

2012

AMERICAN SOCIETY *of* BIOMECHANICS

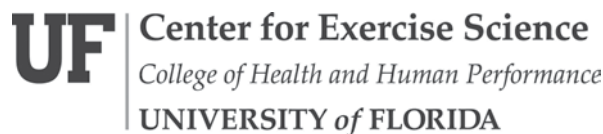
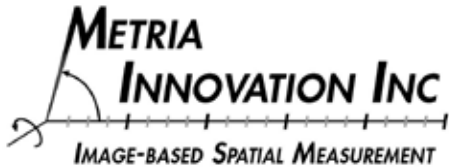
36th Annual Meeting



AUGUST 15-18, 2012
GAINESVILLE, FL

UF | UNIVERSITY of
FLORIDA

A SPECIAL THANK YOU TO OUR 2012 SPONSORS:



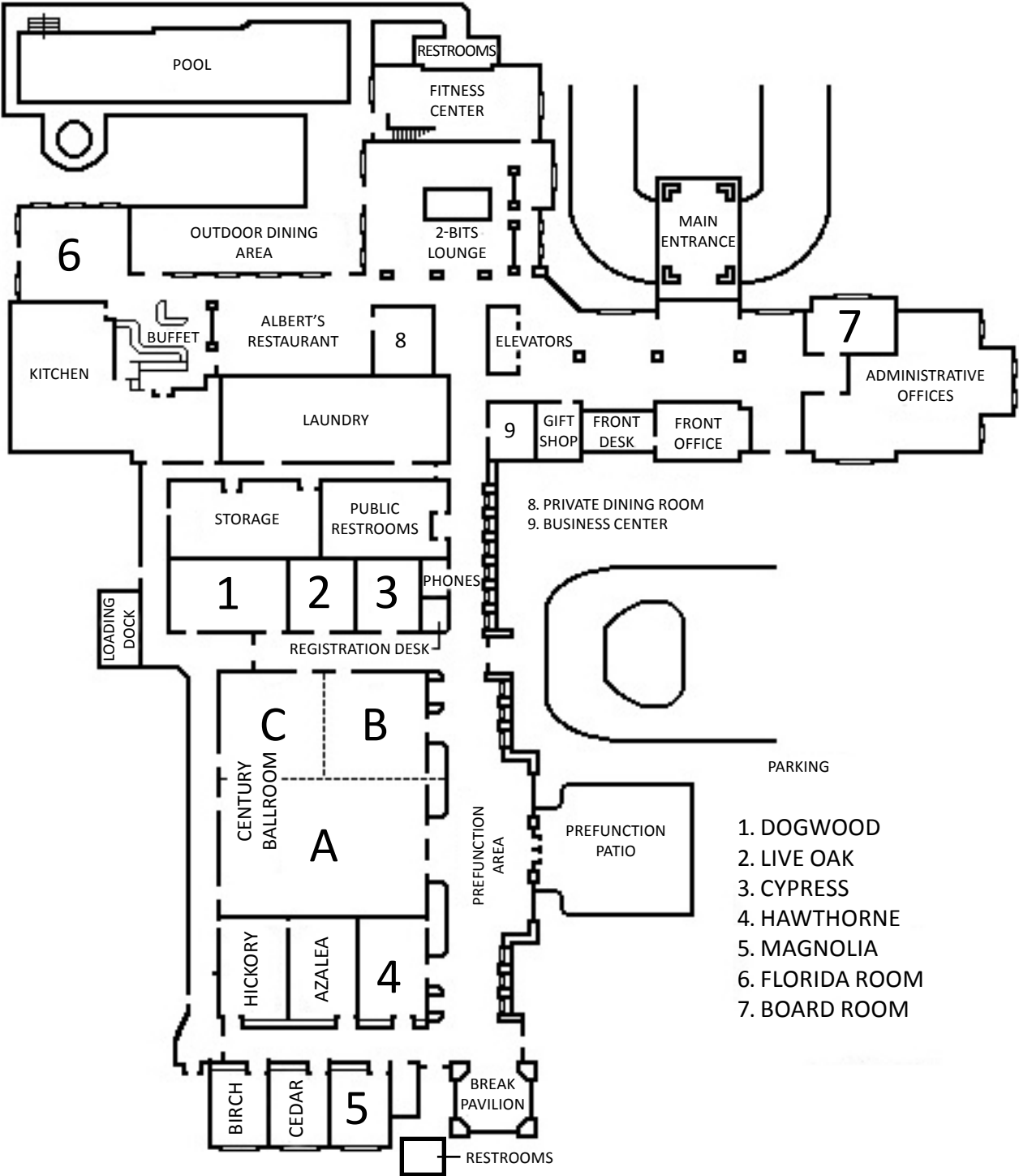
2012

AMERICAN SOCIETY *of* BIOMECHANICS

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HILTON GAINESVILLE | UF CONFERENCE CENTER - MAIN LEVEL



MEETING SCHEDULE OVERVIEW

WEDNESDAY AUGUST 15

10:30 - 12:30

Lab Tour 1

12:30 - 2:30

Tutorial I (Century A)

2:00 - 5:00

ASB Executive Board Meeting

(Board Room)

2:00 - 4:00

Lab Tour 2

2:40 - 3:10

Tutorial II (Century A)

3:20 - 4:20

Tutorial III (Century A)

4:30 - 5:30

Student Speakers (Century A)

5:45 - 7:45

Opening Reception

(Florida Museum of Natural History)

THURSDAY AUGUST 16

7:00 - 8:00

Breakfast (Open seating first floor);

Past Presidents' Breakfast (Albert's Dining Room)

7:45

Opening Remarks (Century A)

8:00 - 9:15

Oral Presentations

- Balance During Locomotion (Century A)
- Tissue Mechanics (Century B)
- Bone (Century C)
- Stroke - Thematic (Azalea)

9:45 - 11:00

Oral Presentations

- ASB Fellows Symposium (Century A)
- Ergonomics (Century B)
- Imaging: Knee (Century C)
- Obesity - Thematic (Azalea)

11:30 - 12:45

Oral Presentations

- Gait 1: Methods (Century A)
- Postural Control (Century B)
- Orthopedics (Century C)
- Journal Awards - Thematic (Azalea)

12:45 - 1:45

Lunch (Open seating first floor);

Diversity Lunch (Florida Room)

2:00 - 3:00

Keynote Lecture - Susan Harkema, Ph.D.

(Phillips Center for the Performing Arts)

3:30 - 6:30

Poster Session 1

(Century A, Dogwood, Hickory, Azalea)

7:00 - 10:00

Banquet & Induction of Fellows

(J. Wayne Reitz Union Grand Ballroom)

FRIDAY AUGUST 17

7:00 - 8:00

Breakfast (Open seating first floor);

Women in Science Breakfast (Two Bits Lounge)

8:00 - 11:00

Poster Session 2

(Century A, Dogwood, Hickory, Azalea)

11:15 - 12:15

Tribute to David Winter, Ph.D., P.Eng.

(Phillips Center for the Performing Arts)

12:30 - 1:30

Lunch (Open seating first floor)

1:30 - 3:15

Oral Presentations

- Aging & Gait Symposium (Century A)
- Motor Control (Century B)
- Muscle 1: Modeling & Behavior (Century C)
- Amputee Gait - Thematic (Azalea)

3:45 - 5:15

Oral Presentations

- Teaching Symposium (Century A)
- Comparative (Century B)
- Sports (Century C)
- Computational Biomechanics (Azalea)

5:30 - 6:30

Borelli Award Lecture - Carlo Deluca, Ph.D.

(Phillips Center for the Performing Arts)

6:30 - 7:30

APTA Networking (Florida Room)

SATURDAY AUGUST 18

7:00 - 8:00

Breakfast (Open seating first floor);

5K Fun Run through UF Campus

8:00 - 9:30

Oral Presentations

- Clinical Gait (Century A)
- Upper Extremity (Century B)
- Knee 1 (Century C)
- Seating Symposium - Thematic (Azalea)

10:00 - 11:15

Oral Presentations

- Gait 2: Analysis (Century A)
- Spine (Century B)
- Knee 2: ACL (Century C)
- Muscle 2: Imaging - Thematic (Azalea)

11:30 - 12:45

(Phillips Center for Performing Arts)

Young Scientist Predoctoral Award - Jacob Elkins;

Young Scientist Postdoctoral Award - Metin

Yavuz, Ph.D.; **James J. Hay Memorial Award**

Lecture - Jesus Dapena, Ph.D.

