Mark J. Schnitzer
Corresponding Author: Michael E. Llewellyn
Stanford University

11:30 Force transmission from soleus muscle in the cat; is m. Soleus an independent actuator?
Huub Maas, Thomas G. Sandercock
Corresponding Author: Huub Maas
Northwestern University

11:45 Functional implications of optimal muscle fiber lengths of the ankle plantarflexors
Edith Arnold, Scott Delp, Richard Lieber, Samuel Ward
Corresponding Author: Edith Arnold
Stanford University

12 noon Active and passive force enhancement in rabbit psoas myofibrils
Walter Herzog, Venus Joumaa, Tim Leonard
Corresponding Author: Venus Joumaa
University of Calgary

12:15 Strains in the biceps brachii during dynamic elbow flexion show concentric, eccentric and isometric behavior simultaneously
Brian Knarr, John Novotny, Hehe Zhou
Corresponding Author: John Novotny
University of Delaware

Friday, August 24, 2007 11:15 AM - 12:30 PM

Podium 18: Rehabilitation I Cubberly Auditorium
Chair: chair
11:15 Upper extremity kinematics of crutch-assisted gait in children with myelomeningocele
Gerald Harris, Brooke Slavens, Peter Sturm
Corresponding Author: Brooke Slavens
Marquette University

11:30 Correlation between knee adduction moment and the ratio of medial-to-lateral compartment compression in subjects with knee osteoarthritis undergoing high-tibial osteotomy.
### 11:45 Mechanical vibrations reduce the intervertebral disc swelling and muscle atrophy from bed rest

Harlan Evans, Nilsson Holguin, Jesse Muir, Yi-Xian Qin, Clinton Rubin  
Corresponding Author: Nilsson Holguin  
*Stony Brook University*

### 12 noon Asymmetric stability margin of postural response to perturbation in unilateral transtibial amputees

Lena Ting, Yi-Ying Tsai  
Corresponding Author: Lena Ting  
*Emory University and Georgia Institute of Technology*

### 12:15 Effect of visual uncertainty on adaptation to ankle perturbations

Corresponding Author: Timothy Judkins  
*University of Maryland School of Medicine*

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**Podium 19: Neurorehabilitation**  
**Memorial Auditorium**  
**Chair:** chair

**1:45** Spinal cord injured subjects use ankle-foot load feedback to modulate hip torque during locomotion  
Keith Gordon, Brian Schmit, Ming Wu  
Corresponding Author: Keith Gordon  
*Rehabilitation Institute of Chicago*

**2:00** Motor adaptation during dorsiflexion-assisted walking with a powered orthosis  
Daniel Ferris, Pei-Chun Kao  
Corresponding Author: Pei-Chun Kao  
*University of Michigan*

**2:15** Metabolic costs and walking symmetry of trans-tibial amputees are influenced by prosthetic mass distribution  
Philip Martin, Jeremy Smith  
Corresponding Author: Jeremy Smith  
*Ball State University*

**2:30** Regulating shoulder net joint moments during wheelchair propulsion  
Jill McNitt-Gray, Shashank Raina, Philip Requejo  
Corresponding Author: Shashank Raina  
*University of Southern California*

**2:45** Gait adaptability in people with unilateral trans-tibial amputations in response to variable walking speed and body weight support  
Jason Johanning, Iraklis Pipinos, Nicholas Stergiou, A. Joseph Threlkeld, Clinton Wutzke  
Corresponding Author: A. Joseph Threlkeld  
*Creighton University*
Podium 20: Motor units
Annenburg Auditorium
Chair: chair
1:45  
Detecting the transient recruitment of motor units in the surface electromyogram during a sustained contraction
Roger Enoka, Jane Litsey, Zachary Riley, Mary Terry, Alberto-Mendez Villaneuva  
Corresponding Author: Zachary Riley  
University of Colorado, Boulder

2:00  
Improving models of motor unit function is best done by refining their neural mechanisms
Kevin Keenan, Francisco Valero-Cuevas  
Corresponding Author: Kevin Keenan  
Cornell University & The University of Southern California

2:15  
DTI-based fiber tracking reveals a multifaceted alteration of pennation angle in tibialis anterior muscle upon muscle lengthening
Bruce Damon, Zhaohua Ding, Anneriet Heemskerk, Tuhin Sinha  
Corresponding Author: Anneriet Heemskerk  
Vanderbilt University

2:30  
Maximising the resolution of EMG characteristics from dynamic contractions by combining a muscle model and wavelet analysis
Steph Forrester, Matt Pain  
Corresponding Author: Matt Pain  
Loughborough University

2:45  
The effect of temperature on residual force enhancement in single skeletal muscle fibers
Walter Herzog, Eun-Jeong Lee  
Corresponding Author: Eun-Jeong Lee  
University of Calgary

Friday, August 24, 2007  1:45 - 3:00 PM

Podium 21: Ergonomics and Occ. Biomech. II  
Cubberly Auditorium
Chair: chair
1:45  
Modeling of the dynamic muscle force in an index finger during tapping
Kai-Nan An, Robert G Cutlip, Ren G Dong, Kristine Krajnak, John Z Wu  
Corresponding Author: John Z Wu  
National Institute for Occupational Safety and Health

2:00  
Hammering and dart throwing are kinematically different
Joseph Crisco, Patrick Curran, Douglas Moore, Michael Rainbow  
Corresponding Author: Joseph Crisco  
Brown University

2:15  
Sagittal lumbar intervertebral angles in seated postures using fluoroscopy
Jack Callaghan, Nadine Dunk, Tom Jenkyn, Angela Kedgley  
Corresponding Author: Nadine Dunk  
University of Waterloo

2:30  
Predicting slow changes in muscle fatigue from kinematics
David Chelidze, Jonathan Dingwell, David Segala, Miao Song  
Corresponding Author: Jonathan Dingwell  
University of Texas

2:45  
Modeling 3D knee torque surfaces for males and females
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<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
<th>Speaker(s)</th>
<th>Corresponding Author</th>
<th>Affiliation</th>
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<tr>
<td>3:15</td>
<td><strong>Podium 22: Neuromechanics</strong></td>
<td>Memorial Auditorium</td>
<td>Martha Cammarata, Tobey DeMott, Yasin Dhaher</td>
<td>Martha Cammarata</td>
<td>Northwestern University</td>
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<td>3:30</td>
<td>Visual perturbation of walking balance</td>
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<td>Arthur Kuo, Shawn O'Connor</td>
<td>Shawn O'Connor</td>
<td>University of Michigan</td>
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<tr>
<td>3:45</td>
<td>Effect of neuromuscular resistance training on multi-finger synergy</td>
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<td>Jeffrey Hsu, Sohit Karol, Jae Kun Shim</td>
<td>Jeffrey Hsu</td>
<td>University of Maryland</td>
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<td>4:00</td>
<td>Effects of repetitive drop jumps on lower extremity landing mechanics</td>
<td></td>
<td>Eric Dugan, Holmes Finch, Jeremy Smith, Joshua Weinhandl</td>
<td>Joshua Weinhandl</td>
<td>Ball State University</td>
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<td>4:15</td>
<td>Torque coupling post stroke: implication for gait</td>
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<td>Yasin Dhaher, Theresa Hayes</td>
<td>Theresa Hayes</td>
<td>Northwestern University</td>
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<td>3:15</td>
<td><strong>Podium 23: Muscle</strong></td>
<td>Annenburg Auditorium</td>
<td>Sharon Bullimore, Walter Herzog</td>
<td>Sharon Bullimore</td>
<td>University of Calgary</td>
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<td>3:30</td>
<td>Crouched gait postures reduce the capacity of uni-articular muscles to extend the hip and knee joints</td>
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<td>Scott Delp, Jennifer Hicks, Michael Schwartz</td>
<td>Jennifer Hicks</td>
<td>Stanford University</td>
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<td>3:45</td>
<td>Growth-dependent enhancement of mouse neonatal muscle morphology and contractile function</td>
<td></td>
<td>David Gokhin, Richard Lieber</td>
<td>Richard Lieber</td>
<td>University of California, San Diego</td>
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</table>
4:00 Increased stress production and response to injury in desmin knockout muscles rescued by plasmid transfection
Shannon Bremner, Richard Lieber, Michelle Palmisano
Corresponding Author: Richard Lieber
University of California, San Diego

4:15 EMG characteristics of dynamic knee extensions determined by combined muscle modelling and wavelet analysis
Steph Forrester, Matt Pain
Corresponding Author: Matt Pain
Loughborough University

Podium 24: Rehabilitation II Cubberly Auditorium
Chair: chair
3:15 Effects of UHMWPE surface roughness and lubrication on the frictional properties of total knee replacements
Ryan Landon, Ryan Lucking, Stephen Piazza
Corresponding Author: Stephen Piazza
The Pennsylvania State University

3:30 Point markers versus cluster triads: multi-segment foot model performance is insensitive to the architecture of the reflective markers used in optical motion analysis
Kiersten Anas, Colin Dombroski, Thomas Jenkyn, Shawn Robbins
Corresponding Author: Thomas Jenkyn
University of Western Ontario

3:45 Effect of the knee joint contact path on the quadriceps extension moment during gait
Hannah Lundberg, Valentina Ngai, Andrea Swanson, Markus Wimmer
Corresponding Author: Hannah Lundberg
Rush University Medical Center

