

## 2012 Northwest Biomechanics Symposium

### PROGRAM

**Friday, May 18, 2012**

- 11:00 – 12:20      **All poster set-up**
- 12:20 – 12:30      Introductory remarks
- 12:30 – 13:30      **Podium Session 1    Modeling/Instrumentation**
- ESSENTIAL TREMOR AND PARKINSON'S DISEASE TREMOR CLASSIFICATION THROUGH MACHINE LEARNING AND NUMERICAL ANALYSIS  
Darnall N, Donovan C, Aktar S Tseng H, Barthelmess P, Cohen P, and Lin D
- WALKING MODE CLASSIFICATION FOR TRANSTIBIAL AMPUTEES FROM MYOELECTRIC SIGNALS  
Miller JD, Seyedali M, and Hahn, ME
- A METHOD FOR COLLECTING CLINICALLY RELEVANT FOOT AND ANKLE X-RAYS ON CADAVERIC SPECIMENS  
Roush GC, Whittaker EC, and Ledoux WR
- A MICROFLUIDIC DEVICE FOR PLATELET AGGREGATE FORCE MEASUREMENT  
Ting LH, Feghhi S, and Sniadecki NJ
- 13:30 – 14:00      Round Table Discussions/Coffee
- 14:00 – 15:15      **Podium Session 2    Neck/Spine/TissueMechanics**
- NECK MUSCULOTENDON STRAINS IN MALES AND FEMALES DURING WHIPLASH  
Blum K, Siegmund GP, Vasavada, A
- BICYCLE HELMET IMPACT TEST METHOD DESIGNED TO INDUCE ROTATIONAL ACCELERATION  
Dau N, Hansen K, Madey S, Bottlang M
- DETERMINING PLANTAR SOFT TISSUE MATERIAL PROPERTIES FROM HYDRAULIC LOADING AND MAGNETIC RESONANCE IMAGING  
Williams ED, Stebbins MJ, Fassbind MJ, Cavanagh PR, Haynor, DR, Chu B, Ledoux WR
- MRI-DERIVED MOMENT ARMS OF NECK MUSCLES DURING SAGITTAL PLANE MOTION  
Suderman BL, Vasavada AN
- DIGITAL IMAGE CORRELATION OF CERVICAL VERTEBRAE IN COMPRESSION  
Gustafson H, Cripton P
- 15:15 – 16:30      Lab Tours
- 16:30 – 17:30      **Poster Session A** (posters and vendors)  
                         **Authors present 4:30-5:00pm Even #; 5:00-5:30pm Odd #**
- 17:30 – 18:00      Pre-Banquet Socializing
- 18:00                Conference Banquet

**Saturday, May 19, 2012**

- 7:00 Group Fun Run: Meet at Phoenix Inn
- 9:00 **ASB Keynote Address: Mark Grabiner, PhD, University of Illinois at Chicago**  
"Reducing the incidence of falls by older adults: I didn't think it would take this long"
- 10:00 – 11:00 **Poster Session B** (posters and vendors) /Coffee Break  
**Authors present 10:00-10:30am Even #; 10:30-11:00am Odd #**
- 11:00 – 12:00 **Podium Session 3 Sports Biomechanics**
- VERTICAL LOAD DISTRIBUTION IN THE METATARSALS DURING SHOD RUNNING  
Becker J, Howey RJ, Osternig L, James, S, Chou, L-S
- CONCUSSION RECOVERY ASSESSMENT UTILIZING DUAL-TASK WALKING AND COMPUTERIZED COGNITIVE TESTS IN HIGH SCHOOL ATHLETES  
Howell D, Osternig L, Chou L-S
- THE ROLE OF FEEDBACK IN THE REGULATION OF GAIT PARAMETERS: A BAREFOOT RUNNING ANALYSIS  
Thompson M, Gutmann A, McGowan C
- KINETICAL ANALYSIS OF THE KNEE JOINT IN FEMALE AND MALE DURING DUMBBELL SQUAT  
Lin J, Liang K, Hsieh L-C, Lin T-Y, Wu H-W
- 12:00 – 13:00 Box Lunch
- 13:00 – 14:00 **Podium Session 4 Balance/Gait**
- EFFECT OF AGE AND BALANCE IMPAIRMENT ON MOVEMENT STRATEGY DURING SIT-TO-WALK  
Chen T, Chou L-S
- CONTROL OF DYNAMIC STABILITY DURING WALKING IN ELDERLY FALLERS  
Fujimoto M, Chou L-S
- PROSTHETIC FOOT COMPONENT STIFFNESS AFFECTS GAIT INITIATION AND TERMINATION OF TRANSTIBIAL AMPUTEES  
Peterson TJ, Roland M, Adamczyk P, Hahn M
- GAIT DIFFERENCE ON STIFFNESS CHANGE SURFACE UNDER ICING LOWER LEG MUSCLE  
Obara A, Takemura H, Mizoguchi H
- 14:00 – 14:15 Coffee Break