1:00 - 2:00

Lunch (Open seating first floor);

ASB Business Meeting - Open to All (Century A)

2:00 - 3:30

Oral Presentations

- Falls (Century A)
- Computational Modeling (Century B)
- Running (Century C)
- Powered Exoskeleton & Prosthetics - Thematic (Azalea)

3:45 - 4:15

Closing Ceremony & Awards (Century A)

4:30 - 6:00

ASB Executive Board Meeting - Closed Meeting (Board Room)

WELCOME FELLOW BIOMECHANISTS!

On behalf of the ASB executive board, the University of Florida, and everyone who has contributed to the planning and execution of this meeting, we would like to enthusiastically welcome you to Gainesville, FL. We are excited for the opportunity to host the 36th Annual Meeting of the American Society of Biomechanics.

We are pleased by the continued growth of the ASB annual meeting. In total, 536 abstracts were submitted to this year's meeting from across the United States and the world. Of the submitted abstracts, 169 were selected as presentations (podium and thematic posters) and 332 as traditional poster presentations. In addition, the meeting will feature informative tutorials and symposia, engaging keynote lectures, award presentations, networking opportunities, lab tours, and inaugural research studies with conference attendees. These opportunities will surely make for an enlightening, energizing and productive meeting for all attendees.

The ASB and its Annual Meeting are run exclusively by volunteers. Each year, the tireless efforts of many make it possible for attendees to enjoy a first-rate meeting experience. We would like to thank all of those who have contributed to the planning and implementation of this meeting. In particular, the ASB executive board and the representatives at the University of Florida provided critical guidance and assistance in the planning and organization of the meeting. Abstract reviewers carefully evaluated submissions and many student volunteers donated their time prior to and during the meeting. We greatly appreciate these efforts.

Furthermore, financial support for the meeting has been provided by the following institutions: UF College of Health and Human Performance, UF College of Public Health and Health Professions, UF Center for Exercise Science, Visit Gainesville, UF Center for Movement Disorders and Neurorestoration, Bob and Becky Allen, Institute of Biomedical Imaging and Bioengineering at the National Institutes of Health. And last, but certainly not least, we would like to thank you, the meeting participants, for making this event a worthwhile endeavor. We are confident you will enjoy Gainesville and the planned social activities. We are pleased to welcome you and wish you a wonderful stay.

Sincerely,



Chris Hass
Meeting Co-Chair



Mark Tillman
Meeting Co-Chair



Mark Bishop
Head Local Organizing
Committee



Elizabeth Hsiao-Weckler
Program Chair

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ASB EXECUTIVE BOARD



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ASB PROGRAM COMMITTEE

Kurt Beschorner; Rakie Cham; Glenn Fleisig; Mary Rodgers; Jae Kun Shim; Karen Troy; Brian Umberger

ASSISTANTS TO THE MEETING & PROGRAM CHAIRS

Special thanks to Morgan Boes, David Li, and Matt Petrucci. Special thanks also to Allison Vitt, Rusty Haskell, Curtis Weldon, Andrew Campbell, Jennifer Norse, Matt Denning and Iain Hunter for assistance with conference organization, program development and website construction and maintenance.

MEETING INFORMATION AT A GLANCE

MEETING LOCATIONS

All of the academic meeting events (podium oral presentations, posters, mentoring sessions, etc.) will be held at the Hilton University of Florida Conference Center. The Plenary and Award sessions will be held in the University of Florida Center for Performing Arts. The welcome reception will be at the University of Florida's Museum of Natural History and banquet will be held in the Grand Ballroom of the J. Wayne Reitz Union.

REGISTRATION

The registration desk is located in the lobby of the Hilton University of Florida Conference Center. The registration desk will be staffed on Wednesday from 12 pm to 6 pm, and Thursday and Friday from 7 am to 5 pm.

EXHIBITOR BOOTHS

Exhibitor booths will be located in the Prefunction Area and Hawthorne. See page 56.

ASB EXECUTIVE BOARD/EXHIBITOR'S RECEPTION

Wednesday, August 15, 2012, 4:45-5:30 pm, Two Bits Lounge
Attendance limited to ASB Executive Board, Exhibitor Representatives and Organizers of the 2012 and 2013 Annual Meetings of the ASB.

GENERAL OPENING RECEPTION

Wednesday, August 15, 2012, 5:45 - 7:45 pm, Florida Natural History Museum
Attendance is open to all meeting delegates, staff and exhibitor representatives. See Social Program for details.

POSTER PRESENTATIONS

At least one named author is required to be present at each poster during its designated poster session. Odd-numbered posters will be presented during the first 90 minutes of the session. Even-numbered posters will be presented during the second 90 minutes of the session. Posters can be a maximum of 36" wide x 48" tall (portrait format). Any posters not removed will be discarded. Posters will be mounted on free-standing poster boards or on walls with push pins, which will be provided. **There will be two formal poster sessions:**

POSTER SESSION 1:

THURSDAY, FROM 3:30 - 6:30 PM

(Posters must be mounted by 3:15 pm and removed by 6:45 pm.)

Azalea meeting room: Thematic posters from Stroke, Obesity and Journal Awards

Hickory meeting room: Bone (Posters 1-5); Cell & Tissue Mechanics (Posters

7-12); Muscle (Posters 13-16); and Imaging (17-24)

Dogwood meeting room: Orthopedics (Posters 25-36) and Computational Modeling (Posters 37-50)

Ballroom A: Methods (Posters 51-64); Motor Control (Posters 65-79); Ergonomics (Posters 80-90); Lower Extremity (Posters 91-102); Falls (Posters 103-113); Posture & Balance (Posters 114-133); Clinical (Posters 134-156); Rehabilitation (Posters 157-168); and Wheelchair Biomechanics (Posters 169-172)

POSTER SESSION 2:

FRIDAY, FROM 8:00 - 11:00 AM

(Posters must be mounted by 7:45 am and removed by 11:15 am.)

Azalea meeting room: Thematic posters from Amputee Gait and Computational biomechanics

Hickory meeting room: Upper Extremity (Posters 203-220)

Dogwood meeting room: Comparative (Posters 173-175); Knee (Posters 176-192); and Spine (Posters 193-202)

Ballroom A: Running (Posters 221-241); Sports (Posters 242-270); Instrumentation (Posters 271-276); Gait (Posters 277-313); Prosthetics and Orthotics (Posters 314-332); Thematic Posters from Seating, Muscle Imaging and Powered Exoskeleton.

PODIUM PRESENTATIONS

Presenters are allotted 10 minutes for the presentation and 5 minutes for discussion. **Speakers will not be allowed to use their own computers for podium presentations. Speakers must upload their presentation to the conference computer in their presentation room during the break prior to their presentation session.** Due to space constraints, we will also stream all talks in Ballroom B to the Cypress meeting room and talks in Ballroom C to the Live Oak meeting room.

THEMATIC POSTER PRESENTATIONS

Posters must be mounted by 8:00 am and removed by: 6:45 pm (Thurs.), 5:30 pm (Fri.) and 4:00 pm (Sat.). Thematic Poster sessions have been added for 2012. The first 15 minutes of each session are dedicated to viewing the posters for the session. Each poster will have a 5 minute formal presentation and a 10 minute discussion period. Thematic poster sessions are audience-centric, with the majority of the session being devoted to stimulate scientific discussion on the theme topic. (Podium presentations are presenter-centric, the majority of time devoted to presentation with only a few minutes for questions from the audience.) The discussion in a thematic poster session differs from a slide presentation in that it involves the entire audience. In fact, the ideal discussion is one in which the members of the audience engage in discussion with each other. Successful discussions should focus on the topic and not on the individual presentation or presenter. Participants should leave having both learned about the work presented, but also about how the work will be integrated into the field and what some next steps might be.

BREAKFAST & LUNCHES

Breakfast: Hot and cold breakfast options and fruit will be served daily beginning at 7:00 am. **Lunches:** A choice of prepared lunches and salads will be provided daily, including a vegetarian option.