4:00 Variability in secondary motions of the knee following total joint replacement
Valentina Ngai, Markus Wimmer
Corresponding Author: Valentina Ngai
Rush University Medical Center

4:15 Gait stability following total hip replacement
Li-Shan Chou, Dennis Collis, Brian Jewett, Virginia Klausmeier, Vipul Lugade
Corresponding Author: Li-Shan Chou
University of Oregon

Podium 25: Aging II Memorial Auditorium
Chair: chair
9:45 Biomechanical modeling to identify risk factors in knee oa: model dependence upon source mri field strength
Donald Anderson, Thomas Brown, Neil Segal, James Torner
Corresponding Author: Donald Anderson
The University of Iowa

10:00 Hip joint moments and bone mineral density in healthy older women
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15</td>
<td>Lateral falls after a slip are affected by medial/lateral slipping foot displacement</td>
<td>Stephanie Donovan, Mark Grabiner, Karen Troy</td>
<td>University of Illinois at Chicago</td>
</tr>
<tr>
<td>10:30</td>
<td>Rapid shoulder flexion after a slip may assist fall avoidance</td>
<td>Stephanie Donovan, Mark Grabiner, Karen Troy</td>
<td>University of Illinois at Chicago</td>
</tr>
<tr>
<td>10:45</td>
<td>Young adults adapt to prevent falls from unpredictable balance disturbances</td>
<td>Michael Pavol, Lisa Welsh</td>
<td>Oregon State University</td>
</tr>
</tbody>
</table>

Saturday, August 25, 2007  9:45 - 11:00 AM

**Podium 26: Computational Biomechanics II**  Annenberg Auditorium

Chair: chair

9:45  Long-duration muscle-actuated simulations of walking at multiple speeds
Frank Anderson, Scott Delp, Eran Guendelman, Jill Higginson, Chand John
Corresponding Author: Chand John
Stanford University

10:00  OPENSIM: an open-source platform for simulating and analyzing musculoskeletal dynamics
Frank (Clay) Anderson, Eran Guendelman, Ayman Habib, Chand John, Peter Loan
Corresponding Author: Frank (Clay) Anderson
Stanford University

10:15  Biomechanical neck model based on the visible human female
Richard Lasher, Linda Rico, Anita Vasavada, Liying Zheng
Corresponding Author: Liying Zheng
Washington State University

10:30  Can a passive dynamic walking robot exhibit a deterministic nonlinear gait?
Chris Arellano, Timothy Judkins, Max Kurz, Melissa Scott-Pandorf
Corresponding Author: Timothy Judkins
University of Maryland School of Medicine

10:45  Simulation insights into experimental techniques for estimating walking stability
Kevin Granata, Anthony Marsh, James Norris
Corresponding Author: James Norris
WFU - VT

Saturday, August 25, 2007  9:45 - 11:00 AM

**Podium 27: Sports II**  Cubberly Auditorium

Chair: chair

9:45  Design of safe ski jump landing surfaces
Mont Hubbard
10:00 Reduced shoe-surface friction can increase the risk of non-contact ACL injury during cutting movements
Todd Alaminit, Thomas Andriacchi, Stefano Corazza, Ariel Dowling, Lars Mundermann
Corresponding Author: Ariel Dowling
Stanford University

10:15 Regulation of reaction forces during the impact phase of landings
Henryk Flashner, Jill Mcnitt-Gray, Joseph Munaretto
Corresponding Author: Joseph Munaretto
University of Southern California

10:30 The influence of maturation and lower extremity kinetics on swing limb foot velocity in young females during a soccer kick
Mark Lyle, Christine Pollard, Christopher Powers, Susan Sigward
Corresponding Author: Mark Lyle
University of Southern California, Los Angeles, CA

10:45 Roles of leading and trailing arms in baseball bat swing
Richard Hinrichs, Young-Kwan Kim
Corresponding Author: Young-Kwan Kim
Arizona State University

11:15 Enhanced inter-joint reflex coupling may contribute to impaired coordination in hemiparetic stroke
Yasin Dhaher, James Finley, Eric Perreault
Corresponding Author: James Finley
Northwestern University

11:30 Quantifying stretch reflex contributions to multijoint coordination following stroke
Eric Perreault, Vengateswaran Ravichandran, Randy Trumbower
Corresponding Author: Randy Trumbower
Rehabilitation Institute of Chicago & Northwestern University

11:45 Movement stability is affected by muscle fatigue
Jonathan Dingwell, Deanna Gates
Corresponding Author: Deanna Gates
University of Texas at Austin

12 noon Stability criteria reduce neuromuscular redundancy in postural control
Nathan E. Bunderson, Thomas J. Burkholder, Lena H. Ting
Corresponding Author: Nathan E. Bunderson
Georgia Institute of Technology

12:15 Cortical networks for controlling instabilities in dexterous manipulation
Chad Lau, Kristine Mosier, Francisco J. Valero-Cuevas, Madhusudhan Venkadesan, Yang Wang
Corresponding Author: Madhusudhan Venkadesan
Cornell University, The University of Southern California & Indiana University
Podium 29: Methods II
Annenburg Auditorium
Chair: chair

11:15  Tracking the position of insole pressure sensors during walking and running
Elizabeth Chumanov, Christian Remy, Darryl Thelen
Corresponding Author: Elizabeth Chumanov
University of Wisconsin - Madison

11:30  Automatic generation of a subject specific model for accurate markerless motion capture and biomechanical applications
Thomas Andriacchi, Stefano Corazza, Emiliano Gambaretto, Lars Mndermann
Corresponding Author: Stefano Corazza
Stanford University

11:45  In vivo knee loading measured by an instrumented total knee replacement during activities of daily living
Thomas Andriacchi, Cliff Colwell, Darryl D'Lima, Chris Dyrby, Anne Muendermann
Corresponding Author: Chris Dyrby
Stanford University

12 noon  Temporomandibular joint kinematics in osteoarthritic patients pre- and post-surgery: The combination of electromagnetic motion data with patient-specific CT images
Kai-Nan An, Evre Baltali, Eugene Keller, Matthew Koff, Kristin Zhao
Corresponding Author: Kristin Zhao
Mayo Clinic

12:15  A novel method for patient specific finite element mesh development of the spine
Nicole Grosland, Nicole Kallemeyn, Kiran Shivanna
Corresponding Author: Nicole Grosland
The University of Iowa

Podium 30: Bone II
Cubberly Auditorium
Chair: chair

11:15  Subject specific geometry reconstruction of knee bones
Alidad Amirfazli, Anthony Au, Jason Carey, Adrian Liggins, James Raso
Corresponding Author: Alidad Amirfazli
University of Alberta

11:30  Compressive properties of trabecular bone in the distal femur
Travis Burgers, Jim Mason, Glen Niebur, Heidi Ploeg
Corresponding Author: Travis Burgers
University of Wisconsin-Madison

11:45  Displaced soft tissue volume as a metric of comminuted fracture severity
Donald Anderson, Thomas Brown, J Lawrence Marsh, Thaddeus Thomas
Corresponding Author: Thaddeus Thomas

12 noon  Determining site-specific bone loss in mice
Brandon Ausk, Ted Gross, Philippe Huber, Sundar Srinivasan
Corresponding Author: Brandon Ausk
University of Washington
12:15  **A biomechanical comparison of an all-locked vs. Hybrid screw configuration of proximal tibial plates**  
Kristine Csavina, Chris Estes, David Jacofsky, Wade Shrader  
Corresponding Author: Kristine Csavina  
SHRI-CORE Orthopedic Research Labs

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### Thursday, August 23, 2007 | 4:30 - 6:15 PM

**Poster Session 1: Skeletal Tissue**  
Memorial Auditorium

**P1-1**  
Transverse damage and failure behavior of trabecular bone  
Jaqueline Keilty, Glen Niebur, Constance Slaboch  
Corresponding Author: Glen Niebur  
University of Notre Dame

**P1-2**  
A calibration method for stereo fluoroscopic imaging systems  
J. Erik Giphart, Bart Kaptein, Kevin Shelburne, Michael Torry  
Corresponding Author: J. Erik Giphart  
Steadman-Hawkins Research Foundation, Vail, CO

**P1-3**  
A finite element analysis of femoral stresses in a simulated falling on the hip condition  
Kevin E. Bennet, Mark E. Bolander, Dan M. Dragomir-Daescu, Sean McEligot, Miranda N. Shaw  
Corresponding Author: Dan M. Dragomir-Daescu  
Mayo Clinic Division of Engineering

**P1-4**  
The effect of loading rate on porcine lumbar spinal segments: an in-vitro biomechanical study  
Kornelia Kulig, Gadi Pelled, John Popovich, Wafa Tawackoli, Judson Welcher  
Corresponding Author: John Popovich  
University of Southern California

**P1-5**  
Stresses in the L2 vertebra under different loading conditions  
Ibrahim Erdem, Eric Truumees, Marjolein C.H. van der Meulen  
Corresponding Author: Marjolein C.H. van der Meulen  
Cornell University

**P1-6**  
Refinements in modeling the mechanical properties of laryngeal soft tissue  
Eric Hunter, Ingo Titze  
Corresponding Author: Eric Hunter  
National Center for Voice and Speech; Denver Center for the Performing Arts