**Saturday, May 19, 2012 (continued)**

**14:15 – 15:15          Podium Session 5    Neuromuscular Control**

OPTIMIZATION OF TENDON TRANSFER SURGERY BASED ON HAND BIOMECHANICS  
Mardula L, Balasubramanian R

ENDPOINT INSTRUCTIONS RESULT IN HIGHER PROPRIOCEPTIVE ACUITY THAN JOINT  
ANGLE INSTRUCTIONS  
Hyer JS, Karduna AR

REMOVAL OF PAIN RESULTS IN ALTERED SCAPULAR KINEMATICS AND MUSCLE  
ACTIVATION  
Ettinger L, Shapiro M, Karduna, A

CLINICAL BALANCE MEASURES ARE ASSOCIATED WITH VARIABILITY OF  
INTER-JOINT COORDINATION DURING WALKING IN ELDERLY ADULTS  
Chiu S-L, Chou L-S

15:15 – 15:45          Round Table Discussion

15:45 – 16:00          Award Presentations/Adjourn

## POSTER SESSION A

Friday, May 18, 2012, 4:30-5:30pm

Authors present 4:30-5:00pm Even #; 5:00-5:30pm Odd #

1. ASSOCIATION OF HORMONAL AND MECHANICAL FACTORS OF KNEE OSTEOARTHRITIS FOR WOMEN  
Alvarez A., Hammer J., Jung T., Sheremet J., Casazza, G., Mandeville, D.
2. THIN-BEAM ULTRASOUND OVERSTIMATION OF BLOOD FLOW: HOW WIDE IS YOUR BEAM?  
Buck, T-M, Sieck, D-C, and Halliwill, J-R.
3. HYPERELASTIC MECHANICAL PROPERTIES OF THE HUMAN SUBCALCANEAL FAT PAD: AN INVERSE FINITE ELEMENT ANALYSIS  
Vara Isvilanonda, Shruti Pai, Joseph Iaquinto and William R. Ledoux
4. QUANTIFICATION OF MULTI-SEGMENTAL SPINE MOVEMENT DURING GAIT  
Scott P. Breloff and Li-Shan Chou
5. MODEL NECK STRENGTH SENSITIVITY TO NORMAL VARIATION IN VERTEBRAL KINEMATIC PARAMETERS  
Nevins, D and Vasavada, A
6. EFFECT OF NECK MUSCLE FATIGUE ON HEAD SWAY AND MUSCLE ACTIVITY IN SEATED POSTURE  
Roberts, Kaitlyn and Vasavada, Anita
7. METATARSAL LOADING IN INDIVIDUALS WITH RETROSPECTIVE METATARSAL STRESS FRACTURE  
RJ Howey, James Becker, Li-Shan Chou
8. KNEE KINETICS DURING DECLINE SQUAT AT VARIOUS DECLINE ANGLES  
Huang, C-F, Chen Y-F, Wu H-W
9. GAIT PERFORMANCE WHILE PERFORMING COGNITIVE TASKS CONTINUOUSLY IN CONCUSSED HIGH SCHOOL ATHLETES  
Michael Kado, David Howell, Louis Osternig, and Li-Shan Chou
10. EFFECT OF KINESIO® TAPE APPLICATION ON SHOULDER JOINT POSITION SENSE  
O'Neill, KM and Karduna, A
11. CHANGES IN JOINT KINEMATICS AND KINETICS TO MAINTAIN FASTER RUNNING SPEEDS  
Orendurff, MS, Tulchin, K, Strike, S
12. A NOVEL BICYCLE HELMET DESIGN FOR MITIGATING ROTATIONAL ACCELERATION INDUCED MTBI  
Dau, N, Hansen, K, Madey, S, and Bottlang, M
13. RISK OF INJURY ASSOCIATED WITH PUSHING AND PULLING IN RESIDENTIAL CARE FACILITIES  
Korall, A, Bremner, A, Leong, J, Feldman, F, Robinson, D, Arnold, A, and Robinovitch, S
14. KINEMATIC ANALYSIS OF REACH-TO-GRASP MOVEMENT WHEN NEGOTIATING OBSTACLES OF DIFFERENT HEIGHTS AND DISTANCES IN HIGHLY FUNCTIONING PATIENTS POST-STROKE  
Hong, S.-W.; Mao H.-F.; Tsai, Y.-K.; Huang, S.; Jeng, J.-S. and Lu T.-W.