BANQUET

7:00 – 10:00 pm, J. Wayne Reitz Union Grand Ballroom. The first bus will leave the Hilton at 6:15 pm. The last bus will leave the Reitz Union at 10 pm.

SPEAKER PRACTICE ROOM

Birch meeting room

INTERNET ACCESS

Free wireless internet access is available throughout the conference hotel. You are **strongly** encouraged to check and download updated meeting proceedings and abstracts from the ASB 2012 website prior to the presentation sessions. No electronic versions of the proceedings or abstracts (e.g. USB thumb drives or CDs) will be provided at the meeting.

SOCIAL PROGRAM

OPENING COCKTAIL RECEPTION

WEDNESDAY, AUGUST 15
5:45 - 7:45 PM
FLORIDA MUSEUM
OF NATURAL HISTORY

The opening cocktail reception will be held in the Florida Museum of Natural History (<http://www.flmnh.ufl.edu/>), which is located on the campus of UF and is a short walk (7 minutes) from the conference venue at the UF-Hilton. The museum features the Butterfly Rainforest, a screened vivarium which houses subtropical and tropical plants and trees to support 55 to 65 different species and hundreds of free-flying butterflies. Guests can stroll through the Butterfly Rainforest on a winding path and relax to the sounds of cascading waterfalls.

BANQUET

THURSDAY, AUGUST 16
7:00 - 10:00 PM
REITZ GRAND BALLROOM

The banquet will be held in the Grand Ballroom of the J. Wayne Reitz Union on the UF campus. Buses will be available for transportation between the UF – Hilton and the Reitz Union. At the beginning of the banquet, the 2012 class of Fellows of the American Society of Biomechanics will be inducted. Be sure to take advantage of your discount coupons for souvenirs at the Reitz Union Bookstore prior to entering the Annual Banquet!

STUDENT NIGHT ON THE TOWN

FRIDAY, AUGUST 17
6:30 PM
GATOR'S DOCKSIDE

An informal opportunity for students to mix and mingle with other ASB student members. Please plan to join us at Gator's Dockside (just west of the UF campus: 3842 Newberry Road, Suite 1-A; (352) 338-4445) to meet fellow ASB students and casually network with one another. Students will be on their own for dinner and drinks this evening. You don't want to miss the chance to kick back and relax with your fellow students!

APTA SOCIAL

FRIDAY, AUGUST 17
6:30 - 7:30 PM
FLORIDA ROOM

The 2nd annual Networking Social of the American Physical Therapy Association (APTA) at the ASB annual meeting is an outreach for the Physical Therapy profession at the conference that provides a casual environment for professionals to talk about the integration of physical therapy in the biomechanics research setting, providing exposure for the profession and promotes collaborative research. Rehabilitation therapists, collaborators and students welcome! Light fare and beverages will be provided. The event is sponsored by The MotionMonitor®. Contact Margaret Finley, PT, Ph.D. (finley@m@uindy.edu) if you have questions.

5K RUN THROUGH THE SWAMP

SATURDAY, AUGUST 18
7:00 - 8:00 AM
UF HILTON LOBBY

Meet in the Hilton lobby to join us in a 5K Fun Run around the UF campus.

NETWORKING & PROFESSIONAL DEVELOPMENT

STUDENT EVENT WEDNESDAY, AUGUST 15 4:30 - 5:30 PM BALLROOM A

The event will include tips and pointers on how you can excel as a student as you work toward your career. Irene Davis, Ph.D., Thomas Clanton, Ph.D., and Angela DiDomenico, Ph.D. will be leading discussions about how to effectively network while at the meeting, give pointers for writing a fellowship application that will stand out to reviewers, and share the ins and outs of working in the industry.

This will be an informative session for students, so you don't want to miss it! Open to student members of ASB.

DIVERSITY LUNCHEON THURSDAY, AUGUST 16 12:45 - 1:45 PM FLORIDA ROOM

The diversity luncheon will feature a discussion led by members of the ASB Diversity Task Force. During the discussion, we hope to identify ways in which ASB can better reach those of diverse backgrounds and further extend its reach to the academic community.

The luncheon is open to all

meeting attendees. Due to room size constraints, reservations will be taken. Remaining seats will be open on a first-come, first-served basis. Please make plans to join us for this very important conversation!

Contact ASB Student Representative Meghan Vidt (mvidt@wakehealth.edu) to RSVP for this event if not done when registering for the conference.

WOMEN IN SCIENCE BREAKFAST FRIDAY, AUGUST 17 7:00 - 8:00 AM FLORIDA ROOM

The Women in Science Breakfast is a roundtable discussion between students and members of ASB. The informal atmosphere allows students and professionals to network and discuss the unique aspects of women pursuing a career in a scientific field.

This has been a very popular event in the past, so reservations will be required. Contact ASB Student Representative Meghan Vidt (mvidt@wakehealth.edu) to RSVP for this event if not done when registering for the conference.

TUTORIALS WEDNESDAY, AUGUST 15

12:30 - 2:30 PM CENTURY A Filtering of Biomechanical Data John H. Challis, Ph.D.; *Pennsylvania State University*

This tutorial will review: frequency analysis, data acquisition, noise properties, recursive and non-recursive filters, filter types, splines, truncated Fourier series, data differentiation, selecting the degree of filtering, and conclude with some biomechanics-specific examples.

2:40 - 3:10 PM CENTURY A Overview of the Annual Grand Challenge Competition to Predict In Vivo Knee Loads B.J. Fregly, Ph.D.; *University of Florida*

This tutorial will provide an overview of an annual "Grand Challenge Competition to Predict In Vivo Knee Loads" being held each year at the ASME Summer Bioengineering Conference.

The goal of the competition is to encourage critical evaluation of musculoskeletal model estimates of contact and muscle forces during movement. Competing research teams predict in vivo medial and lateral knee contact forces in a

blinded fashion using gait data collected from subjects implanted with a force-measuring knee replacement.

The tutorial will cover the goals of the competition, the accuracy of the blinded contact force predictions generated thus far, and plans for upcoming data distributions from these unique subjects.

3:20 - 4:20 PM CENTURY A Measuring 3D Skeletal Kinematics Using Radiographic Images Scott A. Banks, PhD; *University of Florida* Shang Mu, PhD; *MAKO Surgical Corp*

The purpose of this tutorial will be to introduce participants to the basic principles of skeletal kinematic measurement from radiographic images, and to show examples of how these techniques can be applied in a variety of different research contexts.

Examples of single- and stereo-projection imaging will be covered, as well as methods for performing measurements with natural bones, bones with implanted metallic markers, and with joint replacement implants.

LAB TOURS

WEDNESDAY, AUGUST 15

LAB TOUR 1: 10:30 AM - 12:30 PM

LAB TOUR 2: 2:00 - 4:00 PM

APPLIED NEUROMECHANICS LABORATORY

The Applied Neuromechanics Laboratory focuses on interactions between musculoskeletal biomechanics and sensorimotor control of lower extremity function with particular emphasis on the coordination of locomotion and balance. This lab applies biomechanical and neurophysiologic principles to understand aging and disease processes (Autism Spectrum Disorders, Progressive Supranuclear Palsy, Parkinson's disease, Essential tremor) to optimize behavioral and surgical interventions.

BIOMECHANICS LABORATORY

The Center for Exercise Science Biomechanics Lab, founded in 1995, focuses on analyzing human movement, specializing on the lower extremities. The lab studies the motion of the hip, knee and ankle during activities of daily living and fast-paced movements for different populations. Ongoing projects include investigation of the health benefits of a lever-drive wheelchair and effects of whole-body vibration on balance control.

NEUROMUSCULAR PHYSIOLOGY LABORATORY

The Neuromuscular Physiology Lab has the broad research interest of the lab in neuromuscular mechanisms that mediate acute perturbations (arousal, fatigue, and sleep) and chronic influences (aging, disease, training, and learning) to motor performance in humans. Currently, research in the lab involves identifying neural activation strategies from the single motor unit to the whole muscle level. The clinical significance of this work relates to populations that have increased tremor and impaired accuracy, such as in older adults and Parkinsonian patients.