**P1-7**  
Non-rigid registration of deformable shape models produces a superior normative femur model  
Weidong Luo, Frances Sheehan, Steven Stanhope  
Corresponding Author: Weidong Luo  
Catholic University of America

**P1-8**  
Difference in biomechanical properties between a cervical pedicle screw construct and lateral mass cervical fixation  
Brad Dunlap, Eldin Karaikovic, Hyung-Soon Park, Li-Qun Zhang  
Corresponding Author: Li-Qun Zhang  
Rehabilitation Institute of Chicago

**P1-9**  
Effect of facet arthroplasty on the biomechanics of the lumbar spine - a finite element study  
Jorge Ochoa, David Rosler, Sasidhar Vadapalli  
Corresponding Author: Sasidhar Vadapalli  
Archus Orthopedics Inc.,
P1-10 Bone surface tracking for standing knee MRI: a validation study
Peter Barrance, Joaquin Barrios, Irene Davis, Brian Noehren, Michael Pohl
Corresponding Author: Peter Barrance
Kessler Medical Rehabilitation Research and Education Center

P1-11 Carpal cartilage thickness mapping using micro-CT
Jane Casey, Joseph Crisco, Douglas Moore
Corresponding Author: Douglas Moore
Department of Orthopaedics, Brown Medical School/RI Hospital

P1-12 Effects of labrum thickness and modulus on glenohumeral capsule and labrum strains
Richard Debski, Nick Drury, Ben Ellis, Jeff Weiss
Corresponding Author: Jeff Weiss
University of Utah

P1-13 Effects of area selection choice on quantifying proximal tibia bone density
David Hudson, Todd Royer
Corresponding Author: Todd Royer
University of Delaware

P1-14 Biomechanics of the prodisc artificial disc using finite element analysis
Yabo Guan, Dennis J. Maiman, Frank A. Pintar, Narayan Yoganandan, Jiangyue Zhang
Corresponding Author: Yabo Guan
Medical College of Wisconsin

P1-15 Strand-based Simulation of Tendinous Systems
Dinesh K. Pai, Shinjiro Sueda
Corresponding Author: Shinjiro Sueda
University of British Columbia

P1-16 Accuracy of radiographic intervertebral kinematics as a determinant of lumbar fusion
Bruce Fredrickson, Nathaniel Ordway, Soo-An Park, Mike Sun, Hansen Yuan
Corresponding Author: Soo-An Park
SUNY-Upstate Medical University

P1-17 A novel approach to design knee implants for wear and stress shielding performance
Alidad Amirfazli, Anthony Au, Il Yong Kim, Ryan Willing
Corresponding Author: Il Yong Kim
Queen’s University

P1-18 3.5 mm Lag Screws as Compared With 6.5 mm Lag Screws for Fixation of the Distal Femur: Implications for Reconstruction of Complex Joint Injuries
Kristine Csavina, Anjali Gupta, David Jacofsky, John McCamley, M. Wade Shrader
Corresponding Author: Kristine Csavina
SHRI-CORE Orthopedic Research Labs, Sun City West, AZ

P1-19 An in vivo 3d articular model of the radioscaphocapitate (RSC) ligament during wrist flexion/extension and ulnar/radial deviation
Edward Akelman, Joseph Crisco, Douglas Moore, Michael Rainbow, Scott Wolfe
Corresponding Author: Joseph Crisco
Department of Orthopaedics, Brown Medical School/Rhode Island Hospital

P1-20 North American Perception of the Prestige of Biomechanics Serials
John Chow, Duane Knudson
Corresponding Author: Duane Knudson
California State University, Chico
Fatigue induced damage in cemented total hip arthroplasty can be investigated by acoustic emission
Jihui Li, Gang Qi
Corresponding Author: Jihui Li
Columbia University

Finite element parameters affecting micromotion and strain energy density predictions in tibial model as determined by factorial analysis
Michael Dunbar, Adam Henderson, Heidi Ploeg, Jill Schmidt
Corresponding Author: Jill Schmidt
University of Wisconsin-Madison

The influence of using one or two lag screws on the mechanical environment of a femoral neck fracture.
Chris Brown, Philip Procter, David Simpson, Alan Yettram
Corresponding Author: David Simpson
University of Oxford

The effect of using modular necks with an uncemented hip stem on primary stability
Harinderjit Gill, Paige Little, David Simpson
Corresponding Author: David Simpson
University of Oxford

Polyethylene stresses in Unicompartmental knee replacements during a step-up activity.
Harinderjit Gill, David Simpson
Corresponding Author: David Simpson
University of Oxford

Dynamic Loading and Biological Growth
Samer Adeeb, Marcelo Epstein, Walter Herzog
Corresponding Author: Samer Adeeb
University of Calgary

The effect of bone microstructure on microcracks propagation trajectory
Ahmad Reza Arshi, Mohamad Reza Eslami, Hamid Reza Katoozian, Manssour Moeinzadeh, Ahmad Raeisi Najafi
Corresponding Author: Manssour Moeinzadeh
University of Illinois at Urbana-Champaign

Biomechanical Effects of Minimally Invasive Treatment for Cervical Spondylotic Myelopathy
Gunnar B.J. Andersson, Lacey E. Bresnahan, Richard G. Fessler, Mozammil Hussain, Raghu N. Natarajan
Corresponding Author: Lacey E. Bresnahan
The University of Chicago

Calibration of the ZETOS Bone Loading System
Sylvana Garcia, Heidi Ploeg, Everett Smith
Corresponding Author: Sylvana Garcia
University of Wisconsin Madison

Anisotropic stress analysis of the second metatarsal
Timothy Derrick, W. Brent Edwards, Stacey Meardon, Erin Ward
Corresponding Author: W. Brent Edwards
Iowa State University

In vitro validation of a dynamic finite element tkr model
Randy Ellis, Joel Lanovaz
Corresponding Author: Joel Lanovaz
University of Saskatchewan

P1-32 Joint loads and bone strains associated with a resurfaced femoral head
Donald L. Bartel, Christopher T. Cheng, Jason P. Long
Corresponding Author: Jason P. Long
Cornell University

P1-33 The evaluation of tribological properties of biomaterials used for knee replacements
Radek Sedlacek, Jana Vondrova
Corresponding Author: Radek Sedlacek
Czech Technical University in Prague, Faculty of Mechanical Engineering

P1-34 Marrow space used for high resolution image segmentation of cancellous and cortical bone
Robert Burden, Michael Voor, Seid Waddell, Qian Xu
Corresponding Author: Qian Xu
University of louisville

P1-35 A Finite Element Investigation into the Biomechanical Effects of Minimally Invasive Treatment for Cervical Spondylotic Myelopathy
Gunnar B.J. Andersson, Lacey E. Bresnahan, Richard G. Fessler, Mozammil Hussain, Raghu N. Natarajan
Corresponding Author: Lacey E. Bresnahan
The University of Chicago

P1-36 Effects of ACL Interference Screws on Articular Cartilage Thickness Measurements with 1.5T and 3T MRI
Megan Bowers, Braden Fleming, Evan Leventhal, Nhon Trinh, Glenn Tung
Corresponding Author: Braden Fleming
Brown Medical School/Rhode Island Hospital

P1-37 Can height loss across a functional spinal unit modified by static rest breaks mitigate cumulative compression induced injury?
Jack P. Callaghan, Robert J Parkinson
Corresponding Author: Robert J Parkinson
University of Waterloo

P1-38 Ankle angle and localized muscle fatigue effects on tibial response during heel impacts
DAVID ANDREWS, ADRIANA HOLMES
Corresponding Author: ADRIANA HOLMES
UNIVERSITY OF WINDSOR

P1-39 Biomechanics of adjacent segments with number of inter-body bone grafts and spinal intrumentations for a multi-level fusion construct using a finite element model
Howard An, Gunnar Andersson, Mozammil Hussain, Ahmad Nassr, Raghu Natarajan
Corresponding Author: Mozammil Hussain
Rush University Medical Center

P1-40 Relationship between failure progression in a lumbar disc and manual lifting - a poroelastic finite element model study
Howard An, Gunnar Andersson, Steve Lavender, Raghu Natarajan
Corresponding Author: Raghu Natarajan
Rush University of Medical Center

P1-41 Finite element simulation of nanoindentation tests for cortical bone using a damaged plastic model
Satya Paruchuru, Xuanliang Dong, Xiaodu Wang
Corresponding Author: Xuanliang Dong
University of Texas at San Antonio

P1-42  Mechanical Testing of Tendon in Transverse Compression
C. Paul Buckley, S.T. Samuel Salisbury, Amy B. Zavatsky
Corresponding Author: Amy B. Zavatsky
University of Oxford

Thursday, August 23, 2007  4:30 - 6:15 PM
Poster Session 2: Aging  Memorial Auditorium
P2-1  Effects of age and loss of balance direction on the kinematics of the threshold of balance recovery
Cecile Smeesters, Alessandro Telonio
Corresponding Author: Cecile Smeesters
Universite de Sherbrooke

P2-2  Stair descent knee power changes following minimally invasive computer navigated total knee arthroplasty
Kristine Csavina, David Jacofsky, John McCamley, M. Wade Shrader
Corresponding Author: John McCamley
SHRI-CORE Orthopedic Research Labs, Sun City West, AZ