## POSTER SESSION B

Saturday, May 19, 2012, 10:00-11:00am

Authors present 10:00-10:30am Even #; 10:30-11:00am Odd#

15. FALLS AND THE ELDERLY: JOINT MOMENT DISTRIBUTION IN THE SUPPORT LEG DURING SIT-TO WALK  
Absalon, E., Chen T., Chou, L-S.
16. DO DIMINISHED THERMOREGULATORY CAPACITIES IN THE ELDERLY LEAD TO DECREASED LOWER LIMB TEMPERATURES AND RESULT IN COMPROMISED TRIP RECOVERY?  
Vladimir V. Borisov and David C. Lin
17. NEED TO MEASURE PROPRIOCEPTION? – THERE’S AN APP FOR THAT!  
Elizabeth Gillespie and Andrew Karduna
18. INTERACTIONS BETWEEN TOE CLEARANCE AND ORIENTING OF VISUOSPATIAL ATTENTION: EFFECTS OF OBSTACLE LOCATION  
On-Yee Lo, Li-Shan Chou, Kaitlyn Juth and Paul van Donkelaar
19. ACTIVE CONTROL OF LATERAL BALANCE VARIES WITHIN A STEP  
Andrew Sawers and Michael E. Hahn
20. THE INFLUENCE OF ACTIVE CONTROL ON JOINT POSITION SENSE AT THE ELBOW  
Harding, E and Karduna, A.
21. SHOULDER ORIENTATION AND MOVEMENT DIRECTION, BUT NOT TORQUE ALTER ELBOW JOINT POSITION SENSE  
Tayson Heward, Ismail Raslan, Jacqlyn Hyler and Andrew Karduna
22. HOW UPPER ARM MUSCLES PRE-ACTIVITY AFFECTS THE COMPETITION RESULTS IN ARM WRESTLING  
Wang, L-H , Hong, M-K, Lin, C-Y and Lo, K-C
23. KINETIC ANALYSIS OF THE SHOULDER JOINT DURING PUSH-UP WITH A SWISS BALL  
Wu, Y-L, Chang Y-W, Wu H-W
24. IMAGE REGISTRATION METHOD FOR IMPROVED HR-PQCT BASED DVC  
Gilchrist, S, Guy P and Cripton P
25. USING SETAL MICROMECHANICS TO PREDICT GECKO ADHESIVE PERFORMANCE  
Hagey, T; Puthoff, J; Harmon, L; and Autumn K
26. EFFECT OF A FUNCTIONAL FITNESS EXERCISE PROGRAM ON OBSTACLE NEGOTIATION IN THE ELDERLY  
Li, R-J, Wu, H-W, Chang, Y-W
27. LOWER LIMB SAGITTAL AND FRONTAL JOINT MOMENTS ALTERED BY GRASPING A HANDRAIL DURING STAIR ASCENT  
Chen, S-J and Stergiou N.
28. EFFECT OF FOOT WEDGE POSITIONS ON POSTURAL STABILITY DURING STANDING  
Hamzeh Samimi, Mehrdad Anbaria
29. COMPARISON OF SCAPULAR KINEMATICS IN THREE SHOULDER MOVEMENT PLANES BETWEEN PERSONS WITH AND WITHOUT SHOULDER IMPINGEMENT SYNDROME  
Keshavarz, R and Arab A. M.