BIOMECHANICS & MOTION ANALYSIS LABORATORY

The Biomechanics & Motion Analysis Lab in the Orthopaedics and Sports Medicine Institute contains one of the largest 3D motion analysis laboratories in the southeast. The lab is focused on clinical research across the spectrum of musculoskeletal disease including low back pain and osteoarthritis. The lab also has a strong history of research in sports medicine with a number of ongoing studies addressing sports performance and injury prevention.

HUMAN PERFORMANCE MOTION LABORATORY

The Human Performance Motion Lab (HPML) represents a collaboration between the Brain Rehabilitation Research Center at the VA Medical Center, and the Department of Physical Therapy, University of Florida. Projects ongoing at the HPML use neurophysiological and biomechanical approaches to understand the neural control of movement, mechanisms of disordered motor control in neuropathological conditions, and the capacity for motor recovery in adults following central nervous system injury.

LABORATORY FOR REHABILITATION NEUROSCIENCE

The Laboratory for Rehabilitation Neuroscience (LRN) is focused on developing an understanding of how the human brain is impaired in movement disorders and stroke, and developing interventions that mitigate the corresponding behavioral deficits. There are more than 3,000 square feet of space for laboratory data collection and analysis. Data collection devices include: Vicon motion analysis, 256 channel Biosemi EEG, Delsys EMG, Medoc pain stimulation system, and manipulanda for measuring force and movement from upper and lower limb joints. There is a fiber optic sensor laboratory where MRI-compatible sensors are manufactured. There is dedicated computer space for a full complement of neuroimaging techniques including voxel based morphometry, functional MRI, resting state fMRI, iron imaging and diffusion imaging.

PLENARY SESSIONS

THURSDAY, AUGUST 16

KEYNOTE ADDRESS

2:00 - 3:00 PM

PHILLIPS CENTER FOR THE PERFORMING ARTS

Functional recovery in individuals with chronic incomplete spinal cord injury with intensive activity-based rehabilitation

Susan J. Harkema, Ph.D.

Professor and Owsley B. Frazier Rehabilitation Chair, Department of Neurological Surgery, University of Louisville

ABOUT THE SPEAKER

Dr. Susan J. Harkema, Ph.D., is the Rehabilitation Research Director of the Kentucky Spinal Cord Injury Research Center at the University of Louisville. She is the Director of Research at Frazier Rehab Institute and is Director of the NeuroRecovery Network that provides standardized activity-based therapies for individuals with spinal cord injury at seven national rehabilitation centers in the United States. Her research focuses on neural plasticity of spinal networks and recovery of function after spinal cord injury.

In 2007, the National Spinal Cord Injury Association nominated her into the SCI Hall of Fame for Achievement in Research in Quality of Life, and most recently, Dr. Harkema was a co-recipient of the Reeve-Irvine Research Medal in 2009, awarded to individuals who have made critical contributions to promoting repair of the damaged spinal cord and recovery of function. In 2011, she received the Rick Hansen Foundation Difference Maker Award and Popular Mechanics Breakthrough Award.

FRIDAY, AUGUST 17

KEYNOTE ADDRESS

11:15 AM - 12:15 PM

PHILLIPS CENTER FOR THE PERFORMING ARTS

Memorial Tribute to Prof. David Winter, Ph.D., P.Eng

(June 16, 1930 – February 6, 2012)

Organizers:

Philip E. Martin, Ph.D., Iowa State University, and Erika Nelson-Wong, Ph.D., Regis University

ABOUT DR. WINTER

Dr. Winter had a long and impactful academic career in biomechanics, primarily at the University of Waterloo from 1974 through 2012, as an engineer, scientist, author, teacher and mentor. Trained in electrical engineering, physiology, and biophysics, Dr. Winter made many lasting contributions to our field. He authored four highly significant textbooks on the measurement, assessment, and interpretation of normal and pathological gait, posture, and balance; contributed numerous scientific publications to our research literature; trained a new generation of biomechanics scholars and educators; and was an internationally recognized leader in the development of biomechanics as a field of study.

Among his many distinctions, awards, and honors, he received the Career Investigators Award from the Canadian Society for Biomechanics, the Lifetime Achievement Award from the Gait and Clinical Movement Analysis Society, and the Muybridge Medal from the International Society of Biomechanics.

The purpose of this tribute session is to celebrate Dr. Winter's tremendous accomplishments in biomechanics and highlight the large impact that his work has had on most, if not all, of us. Presenters will provide four perspectives of his accomplishments and impact. Audience members will also have an opportunity to share additional memories of the effects Dr. Winter had on their careers and our field.

Presenters:

Philip Martin, Ph.D., Iowa State University. Walter Herzog, Ph.D., University of Calgary. John Yack, Ph.D., University of Iowa. Erika Nelson-Wong, Ph.D., Regis University.

PLENARY & AWARD SESSIONS

FRIDAY, AUGUST 17

BORELLI AWARD LECTURE

5:30 - 6:30 PM | PHILLIPS CENTER FOR PERFORMING ARTS

Neural Control of Force: A Biomechanics Perspective

Carlo De Luca, Ph.D.

NeuroMuscular Research Center, Boston University

ABOUT THE SPEAKER

Carlo J. De Luca is a Biomedical Engineer who received his doctorate degree in 1972 from Queen's University in Canada, where he began his academic career. He was appointed to the faculties of MIT and Harvard Medical School simultaneously from 1974 to 1984. He then joined Boston University, where he currently holds the titles of: Professor of Biomedical Engineering, founding Director of the NeuroMuscular Research Center, Research Professor of Neurology, and Professor of Electrical and Computer Engineering. He served as Dean ad interim of the College of Engineering from 1986 to 1989.

Dr. De Luca has taught students in engineering and medical schools. He has trained 41 M.S. and Ph.D. students, in addition to 40 scientists from 14 countries. He is recognized for introducing engineering principles and concepts to the field of Electromyography; for introducing EMG signal decomposition technologies; for studies on the control of motor neurons during voluntary contractions; for assessment of muscle fatigue via the surface EMG signal; and for co-introducing the concept of open-loop /closed-loop control for posture.

His body of work includes: a book, *Muscles Alive*, 111 peer-reviewed articles, 20 book chapters, 17 peer-reviewed conference papers, and 15 patents. His writings have been cited over 12,000 times. He founded Delsys Inc., and continues to serve as its President and CEO. He is the founder and president of the Neuromuscular Research Foundation, established to recognize researchers in the field of Electromyography, and in the field of Biomechanics with emphasis on Motor Control.

He is a Founding Fellow of two Bioengineering societies (AIMBES and BMES), and a Life Fellow of the IEEE BMES. He served a term on the National Advisory Council for Biomedical Imaging and Bioengineering of NIH. Throughout his career he has received awards from scientific and philanthropic societies.

SATURDAY, AUGUST 18

YOUNG SCIENTIST PRE-DOC AWARD

11:30 - 11:45 AM | PHILLIPS CENTER FOR PERFORMING ARTS

JACOB ELKINS, University of Iowa:

Expedited Computational Analysis of Fracture of Ceramic THA Liners: Obesity and Stripe Wear Considerations

YOUNG SCIENTIST POST-DOC AWARD

11:45 AM - 12:00 PM | PHILLIPS CENTER FOR PERFORMING ARTS

METIN YAVUZ, PH.D. Ohio College of Podiatric Medicine:

Plantar Shear Stress and its Clinical Implications

JAMES J. HAY MEMORIAL AWARD LECTURE

12:00 - 12:45 PM | PHILLIPS CENTER FOR PERFORMING ARTS

Approaches to Research in Sports Biomechanics

Jesus Dapena, Ph.D.

Professor, Director of the Biomechanics Laboratory, Indiana University

ABOUT THE SPEAKER

Dr. Jesus Dapena received a Licenciado degree in biological sciences from the Universidad Complutense, Madrid in 1973, and a Ph.D. in biomechanics from the University of Iowa in 1979. From 1979 to 1982 he held an assistant professor position in the Department of Exercise Science at the University of Massachusetts, and since 1982 he has held associate and full professor positions in the Department of Kinesiology at Indiana University. He specializes in sports biomechanics. His research has focused on a variety of activities, including high jumping, discus throwing, hammer throwing, hurdling, flail-like motions, tennis serving and field hockey, among others.