P2-3  Dynamic Postural Stability during Sit-to-Walk Transitions in the Healthy Young and Healthy Elderly
Thomas Buckley, Chris Hass, Chris Pitsikoulis
Corresponding Author: Thomas Buckley
Georgia Southern University

P2-4  Effect of Parkinson's Disease on Step Response to a Backwards Pull
Carl Luchies, Kelly Lyons, Molly McVey, Rajesh Pahwa, Antonis Stylianou
Corresponding Author: Carl Luchies
The University of Kansas

P2-5  Passive and active contributions to joint kinetics in elderly gait
Bryan Heiderscheit, Amy Silder, Darryl Thelen, Ben Whittington
Corresponding Author: Amy Silder
University of Wisconsin - Madison

P2-6  Altered Response to a Backwards Pull in Parkinson's Disease.
Carl Luchies, Kelly Lyons, Molly McVey, Rajesh Pahwa, Antonis Stylianou
Corresponding Author: Carl Luchies
University of Kansas

P2-7  Age and Fatigue Effects on Lower Extremity Joint Torque Development
Gregory King, Carl Luchies, Molly McVey, Antonis Stylianou
Corresponding Author: Gregory King
University of Missouri - Kansas City

P2-8  Separating the Influence of Age and Speed on Gait Variability
Jonathan Dingwell, Hyun Gu Kang
Corresponding Author: Jonathan Dingwell
University of Texas at Austin

P2-9  Pad causes alterations in the variability of gait patterns
Jason Johanning, Naomi Kochi, Sara Myers, Iraklis Pipinos, Nick Stergiou
Corresponding Author: Sara Myers
University of Nebraska at Omaha
P2-10 Center of Mass and Ankle Inclination Angles during Walking: An Alternative Detection of Gait Instability
Chu-Jui Chen, Li-Shan Chou
Corresponding Author: Li-Shan Chou
University of Oregon

P2-11 Cruciate ligament removal contributes to abnormal knee motion during posterior stabilized total knee arthroplasty
Melinda Cromie, Scott Delp, Nicholas Giori, Robert Siston
Corresponding Author: Melinda Cromie
Stanford University

Thursday, August 23, 2007 4:30 - 6:15 PM

Poster Session 3: Motor Control Memorial Auditorium
P3-1 Muscle synergies for human postural control are robustly used across multiple postural configurations
Lena Ting, Gelsy Torres-Oviedo
Corresponding Author: Lena Ting
Emory University and Georgia Institute of Technology

P3-2 Solutions of a redundant motor task with sub-task conflict
Jaebum Park, Jae Kun Shim
Corresponding Author: Jaebum Park
University of Maryland

P3-3 Bidirectional neural coupling between upper and lower limbs
Daniel Ferris, Helen Huang
Corresponding Author: Helen Huang
University of Michigan

P3-4 Changes in the postural control system following localized muscle fatigue: a time-delayed stability analysis
Bradley Davidson, Michael Madigan, Maury Nussbaum
Corresponding Author: Bradley Davidson
Virginia Tech

P3-5 Electromyographic correlates of internal models of target reaching tasks in randomized force fields
Wen Liu, Mukul Mukherjee
Corresponding Author: Mukul Mukherjee
University of Kansas Medical Center

P3-6 Processing effects on joint moments during impact landings
Jeffery Podraza, Scott White
Corresponding Author: Scott White
University at Buffalo

P3-7 Presentation of target torque level and error information enhance maximal voluntary elbow flexion torque
Makoto Fukuda, Tetsuo Fukunaga, Yasuo Kawakami, Yohei Takai
Corresponding Author: Makoto Fukuda
Waseda University

P3-8 A non-linear analysis of kinematic variability during cyclic reach-and-point movements.
Robert Gregory, David Heller
Corresponding Author: Robert Gregory
United States Military Academy

P3-9 Modelling static force generation of rat hindlimb muscles by direct stimulation
Dinesh Pai, Matthew Tresch, Sang Hoon Yeo
Corresponding Author: Matthew Tresch
Northwestern University

P3-10 Critical time-to-contact after postural perturbations
Graham Caldwell, Catherine Gariepy, Christopher Hasson, William McDermott, Richard Van Emmerik
Corresponding Author: Christopher Hasson
University of Massachusetts

P3-11 Adaptations to task mechanics alter stretch reflex gain but not intermuscular coordination
Kuifu Chen, Gwyn Lewis, Eric Perreault
Corresponding Author: Eric Perreault
Northwestern University

P3-12 Effect of surface compliance on stepping responses to trunk perturbations
James Ashton-Miller, Manuel Hernandez
Corresponding Author: Manuel Hernandez
University of Michigan

P3-13 The optimal release angles of elite discus throwers
Steve Leigh, Hui Liu, Bing Yu
Corresponding Author: Steve Leigh
The University of North Carolina at Chapel Hill

P3-14 Switching Control to Actuate Elbow Motion
Daniel Budny, Angela Flamm, Laurel Kuxhaus, Pat Schimoler, Jeffrey Vipperman
Corresponding Author: Pat Schimoler
University of Pittsburgh

P3-15 Stabilization of locomotion by a musculoskeletal model of cat hindlimbs with hill-type actuators
Alexander Klishko, Boris Prilutsky
Corresponding Author: Boris Prilutsky
Georgia Institute of Technology

P3-16 Rambling-trembling decomposition in two dimensions
Marcos Duarte, Mark Latash, Thomas Robert, Vladimir Zatsiorsky
Corresponding Author: Thomas Robert
The Pennsylvania State University

P3-17 Angular momentum control of forward dynamic walking
Mark Able, Bradford Bennett, Alexandre Ledoux, Shawn Russell, Pradip Sheth
Corresponding Author: Bradford Bennett
University of Virginia

P3-18 Examination of cutting knee mechanics using principal components analysis
Michael Bottum, Kristian O'Connor
Corresponding Author: Kristian O'Connor
University of Wisconsin - Milwaukee

P3-19 Joint moments are coordinated to stabilize vertical endpoint forces during human locomotion
Young-Hui Chang, Jasper Yen
Corresponding Author: Jasper Yen
Georgia Institute of Technology

P3-20 Selecting among Neuromechanical Control Architectures using Kinematic Phase and perturbation experiments
Robert Full, Daniel Koditschek, Shai Revzen  
Corresponding Author: Shai Revzen  
University of California, Berkeley  

P3-21  Mechanics of bipedal running turns  
Devin Jindrich  
Corresponding Author: Devin Jindrich  
Arizona State University  

P3-22  Test-retest reliability of sitting posture in typically developing infants.  
Joan Deffeyes, Stacey DeJong, Regina Harbourne, Anastasia Kyvelidou, Wayne Stuberg  
Corresponding Author: Anastasia Kyvelidou  
University of Nebraska at Omaha  

P3-23  Neuromechanical Modeling of Functional Muscle Synergies for Postural Control in the Cat  
J. Lucas McKay, Lena H. Ting, Gelsy Torres-Oviedo  
Corresponding Author: Lena H. Ting  
Georgia Institute of Technology and Emory University  

P3-24  Muscle function is biased towards positive over negative work in level human gait  
Paul DeVita, Allison Gruber, Lars Janshen, Patrick Rider, Stanislaw Solnik  
Corresponding Author: Paul DeVita  
East Carolina University  

P3-25  Upper and Lower Limb Disturbance Rejection of Self-Triggered and Computer-Cued Load Perturbations  
Kari Danek, Daniel Ferris, Brent Gillespie, Jessy Grizzle  
Corresponding Author: Kari Danek  
University of Michigan  

P3-26  Biomechanical Constraints on Equilibrium Point Control of Multi-Joint Arm Postures  
James Gordon, Ning Lan, Dan Song  
Corresponding Author: Ning Lan  
University of Southern California  

P3-27  Lower limb force production and bilateral force asymmetries are based on sense of effort  
Daniel Ferris, Ann Simon  
Corresponding Author: Ann Simon  
University of Michigan  

P3-28  Revisiting the emg-torque relationship of the trunk musculature: effects of antagonistic co-contraction  
Stephen Brown, Stuart McGill  
Corresponding Author: Stephen Brown  
University of Waterloo  

P3-29  Muscular contributions to vertebral joint rotational stiffness during the standard pushup  
Tyson Beach, Jack Callaghan, Samuel Howarth  
Corresponding Author: Samuel Howarth  
University of Waterloo  

P3-30  Muscle activation patterns change the inherent stiffness of the human trunk  
Stephen Brown, Stuart McGill  
Corresponding Author: Stephen Brown  
University of Waterloo  

P3-31  Joint Kinetic Contributions to Acute Performance Enhancement & Degradation  
Loren Chiu, George Salem
Corresponding Author: Loren Chiu
University of Southern California

P3-32 Gender Differences in Spinal Posture and User Positioning on a Prototype Seat Pan
Jack Callaghan, Diana De Carvalho, Nadine Dunk
Corresponding Author: Diana De Carvalho
University of Waterloo

P3-33 Effects of Gender on Lower Extremity Muscle Activation in Children Performing a Single-Leg Unanticipated Landing Task
David Clark, Seth Kuhlman, Ronald Pfeiffer, Michelle Sabick, Kevin Shea
Corresponding Author: Ronald Pfeiffer
Boise State University