In addition, Dr. Dapena has worked on the development of various tools for the analysis of human motion, including the calculation of angular momentum, computer simulation, and 3D movie/video analysis techniques. Between 1982 and 2007, Dr. Dapena was the scientist in charge of the biomechanical analysis of the high jump event for USA Track & Field, where he analyzed the techniques of the top American high jumpers and gave them advice for technique changes.

SYMPOSIA & RESEARCH STUDIES

THURSDAY, AUGUST 16

ASB FELLOWS SYMPOSIA

9:45 - 11:00 AM | BALLROOM A

Organized by: Jill McNitt-Gray, University of Southern California

The inaugural 2012 ASB Fellows symposia will feature the research and perspectives of ASB Fellows pursuing diverse lines of research. Each presentation will focus on a particular area of interest, with reference to classic papers that influenced their approach, helped frame their working hypothesis, or provided perspective implications of their results. The last session will conclude with a panel discussion focusing on future directions and opportunities for cross-disciplinary collaborations.

Featured Speakers: Ted Gross, University of Washington; Melissa Gross, University of Michigan; Kenton Kaufman, Mayo Clinic; Peter Cavanagh, University of Washington.

FRIDAY, AUGUST 17

AGING AND GAIT SYMPOSIUM

1:30 - 3:15 PM | BALLROOM A

Organized by: Jason Franz and Roger Kram, University of Colorado Boulder

Sponsored by: UF Institute on Aging

Advanced age brings energetic and biomechanical changes that can negatively affect walking ability, independence and quality of life. Active research in this area continues to probe the pervasive consequences of aging on gait, including greater antagonist leg muscle coactivation, greater metabolic cost of movement, and the redistribution of leg muscle function. This symposium brings together leading researchers to share their latest scientific findings and identify future directions in aging research.

Featured Speakers: Justus Ortega, Humboldt State University; Kevin Conley, University of Washington; Paul DeVita, East Carolina University; Jason Franz,

University of Colorado; Dennis Anderson, Beth Israel Deaconess Medical Center; Christopher Hurt, University of Illinois at Chicago.

FRIDAY, AUGUST 17

TEACHING BIOMECHANICS

3:45 - 5:15 AM | BALLROOM A

Organized by: Cecile Smeesters, Universite de Sherbrooke

This year's Teaching Biomechanics Symposium will examine the benefits and challenges of shifting from passive (lecture, reading, audio-visual, demonstration) to active (group discussion, practice, teaching others) teaching methods. Topics will include: lecture slide completeness, course design to promote learning, problem- and project-based learning, as well as teamwork for both students and teachers. Finally, to put into practice the just-in-time teaching skills learned in last year's symposium, attendees are invited to participate in a short questionnaire prior to this year's symposium: <http://www.surveymonkey.com/s/D85BDHH>.

Featured Speakers: Patrik Doucet, Université de Sherbrooke; Hyun Gu Kang, California State Polytechnic University; Erika Nelson-Wong, Regis University; Cécile Smeesters, Université de Sherbrooke.

SATURDAY, AUGUST 18

SEATING

8:00 - 9:30 AM | AZALEA

Organized by: Tammy Bush, Michigan State University

We are excited to include a symposium on seating mechanics this year at ASB. This session will include topics associated with the biomechanics of automotive and medical seating, as well as issues related to seating for cyclists. Research will highlight upper extremity loading in wheelchairs, tissue deformation of the

buttocks, seating vibration, and changes in blood flow due to loading. These presentations will occur in the form of the newly added Thematic Poster Session where speakers will provide a brief podium presentation of their work and then time will be allowed for longer discussions with each speaker.

Featured Speakers: Abinand Manorama, Michigan State University; Timothy Craig, University of Kansas; Sharon Sonenblum, Georgia Institute of Technology; Philip Requejo, Rancho Los Amigos National Rehabilitation Center; Sujeeth Parthiban, University of Illinois at Chicago.

RESEARCH STUDIES

WEDNESDAY - SATURDAY

CEDAR MEETING ROOM:

Want to test proprioception? There's an app for that. (PI: Andrew Karduna, PhD, University of Oregon)

Help us evaluate the feasibility of using smart phone technology to assess proprioception. We only need 5 minutes of your time and one lucky participant will walk away from the conference with a iPod Touch.

MAGNOLIA MEETING ROOM:

Portable Concussion Assessment

Using the iPad2 (PI: Jay L. Alberts, PhD, Cleveland Clinic)

Want to see how your cognitive and motor function, balance, and reaction time stack up? In about 15 minutes, we can test all this and more with a series of modules currently being piloted for use in assessing concussion at injury and during recovery – all on the Apple iPad. Stop by our booth for more information!

ORAL PRESENTATIONS | THURSDAY, AUGUST 16, 8:00 - 9:15 AM

| | CENTURY A BALANCE DURING LOCOMOTION <i>Session Chairs: John Dingwell, Rick Neptune</i> | CENTURY B OVERFLOW CYPRESS TISSUE MECHANICS <i>Session Chairs: Kyle Allen, Thomas Angelini</i> | CENTURY C OVERFLOW LIVE OAK BONE <i>Session Chairs: Brent Edwards, Timothy Burkhart</i> | AZALEA THEMATIC POSTERS STROKE <i>Session Chairs: Margaret Finley, Carolyn Patten</i> |
|---------|---|--|---|---|
| 8:00 AM | Reduced Light Intensity Alters Spatiotemporal Gait Patterns During Treadmill Walking Huang C, Chien J, Mukherjee M, Siu K <i>Nebraska Biomechanics Core Facility; University of Nebraska Medical Center</i> | A Computational Model to Estimate Pre-Stress Between Brain Tissue and a Needle Used for Convection Enhanced Delivery Casanova F, Carney P, Samtinoranont M <i>University of Florida</i> | Repeatability of Image Registration and Segmentation Procedures for CT Scans of the Human Distal Radius Bhatia V, Edwards W, Troy K <i>University of Illinois at Chicago</i> | Poster Viewing |
| 8:15 AM | Active Control of Lateral Balance Varies Throughout a Step During Treadmill Walking Sawers A, Hahn M <i>University of Washington</i> | Correlations Between Temporomandibular Disc Damage and Bulk Shear Mechanics Juran C, McFetridge P <i>University of Florida</i> | Predicting Distal Radius Bone Strains and Injury in Response to Impacts to Failure Using Multi-Axial Accelerometers. Burkhart T, Dunning C, Andrews D <i>Western University</i> | Scapulohumeral Kinematics in Individuals with Upper Extremity Impairment from Stroke Finley M, Combs S <i>Krannert School of Physical Therapy University of Indianapolis</i> |
| 8:30 AM | Whole-Body Angular Momentum During Stair Ascent and Descent Silverman A, Neptune R, Sinitski E, Wilken J <i>Colorado School of Mines</i> | A Novel High-Order Element for the Analysis of Heart Valve Leaflet Tissue Mechanics Mohammadi H, Herzog W <i>University of Calgary</i> | Tracking High-Speed Patella Motion Using Biplanar Videoradiography: An Accuracy Study Rainbow M, Cheung R, Miranda D, Schwartz J, Crisco J, Davis I, Fleming B <i>Harvard Medical School</i> | Gait Training with Visual and Proprioceptive Feedback Improves Overground Propulsive Forces in People Post-Stroke Wutzke C, Michael L <i>University of North Carolina at Chapel Hill</i> |
| 8:45 AM | Balance Recovery Kinematics After a Lateral Perturbation in Patients with Transfemoral Amputations Werner K, Linberg A, Wolf E <i>Department of Orthopedics and Rehabilitation, Walter Reed National Military Medical Center</i> | Age-Related Changes in Dynamic Compressive Properties of Soft Tissues Over the Hip Region Measured by Forced Vibration Choi W, Robinovitch S <i>Simon Fraser University</i> | Storage and Loss Moduli of Bone in Osteogenesis Imperfecta Albert C, Jameson J, Toth J, Smith P, Harris G <i>Marquette University</i> | Comparison of Module Quality and Walking Performance of Hemiparetic Subjects Pre and Post Locomotor Rehabilitation Therapy Routson R, Clark D, Bowden M, Kautz S, Neptune R <i>Department of Mechanical Engineering, The University of Texas at Austin</i> |
| 9:00 AM | Dynamic Stability of Individuals with and Without Unilateral Trans-Tibial Amputations Walking in Destabilizing Environments Faust K, Terry K, Dingwell J, Wilken J <i>Brooke Army Medical Center</i> | Influence of Scaling Assumptions on Tendon Stiffness Estimation Walker E, Sandercock T, Perreault E <i>Northwestern University</i> | Metaphyseal and Diaphyseal Bone Loss Following Transient Muscle Paralysis Are Distinct Osteoclastogenic Events Ausk B, Gross T <i>University of Washington</i> | Distinct Patterns of Recovery Following Therapeutic Intervention Post-Stroke: Responders vs. Non-Responders Patil S, Patten C <i>University of Florida</i> |