P3-34 Effects of breathing on muscle strength of large muscle groups
Adam Borg, Devn Brown, Elizabeth Ikeda, Sheng Li, Jessica Malouf
Corresponding Author: Sheng Li
University of Montana

P3-35 Obstacle avoidance with varying ability to spatially orient attention following mild traumatic brain injury
Robert Catena, Li-Shan Chou, Charlene Halterman, Paul van Donkelaar
Corresponding Author: Li-Shan Chou
University of Oregon

Thursday, August 23, 2007
4:30 - 6:15 PM

Poster Session 4: Injury
Memorial Auditorium

P4-1 Lower Extremity Kinematic Consequences During Vertical to Horizontal Momentum Redirection
Henryk Flashner, Laura Held, Jill McNitt-Gray
Corresponding Author: Laura Held
University of Southern California

P4-2 Factors affecting lumbar kinetics during dependent transfers on an aircraft.
Brian Higginson, Welsh Lisa, Michael Pavol
Corresponding Author: Michael Pavol
Oregon State University

P4-3 Muscle forces at the knee during walking and running in patients with patellofemoral pain
Gary Beaupre, Thor Besier, Garry Gold, Fredericson Michael, Delp Scott
Corresponding Author: Thor Besier
Stanford University

P4-4 The effect of hand position on subscapularis force during the belly-press test
Marcus Pandy, Kevin Shelburne, Michael Torry, Takashi Yanagawa
Corresponding Author: Takashi Yanagawa
Steadman Hawkins Research Foundation

P4-5 Effect of orientation on failure criteria for lumbar spine segments
David Burnett, Naira Campbell-Kyureghyan, Sai Vikas Yalla
Corresponding Author: Naira Campbell-Kyureghyan
University of Louisville

P4-6 Deformation at Branch Points in Human Cerebral Arteries
Louis Cheng, Geoffrey Manley, Kenneth Monson, Joshua Smith
Corresponding Author: Joshua Smith
University of California, San Francisco
P4-7 The influence of stride length on impact shock and metabolic cost during walking in obese women
Joseph Hamill, Elizabeth Russell
Corresponding Author: Elizabeth Russell
University of Massachusetts

P4-8 Spinal mechanics during drop landing: effects of gender and landing technique
John W. Chow, Soo-An Park, Mark D. Tillman
Corresponding Author: Soo-An Park
SUNY-Upstate Medical University

P4-9 A stochastic biomechanical model for the risk and risk factors for non-contact ACL injury
Michael Gross, Chuanshu Ji, Cheng Feng Lin, Paul Weinhold, Bing Yu
Corresponding Author: Bing Yu
The University of North Carolina at Chapel Hill

P4-10 Meniscal Injury in Conjunction with Acute and Chronic ACL Tears Increase Peak Cartilage Stresses
Thomas Andriacchi, Nathan Netravali
Corresponding Author: Nathan Netravali
Stanford University

P4-11 Prospective Study of Kinetic Factors Associated with Tibial Stress Fractures in Runners
Irene Davis, Joseph Hamill, Michael Pohl
Corresponding Author: Michael Pohl
University of Delaware

P4-12 Validation of tri-axial accelerometer for the calculation of elevation angles
Tal Amasay, Andrew Karduna, Laurel Kincl, Keely Zodrow
Corresponding Author: Tal Amasay
University of Oregon

P4-13 Acute torsional failure: do physiological loading rates effect the spine's limit?
Jack Callaghan, Janessa Drake
Corresponding Author: Janessa Drake
University of Waterloo

P4-14 Sagittal ACL graft orientation influences passive and dynamic anterior tibial translation
Katerina Blazek, Ajit Chaudhari, Jason Dragoo, Sean Scanlan, Joshua Schmidt
Corresponding Author: Sean Scanlan
Stanford University

P4-15 Correlation of dynamic cartilage contact stress aberration with severity of joint instability
Thomas Brown, Todd McKinley, Douglas Pedersen, M. James Rudert, Yuki Tochigi
Corresponding Author: Yuki Tochigi
University of Iowa

P4-16 Frontal plane knee joint stiffness: gender and hormonal effects
Martha Cammarata, Tobey DeMott, Yasin Dhaher, Jennifer Moore
Corresponding Author: Yasin Dhaher
Northwestern University

P4-17 Electromyographic and kinematic evaluation of provocative tests for slap lesions
Seth Kuhlman, Kurt Nilsson, Ronald Pfeiffer, Michelle Sabick, Kevin Shea
Corresponding Author: Seth Kuhlman
Boise State University
P4-18 Model for Occupants Ejected from Vehicles with Roll and Yaw
Chad Hovey, Matthew Kaplan, Robert Piziali
Corresponding Author: Chad Hovey
Piziali and Associates, Inc.

P4-19 Evaluation of injury criteria for predicting commotio cordis
Cynthia Bir, Nathan Dau, Mark Link, Christopher Madias
Corresponding Author: Nathan Dau
Wayne State University

P4-20 Prospective Study of the Biomechanical Factors Associated with Patellofemoral Pain
Irene Davis, Brian Noehren
Corresponding Author: Brian Noehren
University of Delaware

P4-21 Glucosamine and chondroitin sulfate affect the response of exercised articular cartilage to blunt impact loading
Nurit Golenberg, Roger Haut, Eugene Kepich, Feng Wei
Corresponding Author: Roger Haut
Michigan State University

P4-22 Biofidelity requirements for an advanced headform for the prediction of eye injuries
Fred Brozoski, Paul Depinet, Stefan Duma, Eric Kennedy
Corresponding Author: Eric Kennedy
Virginia Tech - Wake Forest University Center for Injury Biomechanics

P4-23 The effect of cardiovascular fatigue on trunk muscle activation and spine postures during firefighting tasks
Jack Callaghan, Diane Gregory, Samuel Howarth, Sonia Narula
Corresponding Author: Diane Gregory
University of Waterloo

P4-24 Effect of linear wheelchair velocity on a new manual wheelchair user joint injury index
Mohammadreza Mallakzadeh, Farrokh Sassani, Bonita J Sawatzky
Corresponding Author: Mohammadreza Mallakzadeh
The University of British Columbia

P4-25 Whiplash causes increased laxity of cervical capsular ligament
Marcus Coe, Shigeki Ito, Paul Ivancic, Wolfgang Rubin, Yasuhiro Tominaga
Corresponding Author: Paul Ivancic
Yale University School of Medicine

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Poster Session 5: Rehabilitation Memorial Auditorium
P5-1 Gait Adaptations and Recovery Rates Following Minimally Invasive Total Hip Replacement
Richard Berger, Kharma Foucher, Robert Trombley, Markus Wimmer
Corresponding Author: Markus Wimmer
Rush University Medical Center

P5-2 Functional gait outcomes after intertrochanteric hip fracture
Ellen Boeke, Kristine Csavina, M. Wade Shrader, Kimberly Yarnall
Corresponding Author: Kimberly Yarnall
SHRI-CORE Orthopedic Research Labs, Sun City West, AZ

P5-3 Post-tka effects of prehabilitation on standing knee kinetics
Claudia Angeli, James Doane, John Nyland, Peter Quesada, Ann Swank
Surgical recession of the gastrocnemius for isolated contracture: a case study
Michael Castro, Nicole Chimera, Kurt Manal
Corresponding Author: Kurt Manal
Center for Biomedical Engineering Research, University of Delaware

Assessment of function of an orthotic brace control mechanism
Steven Anderson, Jessica Hagan, William Hnat, John Lilly, Peter Quesada
Corresponding Author: Peter Quesada
University of Louisville

Effects of Wheelchair Propulsion Training on Pushrim Kinetics
Michael Boninger, Rachel Cowan, Alicia Koontz, Ian Rice
Corresponding Author: Alicia Koontz
Human Engineering Research Laboratories

Disease severity influences trunk sway and knee loading during walking in patients with medial compartment knee OA
Thomas P. Andriacchi, Jessica L. Asay, Annegret Muendermann
Corresponding Author: Annegret Muendermann
Stanford University

Reflex and Nonreflex Characterization of Spasticity in Children with Cerebral Palsy: Dependence of Catch Angle on Velocity
Jia-Jin Chen, Deborah Gaebler, Hyung-Soon Park, Yi-Ning Wu, Li-Qun Zhang
Corresponding Author: Li-Qun Zhang
Northwestern University

Can intervertebral kinematics predict clinical outcome of lumbar discectomy?
Jerry Calabrese, Amir Fayyazi, Nathaniel Ordway, Soo-An Park, Hansen Yuan
Corresponding Author: Soo-An Park
SUNY-Upstate Medical University

Lower Limb Synergy Patterns of Stroke Subjects While Walking in a Lokomat Robotic Orthosis
Joseph Hidler, Nathan Neckel, Diane Nichols
Corresponding Author: Nathan Neckel
Catholic University of America

Integer Programming Models for Optimizing Shoulder Rehabilitation
James Carpenter, Christopher Gatti, Richard Hughes, Jason Scibek, Oleg Svintsitski
Corresponding Author: Richard Hughes
University of Michigan

Control System Development for Automatic Standing Balance using Functional Neuromuscular Stimulation (FNS) Following Spinal Cord Injury (SCI)
Musa Audu, Robert Kirsch, Raviraj Nataraj, Ronald Triolo
Corresponding Author: Raviraj Nataraj
Case Western Reserve University

Effect of the lateral wedged insoles on the joint load of knee and ankle in patients with medial knee osteoarthritis
Yuji Kuroyanagi, Hideo Matsumoto, Takeo Nagura, Toshiro Otani, Yasumori Suda
Corresponding Author: Yuji Kuroyanagi
Department of Orthopedic Surgery, Keio University
P5-14 3-d joint motion of ACL deficient and reconstructed knees during daily activities
Bo Gao, Peter Indelicato, Michael Moser, Nigel Zheng
Corresponding Author: Nigel Zheng
University of Florida

P5-15 Is gait after unilateral total knee arthroplasty similar to healthy adults?
Clare Milner
Corresponding Author: Clare Milner
University of Tennessee

Friday, August 24, 2007 4:30 - 6:15 PM
Poster Session 6: Computational Biomechanics Memorial Auditorium

P6-1 Analytical expression of musculotendon model including viscoelastic properties of tendon
Miloslav Vílímek
Corresponding Author: Miloslav Vílímek
Czech Technical University in Prague

P6-2 Influence of loading on knee extensor mechanics in total knee replacement: a computer simulation study
Michael Hast, Ryan Landon, Stephen Piazza
Corresponding Author: Stephen Piazza
The Pennsylvania State University

P6-3 Musculo-Skeletal Modeling Software (MSMS) for Biomechanics and Virtual Rehabilitation
Rahman Davoodi, Mehdi Khachani, Gerald E. Loeb
Corresponding Author: Mehdi Khachani
Alfred Mann Institute and Department of Biomedical Engineering - University of Southern California

P6-4 Criteria for Wrapping Surface Parameters for Spinal Muscles
Richard Lasher, Travis Meyer, Anita Vasavada
Corresponding Author: Anita Vasavada
Washington State University

P6-5 Robust contact spring placement using trimmed nurbs surfaces for simulation of articular contact
Ryan Landon, Stephen Piazza
Corresponding Author: Stephen Piazza
The Pennsylvania State University

P6-6 Validation of Orthopaedic Related Image Segmentation Techniques
Nicole DeVries, Esther Gassman, Nicole Grosland, Nicole Kallmeyn, Kiran Shivanna
Corresponding Author: Nicole Grosland
University of Iowa

P6-7 Three-dimensional hyperelastic model of the human knee: a parametric sensitivity study
Yasin Dhaher, Qunli Sun
Corresponding Author: Yasin Dhaher
Northwestern University and Rehabilitation Institute of Chicago

P6-8 Virtue of Boundary Element Method in Calculation of Pressure Distribution on Boundary Based Segmented Medical Images
Nasser Fatourae, Ali Pashaee
Corresponding Author: Nasser Fatourae
Amirkabir University of Technology

P6-9 A Musculoskeletal Model of the Rat Hindlimb
P6-10  A genetic algorithm approach to singularity avoidance in the analysis of weight lifting performance
Ahmed Reza Arshi, Amir Homayoun Javadi, Manssour Moeinzadeh, Elham Shirzad
Corresponding Author: Manssour Moeinzadeh
University of Illinois at Urbana-Champaign

P6-11  Magnetic resonance image segmentation for biomechanical modeling of the orbit
Joseph L. Demer, Joel M. Miller, Dinesh K. Pai, Qi Wei
Corresponding Author: Qi Wei
Rutgers University

P6-12  Shoulder mechanics: analytical modeling and validation
Noshir Langrana, Sue Ann Sisto, Sarah Sullivan
Corresponding Author: Sarah Sullivan
Rutgers University

P6-13  Forward Dynamics Simulations of Human Gait Using Neuromusculoskeletal Tracking
Hyung Joo Kim, Marcus Pandy, Ajay Seth
Corresponding Author: Ajay Seth
Stanford University

P6-14  Muscle activation, joint position and muscle mass distribution: considerations for musculoskeletal modeling
Timothy Clark, David Hawkins
Corresponding Author: David Hawkins
University of California - Davis

P6-15  A Rigid Body Model of a Lacrosse Shot Underestimates Measured Ball Velocities
Joseph Crisco, Michael Rainbow, Eileen Wang
Corresponding Author: Joseph Crisco
Bioengineering Laboratory, Department of Orthopaedics, Brown Medical School/Rhode Island Hospital

P6-16  Simulation Study of Walking Patterns with Knee Osteoarthritis using opensim
Jill Higginson, Ming Xiao
Corresponding Author: Ming Xiao
University of Delaware

P6-17  A Proposed New Obstacle-Set Algorithm for Modeling the Wrapping Path of Deltoid
Brian Garner, Bo Xu
Corresponding Author: Brian Garner
Baylor University

P6-18  Using Distributions of Forward Dynamic Simulations to Investigate Model Inaccuracies
Matt Camilleri
Corresponding Author: Matt Camilleri
Sacramento City College

P6-19  A novel elastic foundation contact detection algorithm for use in a six degree of freedom knee model
Roger Gonzalez, Nathan Green
Corresponding Author: Roger Gonzalez
LeTourneau University

P6-20  A neuro-musculoskeletal motor control model with somatosensory and vestibular feedback
Kamran Iqbal, Anindo Roy
Patient Specific Finite Element Modeling of Lumbar Vertebrae
Dennis Abernathie, Dirk Alander, Ferris Pfeiffer, Douglas Smith, Carol Ward
Corresponding Author: Ferris Pfeiffer
University of Missouri

Expressing joint axis orientation
Kevin A Ball, Thomas M Greiner
Corresponding Author: Kevin A Ball
University of Hartford

A model of maximum voluntary joint torque variation with joint angle and angular velocity
Dennis Anderson, Michael Madigan, Maury Nussbaum
Corresponding Author: Dennis Anderson
Virginia Tech

Exclusion of the subtalar joint affects significantly the calculated ankle muscle forces during gait.
Friso Hagman, Ilse Jonkers, Gerlinde Lenaerts, Louis Peeraer, Jos Vander Sloten
Corresponding Author: Ilse Jonkers
Katholieke Universiteit Leuven

Reliability of Lower Extremity Anthropometric Measures and Their Effect on Wobbling Mass Tissue Predictions
David Andrews, Timothy Burkhart, Katherine Teigrob
Corresponding Author: Timothy Burkhart
University Of Windsor

Bayesian techniques improve human motion estimation
Friedl De Groote, Tinne De Laet, Joris De Schutter, Ilse Jonkers
Corresponding Author: Friedl De Groote
Katholieke Universiteit Leuven

Response-Surface Mapping to Generate Distributions of Forward Dynamic Simulations
Matt Camilleri
Corresponding Author: Matt Camilleri
Sacramento City College

Muscle contributions to body segment mechanical power during able-bodied toe walking
Judith Burnfield, Sara Mulroy, Richard Neptune, Kotaro Sasaki
Corresponding Author: Richard Neptune
Department of Mechanical Engineering, The University of Texas at Austin, Austin, TX

Automated Hexahedral Meshing of Anatomical Structures using Deformable Registration
Ritesh Bafna, Nicole Grosland, Vincent Magnotta
Corresponding Author: Nicole Grosland
The University of Iowa

A new trunk volume representation for geometric body segment models
Genevieve Dumas, Jason Wicke
Corresponding Author: Jason Wicke
Texas A&M University - Commerce

A Check of Mesh Quality
Nicole Grosland, Curtis Lisle, Vincent Magnotta, Steve Pieper, Kiran Shivanna
Corresponding Author: Nicole Grosland  
The University of Iowa

P6-32  Patient-specific orthopaedic surgical planning: image datasets to fe models  
Nicole M Grosland, Vincent A Magnotta, Kiran H Shivanna, Srinivas C Tadepalli  
Corresponding Author: Srinivas C Tadepalli  
The University of Iowa

P6-33  Determining vertical ground reaction forces without a force platform using a mass-spring-damper model  
Graham Caldwell, Timothy Derrick, Ross Miller  
Corresponding Author: Ross Miller  
University of Massachusetts Amherst

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Poster Session 7: Muscle  
Memorial Auditorium

P7-1  A comparison of force-velocity properties of single muscle fibers obtained under dynamic and steady-state conditions  
Sampath Gollapudi, David Lin  
Corresponding Author: David Lin  
Washington State University

P7-2  Muscle architecture of extensor carpi radialis longus and brevis: a comprehensive volumetric modelling approach  
Anne Agur, Eugene Fiume, Victor Ng-Throw-Hing, Kajeandra Ravichandiran, Karan Singh  
Corresponding Author: Anne Agur  
University of Toronto

P7-3  Emg-based estimates of pennation angle for the primary ankle dorsi and plantarflexors during isometric contractions  
Thomas Buchanan, Kurt Manal, Dustyn Roberts  
Corresponding Author: Kurt Manal  
Center for Biomedical Engineering Research, University of Delaware

P7-4  In vivo examinations of medial gastrocnemius: change of force-generating capacity in stroke survivors  
Fan Gao, Li-Qun Zhang  
Corresponding Author: Li-Qun Zhang  
Rehabilitation Institute of Chicago & Northwestern University