ORAL PRESENTATIONS | THURSDAY, AUGUST 16, 9:45 - 11:00 AM

| | CENTURY A ASB FELLOWS SYMPOSIUM <i>Session Chair: John Challis</i> | CENTURY B OVERFLOW CYPRESS ERGONOMICS <i>Session Chairs: Angela DiDomenico, Bradley Davidson</i> | CENTURY C OVERFLOW LIVE OAK IMAGING-KNEE <i>Session Chairs: Zachary Domire, Ryan Breighner</i> | AZALEA THEMATIC POSTERS OBESITY <i>Session Chairs: Paul DeVita; Ray Browning</i> |
|----------|---|--|--|---|
| 9:45 AM | Can Muscle Atrophy Enable Bone Hypertrophy? Gross T <i>University of Washington</i> | Use of Marker-Less Motion Capture Approach for Construction Field Workers' Biomechanical Analysis Li C, Lee S, Armstrong T <i>University of Michigan</i> | Measuring 3D Tibiofemoral Kinematics and Contact Using Dynamic Volumetric Magnetic Resonance Imaging Kaiser J, Bradford R, Johnson K, Wieben O, Thelen D <i>University of Wisconsin</i> | Poster Viewing |
| 10:00 AM | Why Feelings Matter: Emotions and Biomechanics in Health and Illness Gross M <i>University of Michigan</i> | What Causes Slips, Trips, and Falls on the Fireground? A Survey Petrucci M, Harton B, Rosengren K, Horn G, Hsiao-Weckler E <i>University of Illinois at Urbana-Champaign</i> | 3D-To-2D Registration for the EOS Biplanar Radiographic Imaging System Kern A, Kang L, Baer T, Segal N, Anderson D <i>University of Iowa</i> | The Issue of Tissue: A Comparison of Kinematic Models in Obese Adults Board W, Haight D, Browning R <i>Colorado State University</i> |
| 10:15 AM | Use of Assistive Technology to Improve Mobility Kaufman K <i>Mayo Clinic</i> | Determining Stabilization Time Using a Negative Exponential Mathematical Model DiDomenico A, McGorry R, Banks J <i>Liberty Mutual</i> | Lateral Heel Wedge Affects the Tibiofemoral Kinematics in Knee OA Patients: A Preliminary Weight Bearing MRI Study Wei F, Allen J, Gade V, Stolfi C, Cole J, Barrance P <i>Kessler Foundation Research Center</i> | Changes in Gait Over a 30 Minute Walking Session in Obese Individuals Do Biomechanical Loads Increase in Pursuit of Weight Loss? Singh B, Janz K, Yack H <i>University of Iowa</i> |
| 10:30 AM | Remote Monitoring of Human Movement Cavanagh P <i>University of Washington</i> | A Biomechanical Comparison of Three Backpack Frames During Treadmill Walking. Higginson B, Mills K, Pribanic K, Hollins J, Heil D <i>Gonzaga University</i> | Effect of ACL Reconstruction on Tibiofemoral Cartilage Contact During Downhill Running. Thorhauer E, Anderst B, Tashman S <i>University of Pittsburgh</i> | Impact of Obesity on the Function of Hip Knee and Ankle During Transition Between Level and Stair Walking Umezaki K, Ramsey D <i>University at Buffalo</i> |
| 10:45 AM | Panel Discussion | Vertical Trajectory of Center of Mass is Maintained with Increased Vertical Stiffness while Carrying Load Caron R, Wagenaar R, Lewis C, Saltzman E, Holt K <i>Boston University, College of Health and Rehabilitation Sciences: Sargent</i> | The Influence of Concentric vs. Eccentric Muscle Control on 3D and Dynamic Patellofemoral Contact Kinematics Borotikar B, Siddiqui A, Sheehan F <i>National Institutes of Health, Bethesda, MD, USA</i> | Obesity Modifies Canine Gait Brady R, Sidiropoulos A, Bennett H, Rider P, Domire Z, DeVita P <i>East Carolina University</i> |

ORAL PRESENTATIONS | THURSDAY, AUGUST 16, 11:30 AM - 12:45 PM

| | CENTURY A GAIT 1: METHODS <i>Session Chairs: Jinger Gottschal, Greg Sawiki</i> | CENTURY B OVERFLOW CYPRESS POSTURAL CONTROL <i>Session Chairs: Hyun Gu Kang, Kimberly Bigelow</i> | CENTURY C OVERFLOW LIVE OAK ORTHOPEDICS <i>Session Chairs: Robert Siston, Steve Piazza</i> | AZALEA THEMATIC POSTERS JOURNAL AWARDS <i>Session Chair: Don Anderson</i> |
|-------------|---|---|---|--|
| 11:30 AM | Simple Predictive Models Reveal Step-To-Step Control of Walking Dingwell J, Bohnsack N, Cusumano J <i>University of Texas at Austin</i> | Movement Strategy and Arm Use Redistribute Sit-To-Stand Joint Moments Gillette J, Stevermer C, Hall M <i>Iowa State University</i> | Scratch-Based Damage Quantification and Wear Prediction in Total Hip Arthroplasty Kruger K, Tikekar N, Heiner A, Baer T, Lannutti J, Brown T <i>University of Iowa</i> | Poster Viewing |
| 11:45 AM | Are External Knee Load and EMG Measures Strong Indicators of Internal Knee Contact Forces During Gait? Meyer A, D'Lima D, Banks S, Lloyd D, Besier T, Colwell C, Fregly B <i>University of Florida</i> | Coherence Analysis Reveals Altered Postural Control During Standing in Persons with Multiple Sclerosis Huisinga J, Mancini M, Veys C, Horak F <i>University of Kansas Medical Center</i> | A PLLA Fabric System for Prevention of Hip Dislocation Andersen L, M. Genin G, Brondsted P <i>DTU wind energy</i> | Do Skeletal Muscle Properties Recover Following Repeat Botulinum Toxin Type-A Injections? Fortuna R, Horisberger M, Vaz M, Herzog W <i>University of Calgary</i> |
| 12:00 PM | A Novel Methodology Using Principal Component Analysis to Quantify Global Bilateral Asymmetry of Human Gait Hoerzer S, Maurer C, Federolf P. <i>Human Performance Laboratory - University of Calgary</i> | Postural Sway Correlates of Perceived Comfort in Pointing Tasks Solnik S, Coelho C, Pazin N, Latash M, Rosenbaum D, Zatsiorsky V <i>Pennsylvania State University</i> | Comparison of Unicompartmental Knee Arthroplasty and Healthy Limb for Knee Moments Generated During Stair Ascent Fu Y, Kinesy T, Mahoney O, Brown C, Simpson K <i>University of Georgia</i> | Plantar Shear Stress Distributions in Diabetic Patients with and Without Neuropathy Yavuz M, Franklin A, McGaha R, Prakash V, Rispoli J, Stuto J, Torrence G, Lowell D, Canales M <i>Ohio College of Podiatric Medicine</i> |
| 12:15 PM | Discriminating Between Knee Osteoarthritis Severity Levels in Walking Using Only Force Platform Data Miller R, Brandon S, Deluzio K <i>Queen's University</i> | A New Approach to Understand Postural Instability in Young Children with Autism Spectrum Disorders Lee H, Amano S, Fournier K, Radonovich K, Hass C <i>University of Florida</i> | Dynamic Cadaveric Robotic Gait Simulation of Pes Planus Whittaker E, Roush G, Ledoux W <i>VA Puget Sound</i> | Compressive Loading of the Distal Radius Improves Bone Structure in Young Women Troy K, Bhatia V, Edwards W <i>University of Illinois at Chicago</i> |
| 12:30 PM | Determining the Inertial Properties of Running-Specific Prostheses Baum B, Schultz M, Tian A, Hobara H, Kwon H, Shim J <i>University of Maryland, College Park</i> | Flexible Framework for Testing Postural Control Models: Evidence for Intermittent Control? Kang H, Murdock G <i>California State Polytechnic University, Pomona</i> | Graft Material Properties Affect Supraspinatus Force-Generating Capacity in a Simulated Rotator Cuff Repair Santago A, Weinschenk R, Mannava S, Saul K <i>Virginia Tech - Wake Forest School for Biomedical Engineering and Sciences</i> | Simulation Predictions of Prosthetic Foot and Muscle Function in Response to Altered Foot Stiffness During Below-Knee Amputee Gait Fey N, Klute G, Neptune R <i>The University of Texas at Austin</i> |

ORAL PRESENTATIONS | FRIDAY, AUGUST 17, 1:30 - 3:15 PM

| | CENTURY A AGING AND GAIT SYMPOSIUM <i>Session Chair: Jason Franz, Roger Kram</i> | CENTURY B OVERFLOW CYPRESS MOTOR CONTROL <i>Session Chairs: Evangelos Christou, Mike Pavol</i> | CENTURY C OVERFLOW LIVE OAK MUSCLE 1: MODELING & BEHAVIOR <i>Session Chairs: Brian Umberger, Jonas Rubenson</i> | AZALEA THEMATIC POSTERS AMPUTEE GAIT <i>Session Chairs: Jae Kun Shim, Erik Wolf</i> |
|---------|---|---|--|--|
| 1:30 PM | The Determinants of Walking Energetics in Elderly Adults Ortega J <i>Humboldt State University</i> | Motor Learning is Enhanced in Older Adults Following Training with a Less Difficult Task Onushko T, Kim C, Christou E <i>University of Florida</i> | How Do Lower Limb Muscles Scale Across Individuals? Handsfield G, Sauer L, Hart J, Abel M, Meyer C, Blemker S <i>University of Virginia Dept. of Biomedical Engineering</i> | Poster Viewing |
| 1:45 PM | Exercise Efficiency and Mitochondrial Coupling in the Elderly Conley K, Jubrias S <i>Univ. of Washington</i> | Quantifying Increased Skill Using Measured Bicycle Kinematics As Riders Learn to Ride Bicycles Cain S, Ulrich D, Perkins N <i>University of Michigan</i> | A General Approach to Muscle Wrapping Over Multiple Surfaces Stavness I, Sherman M, Delp S <i>Stanford University</i> | Decreased Gait Transition Speeds in Unilateral, Transtibial Amputee Gait Norman T, Chang Y <i>Georgia Institute of Technology</i> |
| 2:00 PM | Modulating Stride Length & Walking Velocity by Young & Old Adults DeVita P, Rider P, Sidiropoulos A, Cople T, Domire Z, Hortobagyi T <i>East Carolina University</i> | Modeling Intra-Trial Variability of a Redundant Planar Reaching Task Nguyen H, Cusumano J, Dingwell J <i>University of Texas Austin, Dept. of Mechanical Engineering</i> | Parameterizing and Validating a Three Compartment Muscle Fatigue Model for Isometric Tasks Looft J, Frey Law L <i>The University of Iowa</i> | Both Limbs in Unilateral Transtibial Amputees Display Increased Risk for Tripping Wurdeman S, Yentes J, Myers S, Jacobsen A, Stergiou N <i>Nebraska Biomechanics Core Facility</i> |
| 2:15 PM | How Does Age Affect Individual Leg Mechanics During Uphill and Downhill Walking? How Does Age Affect Individual Leg Mechanics During Uphill and Downhill Walking? Franz J, Kehler A, MacDonald L, Kram R <i>University of Colorado Boulder</i> | Biomechanics Constrains Variability in Spatial Structure of Muscle Coordination for Endpoint Force Generation Sohn M, McKay J, Ting L <i>Georgia Institute of Technology</i> | Near-Infrared Light Therapy Delays the Onset of Skeletal Muscle Fatigue Larkin K, Christou E, Baweja H, Moore M, Tillman M, George S, Borsa P <i>University of Florida</i> | Comparison of Kinematic, Kinetic, and Mechanical Work Data Between Traditional and Bone Bridge Amputation Techniques During Fast Walking One Year Post Ambulation Without an Assistive Device Kingsbury T, Thesing N, Collins J, Carney J, Wyatt M <i>Naval Medical Center, San Diego, CA</i> |
| 2:30 PM | Reduced Hip Extension Range of Motion and Plantar Flexion Strength Are Functionally Significant Impairments That Affect Gait in Older Adults Anderson D, Madigan M <i>Beth Israel Deaconess Medical Center Park</i> | Cortical Activations During a Joystick Pursuit Task with Modulated Spindle Afferents Soltys J, Wilson S <i>The University of Missouri Kansas City</i> | Immediate Application of Cyclic Compressive Loading Attenuates Secondary Hypoxic Injury Following Damaging Eccentric Exercise Haas C, Abshire S, Butterfield T, Best T <i>The Ohio State University</i> | Upper Body Kinematics of Bilateral Transtibial Prosthesis Users During Gait Major M, Stine R, Hodgson M, Gard S <i>Northwestern University Prosthetics-Orthotics Center</i> |

ORAL PRESENTATIONS | CONTINUED FROM PAGE 16

| | CENTURY A AGING AND GAIT SYMPOSIUM <i>Session Chair: Jason Franz, Roger Kram</i> | CENTURY B OVERFLOW CYPRESS MOTOR CONTROL <i>Session Chairs: Evangelos Christou, Mike Pavol</i> | CENTURY C OVERFLOW LIVE OAK MUSCLE 1: MODELING & BEHAVIOR <i>Session Chairs: Brian Umberger, Jonas Rubenson</i> | AZALEA THEMATIC POSTERS AMPUTEE GAIT <i>Session Chairs: Jae Kun Shim, Erik Wolf</i> |
|---------|--|---|--|---|
| 2:45 PM | Age-Related Differences in the Maintenance of Frontal Plane Dynamic Stability while Stepping to Targets Hurt C, Grabiner M <i>University of Illinois at Chicago</i> | Effect of Tactile Perturbation on Blindfolded Circular Path Navigation Vallabhajosula S, Mukherjee M, Stergiou N <i>Nebraska Biomechanics Core Facility, University of Nebraska at Omaha</i> | Force Enhancement: An Evolutionary Strategy to Reduce the Metabolic Cost of Muscle Contraction? Joumaa V, Herzog W <i>University of Calgary</i> | Net Efficiency of the Combined Ankle-Foot System in Normal Gait: Insights for Passive and Active Prosthetics Takahashi K, Stanhope S <i>University of Delaware</i> |
| 3:00 PM | Panel Discussion | Vibration Impairs Proprioception During Active Cyclical Ankle Movements Holmes T, Floyd L, Dean J <i>Medical University of South Carolina</i> | Association Between Motor Unit Recruitment and the Rates of Strain, Force Rise and Relaxation Lee S, de Boef-Miara M, Arnold A, Biewener A, Wakeling J <i>Simon Fraser University</i> | Ground Reaction Force and Temporal-Spatial Adaptations to Running Velocity When Wearing Running-Specific Prostheses Baum B, Tian A, Schultz M, Hobara H, Linberg A, Wolf E, Shim J <i>University of Maryland, College Park</i> |