P7-5  Trade-offs in performance associated with muscle fiber type composition  
Brian Umberger  
Corresponding Author: Brian Umberger  
University of Massachusetts Amherst

P7-6  Architecture of the First Dorsal Interosseous Muscle  
John Challis, Daniel Gales, Benjamin Infantolino  
Corresponding Author: Benjamin Infantolino  
Pennsylvania State University

P7-7  Determination of the psoas major muscle thickness by B-mode ultrasonography  
Tetsuo Fukunaga, Yoichi Katsumata, Yasuo Kawakami, Yohei Takai  
Corresponding Author: Yoichi Katsumata  
Waseda University

P7-8  An Unconstrained Workloop Approach to Study Stability in Frog Muscle In Vitro  
Stephen DeWeerth, Kartik Sundar, Lena Ting
Temperature-dependent mechanical properties of human type-i muscle fibers
Sampath Gollapudi, David Lin
Corresponding Author: Sampath Gollapudi
Washington State University

Estimation of myotendinous junction displacement using a cross correlation algorithm for ultra-sound images
Daniel Alves, Liliam Oliveira, Carolina Peixinho, Taian Vieira
Corresponding Author: Liliam Oliveira
Federal University of Rio de Janeiro

Influence of isometric muscle fatigue on the human force-length relationship
Eric Berton, Stuart Binder-Macleod, Thomas Buchanan, Ramu Perumal, Guillaume Rao
Corresponding Author: Guillaume Rao
Department of Mechanical Engineering, University of Delaware

Human lower extremity design: architecture of hip, knee, and ankle muscles
Carolyn Eng, Richard Lieber, Laura Smallwood, Samuel Ward
Corresponding Author: Samuel Ward
University of California San Diego

Scaling of joint mechanics and muscle architecture in the human knee
Jacqueline Braun, Trevor Kingsbury, Kristin Lieber, Samuel Ward, Taylor Winters
Corresponding Author: Samuel Ward
University of California San Diego

The relationship between muscle force and intramuscular pressure during dynamic muscle contractions
Jennifer Davis, Kenton Kaufman, Richard Lieber, Samuel Ward
Corresponding Author: Samuel Ward
University of California San Diego

Cyclic compressive loading facilitates functional and histological recovery following strain induced damage in skeletal muscle
Sudha Agarwal, Thomas Best, Timothy Butterfield, Yi Zhao
Corresponding Author: Timothy Butterfield
The Ohio State University

Continuum-Based Model of Skeletal Muscle
Tammy Haut Donahue, Kenton Kaufman, Duane Morrow, Gregory Odegard
Corresponding Author: Gregory Odegard
Michigan Technological University

Human lower extremity design: architecture of human hamstring and quadriceps muscles
Jacqueline Braun, Carolyn Eng, Trevor Kingsbury, Kristin Lieber, Taylor Winters
Corresponding Author: Kristin Lieber
University of California

The effect of muscle fatigue on correlations in timing errors
Jonathan Dingwell, Deanna Gates
Corresponding Author: Deanna Gates
University of Texas at Austin
P7-19 Evaluation of three methods for determining emg-muscle force parameter estimates for the shoulder muscles
Lisa Case Doro, Christopher Gatti, Richard Hughes, Joseph Langenderfer, Amy Mell
Corresponding Author: Richard Hughes
University of Michigan

P7-20 Effect of glutathione depletion and age on skeletal muscle performance during a chronic stretch-shortening contraction exposure
Brent Baker, Robert Cutlip, Melinda Hollander, Michael Kashon
Corresponding Author: Robert Cutlip
National Institute for Occupational Safety and Health

P7-21 Reliability of Hand-free Ultrasound Measurement for Vastus Medialis Obliquus
Gabriel Ng, Yiu Ming Wong
Corresponding Author: Yiu Ming Wong
Hong Kong Polytechnic University

P7-22 Residual force depression is not abolished following a quick shortening step
Walter Herzog, Timothy Leonard
Corresponding Author: Walter Herzog
University of Calgary

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Poster Session 8: Sports
Memorial Auditorium

P8-1 Stroke resumption following flip turns in swimming
Richard Hinrichs, Bethany Larsen
Corresponding Author: Richard Hinrichs
Arizona State University

P8-2 Cruciate ligament force between the forward lunge long and short with and without a stride
Rafael Escamilla, Alan Hreljac, Rodney Imamura, Toran MacLeod, Naiquan Zheng
Corresponding Author: Rafael Escamilla
California State University, Sacramento

P8-3 Changes in leg stiffness and sprint characteristics during the acceleration phase of running in top sprinters
Tetsuo Fukunaga, Shigeo Iso, Kazuyuki Kanosue, Kai Kobayashi, Hiroyasu Tsuchie
Corresponding Author: Kai Kobayashi
Waseda University

P8-4 Contributions of Passive-Tension vs. Inertial Effects on Gravity Correction for Strength Training
Colleen Delmonaco, Laura Frey Law, Andrea Laake
Corresponding Author: Laura Frey Law
University of Iowa

P8-5 Ground reaction forces between running shoes, racing flats and distance spikes in runners
Iain Hunter, Suzanna Logan
Corresponding Author: Iain Hunter
Brigham Young University

P8-6 The effect of stroke length on active drag in swimming
Richard Hinrichs, Bryan Morrison
Corresponding Author: Bryan Morrison
Valparaiso University & Arizona State University

P8-7 Influence of cycling intensity on running kinematics and electromiography in well trained triathletes
Miguel Fernández del Olmo, Ramón Maanón, Javier Mon, José A. Sánchez, "scar Viana
Corresponding Author: Miguel Fernández del Olmo
Faculty of Sciences of Sport and Physical Education (INEF Galicia)

P8-8  Multi-segment foot kinematics in high- and low-arched females recreational athletes during walking and running
Benjamin Long, Clare Milner, Douglas Powell, Songning Zhang
Corresponding Author: Douglas Powell
The University of Texas of the Permian Basin

P8-9  Lumbar motion during pitching in professional baseball players
Ajit Chaudhari, Christopher McKenzie
Corresponding Author: Ajit Chaudhari
The Ohio State University

P8-10 Dynamic and Static Changes in Foot Shape
Sharna Clark-Donovan, Gordon Valiant
Corresponding Author: Sharna Clark-Donovan
Nike Sport Research Lab

P8-11 Comparison of split double twists and split triple twists in pairs figure skating
Michele Brown, Deborah King, Jean McCrory, Barry Muncasy, Sarah Smith
Corresponding Author: Deborah King
Ithaca College

P8-12 Stepping aerobics: how do the stepping direction and height affect joint kinetics?
Man-Ying Wang, Hsin-Chang Wu
Corresponding Author: Man-Ying Wang
University of Southern California

P8-13 Push up bars and hand position affect upper extremity muscle activity during the push up exercise
Aaron Decker, Siufong Lam, Steven McCaw, Amanda Somers, Mitch Waller
Corresponding Author: Steven McCaw
Illinois State University

P8-14 A mechanical cause of body rotation about the vertical axis in baseball batting
Toshimasa Yanai
Corresponding Author: Toshimasa Yanai
Chukyo University

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Poster Session 9: Locomotion Memorial Auditorium

P9-1 Effects of physical assistance on narrow beam walking
Antoinette Domingo, Daniel Ferris
Corresponding Author: Antoinette Domingo
University of Michigan

P9-2 Walking with Increased Push-off Decreases Hip Flexion Moment
Daniel Ferris, Cara Lewis
Corresponding Author: Cara Lewis
University of Michigan

P9-3 Comparison of the plantarflexion moment arms of lateral gastrocnemius between sprinters and non-sprinters
Sabrina Lee, Stephen Piazza
Corresponding Author: Stephen Piazza  
The Pennsylvania State University  

P9-4 Kinematic correlates of the free moment and combined loads during running  
Timothy Derrick, PhD, William Edwards, Stacey Meardon  
Corresponding Author: Stacey Meardon  
Iowa State University  

P9-5 Mechanics and energetics of incline walking with powered ankle exoskeletons  
Daniel Ferris, Gregory Sawicki  
Corresponding Author: Gregory Sawicki  
University of Michigan-Ann Arbor  

P9-6 In vivo measurement of the inversion-eversion moment arms of gastrocnemius and tibialis anterior  
Sabrina Lee, Stephen Piazza  
Corresponding Author: Stephen Piazza  
The Pennsylvania State University  

P9-7 Functional gait outcomes in stair climbing after intertrochanteric hip fracture  
Ellen Boeke, Kristine Csavina, M. Wade Shrader, Kimberly Yarnall  
Corresponding Author: Kimberly Yarnall  
SHRI-CORE Orthopedic Research Labs, Sun City West, AZ  

P9-8 Estimating lean angle through application of the gravity line projection algorithm  
Elizabeth Hsiao-Wecksler, Pilwon Hur, Seiji Naito  
Corresponding Author: Elizabeth Hsiao-Wecksler  
University of Illinois at Urbana Champaign  

P9-9 An innovative diagnostic tool for reducing traumatic knee injuries  
Brian Armstrong, Michael Bottum, Mustafa Farrah, Kristian O'Connor, Stephen Watts  
Corresponding Author: Kristian O'Connor  
University of Wisconsin - Milwaukee  

P9-10 A functional method for locating the subtalar joint axis: in vivo assessment of accuracy  
Tamara Cohen, Kevin Kirby, Gregory Lewis, Andrea Seisler, Frances Sheehan  
Corresponding Author: Gregory Lewis  
The Pennsylvania State University  

P9-11 Measurement of Ground Reaction Force in Single Limb Support through Markerless Motion Capture  
Thomas Andriacchi, Stefano Corazza  
Corresponding Author: Stefano Corazza  
Stanford University  

P9-12 Finite helical axes of ACL-deficient and ACL-reconstructed knees during walking  
Bo Gao, Nigel Zheng  
Corresponding Author: Nigel Zheng  
University of Florida  

P9-13 A hybrid methodology using ultrasonography and motion analysis for estimation of achilles tendon moment arms in vivo  
Thomas Buchanan, Nicole Chimera, Justin Cowder, Kurt Manal  
Corresponding Author: Kurt Manal  
Center for Biomedical Engineering Research, University of Delaware  

P9-14 Effects of an Elastic Knee Orthosis on Unilateral Hopping  
Michael S. Cherry, Daniel P. Ferris, Sridhar Kota
Corresponding Author: Michael S. Cherry
The University of Michigan

P9-15 Independent effects of weight and mass on muscle activity during walking
Rodger Kram, Craig McGowan, Richard Neptune
Corresponding Author: Craig McGowan
University of Colorado at Boulder

P9-16 Traditional vs continuous data collection for gait evaluation
James Doane, Peter Quesada, Ann Swank, Robert Topp
Corresponding Author: Peter Quesada
University of Louisville

P9-17 Does weight influence locomotive stability?
Christopher J. Arellano, Max J. Kurz, Charles S. Layne, Daniel P. O'Connor, Melissa Scott-Pandorf
Corresponding Author: Christopher J. Arellano
University of Houston

P9-18 Exploring the impulse response of the postural control system
Brett Duiser, Elizabeth Hsiao-Wecksler, Pilwon Hur
Corresponding Author: Elizabeth Hsiao-Wecksler
University of Illinois at Urbana-Champaign

P9-19 Power required to maintain balance on a moving platform
Jerome Allen, Thomas Edwards, Venkata Gade, Nitin Moholkar, David Tung
Corresponding Author: Venkata Gade
Kessler Medical Rehabilitation Research and Education Center

P9-20 Evaluation of the Assessment of Symmetry During Gait
John Chalisi, Daniel Gales
Corresponding Author: Daniel Gales
Pennsylvania State University

P9-21 Estimation of knee joint compression forces in subjects with medial compartment knee osteoarthritis
Jill Higginson, Joseph Zeni, Jr
Corresponding Author: Joseph Zeni, Jr
University of Delaware

P9-22 Static Postural Stability of Individuals with Mental Retardation Before and After Weight and Balance Training
Courtney Haynes, Thurmon Lockhart
Corresponding Author: Courtney Haynes
Virginia Tech

P9-23 Height estimation of an obstacle is scaleable to toe elevation at obstacle crossing
Chris Rhea, Shirley Rietdyk
Corresponding Author: Chris Rhea
Purdue University

P9-24 Sensitivity of functional hip joint center location to body mass index, movement pattern and marker cluster
Valentina Camomilla, Stefano Corazza, Chris Dryby, Priyanshu Gupta, Annegret Muendermann
Corresponding Author: Annegret Muendermann
Stanford University

P9-25 Variability of joint coupling within the lower extremity in runners with patellofemoral pain during a prolonged run
Irene Davis, Tracy Dierks, Joseph Hamill, John Scholz
Corresponding Author: Tracy Dierks
Indiana University

P9-26 Feedforward postural control in standing: role of lateral muscles and body orientation
Alexander Aruin, Marcio Santos
Corresponding Author: Marcio Santos
University of Illinois at Chicago

P9-27 Comparison of Kinematic Methods for Determining Footstrike and Toe-off During Overground Running
Irene Davis, Rebecca Fellin
Corresponding Author: Rebecca Fellin
University of Delaware

P9-28 Energetics and Biomechanics of Walker Assisted Gait
Rodger Kram, Jonathon Priebe
Corresponding Author: Jonathon Priebe
University of Colorado

P9-29 A gait modification to reduce the external adduction moment at the knee: a case study
Joaquin Barrios, Irene Davis
Corresponding Author: Joaquin Barrios
University of Delaware

P9-30 Sensitivity of lyapunov exponent estimation for human gait
Joseph Hamill, Trampas TenBroek, Richard Van Emmerik
Corresponding Author: Trampas TenBroek
University of Massachusetts

P9-31 Older Adults Exhibit Reduced Lateral Acceleration of the Center of Mass at Fast Walking Speeds
Bryan Heiderscheit, Antonio Hernández, Amy Silder, Darryl Thelen
Corresponding Author: Antonio Hernández
University of Wisconsin - Madison

P9-32 Postural control of self-initiated weight shifts in children and adults
James Abbas, Andrea Downing, K Narayanan
Corresponding Author: Andrea Downing
Center for Adaptive Neural Systems, Arizona State University

P9-33 The effects of stepping off vs. Hopping off a box on calculated drop heights in two-legged landings
Mostafa Afifi, Richard Hinrichs
Corresponding Author: Mostafa Afifi
Arizona State University

P9-34 Reducing errors in inverse dynamics-based joint torques through optimized body segment parameters and segment motion profiles
Elizabeth T. Hsiao-Wecksler, Raziel Riemer
Corresponding Author: Raziel Riemer
Ben-Gurion University

P9-35 Effects of attention on dynamic stability of walking
Jonathan Dingwell, Mark Grabiner, Roland Robb, Karen Troy
Corresponding Author: Jonathan Dingwell
University of Texas

P9-36 A mechanism to reduce the knee adduction moment during walking
Thomas Andriacchi, Jennifer Erhart, Anne M_ndermann, Lars M_ndermann  
Corresponding Author: Jennifer Erhart  
Stanford University

P9-37 An Elusive Talus: Re-Thinking the Ankle Complex  
Kevin A Ball, Thomas M Greiner  
Corresponding Author: Kevin A Ball  
University of Hartford

P9-38 Approximate entropy is robust to non-stationarity in analysis of infant sitting postural sway  
Joan Deffeyes, Stacey DeJong, Regina Harbourne, Anastasia Kyvelidou, Wayne Stuberg  
Corresponding Author: Joan Deffeyes  
Biomechanics Laboratory, University of Nebraska at Omaha

P9-39 Accuracies of skin marker based knee motion analysis using different techniques  
Bryan Conrad, Bo Gao, Nigel Zheng  
Corresponding Author: Nigel Zheng  
University of Florida

P9-40 Lower limb local or global asymmetry in gait of people without impairments  
Heydar Sadeghi  
Corresponding Author: Heydar Sadeghi  
Tarbiat Moallem University

P9-41 Contact Stress Elevation with Lateral Talar Shift  
Daniel Fuchs, Tina Maxian, Robert Spilker, Richard Uhl, Jeremy Winston  
Corresponding Author: Tina Maxian  
Eastern Maine Medical Center

P9-42 Importance of Preswing Rectus Femoris Activity  
Allison Arnold, Scott Delp, Melanie Fox, Sylvia Ounpuu, Jeffrey Reinbolt  
Corresponding Author: Melanie Fox  
Stanford University

P9-43 The Effect of Manipulating Subject Mass on Lower Extremity Torque Patterns During Locomotion  
Ronita Cromwell, John De Witt, R Donald Hagan  
Corresponding Author: John De Witt  
Bergall Engineering Services

P9-44 Gait adaptations and high implant twisting moments during stair climbing in subjects with total hip replacements  
Kharma Foucher, Debra Hurwitz, Markus Wimmer  
Corresponding Author: Kharma Foucher  
Rush University Medical Center

P9-45 Origins of the long-range correlations in stride times  
Jonathan Dingwell, Deanna Gates, Jimmy Su  
Corresponding Author: Deanna Gates  
University of Texas at Austin

P9-46 The short-term effect of whole body vibration training on collegiate sprint athletes  
Mike Bishop, Iain Hunter, Brad Roberts, Robert Thiebaud  
Corresponding Author: Iain Hunter  
Brigham Young University

P9-47 How precise is the hip joint centre position found using functional methods?
Richard Good, Julie Stebbins, Tim N. Theologis, Amy B. Zavatsky  
Corresponding Author: Amy B. Zavatsky  
University of Oxford

P9-48 Comparison of Two Alternate Methods for Tracking Toe Trajectory  
Rachel Brady, Chris Miller, Ajitkumar Mulavara, Brian Peters, Liz Warren  
Corresponding Author: Chris Miller  
Wyle Laboratories; Houston, TX

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University of Michigan |

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Corresponding Author: Francisco Valero-Cuevas  
Cornell University

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Corresponding Author: Kenton Kaufman  
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Corresponding Author: Mark L. Latash  
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Corresponding Author: Sang Wook Lee  
Rehabilitation Institute of Chicago

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Corresponding Author: Mark Budgeon
Pennsylvania State University

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Corresponding Author: Kelly Strifling
Marquette University

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Corresponding Author: David Harmer
University of Colorado, Colorado Springs

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Corresponding Author: Xun Niu
The Pennsylvania State University