ORAL PRESENTATIONS | FRIDAY, AUGUST 17, 3:45 - 5:15 PM

| | CENTURY A TEACHING SYMPOSIUM <i>Session Chairs: Cecile Smeester, Erika Nelson-Wong</i> | CENTURY B OVERFLOW CYPRESS COMPARATIVE <i>Session Chairs: K. Alex Shorter, Raziel Riemer</i> | CENTURY C OVERFLOW LIVE OAK SPORTS <i>Session Chairs: Glen Fleiseg, Matt Seeley</i> | AZALEA THEMATIC POSTERS COMPUTATIONAL BIOMECHANICS <i>Session Chairs: Karen Troy, Silvia Blemker</i> |
|---------|--|---|---|---|
| 3:45 PM | Influence of Lecture Slide Completeness on Student Learning in a Biomechanics Course Within a Physical Therapy Curriculum Nelson-Wong E, Eigsti H, Hammerich A, Marcisz N <i>Regis University</i> | Mesozoic Speed Demons: Flight Performance of Anurognathid Pterosaurs Habib M, Hall J <i>University of Southern California</i> | The Relationship Between Leg Dominance and Knee Mechanics During the Cutting Maneuver Brown S, Dickin C, Wang H <i>Ball State University</i> | Poster Viewing |
| 4:00 PM | Designing Biomechanics Courses for Significant Learning: Fink Model Applied at Cal Poly Pomona Kang H <i>California State Polytechnic University, Pomona</i> | Suction and Skin: The Effect of Vacuum Loading on the Skin of a Common Dolphin Shorter K, Hurst T, Johnson M, Cramer S, Ketten D, Moore M <i>University of Michigan</i> | The Influence of Prophylactic Ankle Braces on Lower Limb Mechanics During a 90° Side-Step Cutting Task Yang H, Boros R, Davies B <i>Texas Tech University</i> | Muscle Force Estimates During the Weight-Acceptance Phase of Single-Leg Jump Landing Morgan K, Donnelly C, Reinbolt J <i>University of Tennessee</i> |
| 4:15 PM | Problem- and Project-Based Learning in Bioengineering: A Case Study Smeesters C, Berube-Lauziere Y, Rancourt D, Langelier E, Balg F, Fontaine R <i>Universite de Sherbrooke</i> | Control of the Cat Paw Trajectory During Walking on a Flat Surface and Horizontal Ladder Klishko A, Farrell B, Beloozerova I, Latash M, Prilutsky B <i>Georgia Institute of Technology</i> | Neuromuscular Asymmetries and Deficiencies of Active Adolescent Volleyball Players with Patello-femoral Pain Di Stasi S, Myer G, Wertz J, Stammen K, Hewett T <i>The Ohio State University, Sports Health and Performance Institute</i> | Peak and Nonuniform Fiber Stretch Increase in the Biceps Femoris Long Head Muscle at Faster Sprinting Speeds Fiorentino N, Chumanov E, Thelen D, Blemker S <i>University of Virginia</i> |
| 4:30 PM | A Tool for Evaluating Individual Contribution in Teamwork Doucet P <i>Universite de Sherbrooke</i> | Muscle Activation Strategy in the Sand-Swimming Sandfish Lizard (<i>Scincus Scincus</i>) Sharpe S, Goldman D <i>Georgia Institute of Technology</i> | Lower Extremity Work is Associated with Club Head Velocity During the Golf Swing in Experienced Golfers McNally M, Yontz N, Chaudhari A <i>Ohio State University Wexner Medical Center</i> | Comparison of Patella Bone Stress Between Individuals with and Without Patellofemoral Pain Ho K, Powers C <i>University of Southern California</i> |
| 4:45 PM | Intervention for Improving Project Teams Doucet P <i>Universite de Sherbrooke</i> | A Quadrupedal Postural Controller with Physiological Delays Reveals the Need for Multi-Level Stability Bunderson N <i>Georgia Institute of Technology</i> | Bilateral Analysis of the Shoulder Internal Rotation Passive Torque-Angle Relationship for Elite Pitchers with Glenohumeral Internal Rotation Deficit Wight J, Grover G, Larkin K, Livingston B, Tillman M, <i>University of North Florida</i> | The Influence of Increased DOF in the Knee Joint on Muscle Activation Timings and Forces in a Musculoskeletal Model Roos P, Jonkers I, Button K, van Deursen R <i>Cardiff University</i> |

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| | CENTURY A TEACHING SYMPOSIUM <i>Session Chairs: Cecile Smeester, Erika Nelson-Wong</i> | CENTURY B OVERFLOW CYPRESS COMPARATIVE <i>Session Chairs: K. Alex Shorter, Raziel Riemer</i> | CENTURY C OVERFLOW LIVE OAK SPORTS <i>Session Chairs: Glen Fleiseg, Matt Seeley</i> | AZALEA THEMATIC POSTERS COMPUTATIONAL BIOMECHANICS <i>Session Chairs: Karen Troy, Silvia Blemker</i> |
|---------|--|---|---|--|
| 5:00 PM | Panel Discussion | Joint Kinematics in Chimpanzee and Human Bipedal Walking Lee L, O'Neill M, Demes B, LaBoda M, Thompson N, Larson S, Stern J, Umberger B <i>University of Massachusetts Amherst</i> | Batting Cage Performance of Various Youth Baseball Bats Crisco J, Rainbow M, Wilcox B, Schwartz J <i>Department of Orthopaedics, Warren Alpert Medical of Brown University and Rhode Island Hospital</i> | An Adaptive Tabu Search Optimization Algorithm for Generating Forward Dynamics Simulations of Human Movement Vistamehr A, Neptune R <i>Mechanical Engineering Department, The University of Texas, Austin</i> |

ORAL PRESENTATIONS | SATURDAY, AUGUST 18, 8:00 - 9:30 AM

| | CENTURY A CLINICAL GAIT <i>Session Chair: Cara Lewis, Mary Rodgers</i> | CENTURY B OVERFLOW CYPRESS UPPER EXTREMITY <i>Session Chairs: Steven Charles, Laurel Kaxhaus</i> | CENTURY C OVERFLOW LIVE OAK KNEE 1 <i>Session Chairs: Li-Shan Chou, Ajit Chaudhari</i> | AZALEA THEMATIC POSTERS SEATING <i>Session Chairs: Tamara Bush, Stephen Sprigle</i> |
|---------|---|---|---|---|
| 8:00 AM | Development of a Dementia-Specific Gait Profile: Application of Signal Detection Theory Karakostas T, Hsiang S, Davis B <i>Rehabilitation Institute of Chicago</i> | Wrist Rotations Are Considerably Less Smooth than Reaching Movements Salmond L, Charles S <i>Brigham Young University</i> | Reliability of a Novel Proprioception Testing Device Rojas J, Blackburn T, Dahners L, Olcott C, Weinhold P <i>UNC Biomedical Engineering</i> | Poster Viewing |
| 8:15 AM | Positive Ankle Work is Affected by Peripheral Arterial Disease Yentes J, Wurdeman S, Pipinos I, Johanning J, McGrath D, Myers S <i>Nebraska Biomechanics Core Facility</i> | Motions of the Thumb Carpometacarpal (CMC) Joint Are Coupled During the Initiation of Three Functional Tasks Halilaj E, Rainbow M, Got C, Schwartz J, Ladd A, Weiss A, Moore D, Crisco J <i>Brown University, Providence, RI</i> | Evidence of Medial Maltracking in Patellofemoral Pain Behnam A, Boden B, Sheehan F <i>National Institutes of Health</i> | Bicycle Riding, Arterial Compression and Erectile Dysfunction Parthiban S, Yang C, Jones L, Baftiri A, Niederberger C <i>University of Illinois at Chicago</i> |

ORAL PRESENTATIONS | CONTINUED FROM PAGE 19

| | CENTURY A CLINICAL GAIT <i>Session Chair: Cara Lewis, Mary Rodgers</i> | CENTURY B OVERFLOW CYPRESS UPPER EXTREMITY <i>Session Chairs: Steven Charles, Laurel Kaxhaus</i> | CENTURY C OVERFLOW LIVE OAK KNEE 1 <i>Session Chairs: Li-Shan Chou, Ajit Chaudhari</i> | AZALEA THEMATIC POSTERS SEATING <i>Session Chairs: Tamara Bush, Stephen Sprigle</i> |
|------------|---|--|---|---|
| 8:30 AM | Is the Problem Really Foot-Drop? Little V, McGuirk T, Patten C <i>University of Florida</i> | An Iterative Learning Controller for an Elbow Simulator to Maintain Flexion Angle During Supination Schimoler P, Vipperman J, Miller M <i>University of Pittsburgh</i> | Sex Differences in Unconstrained Transverse Plane Kinematic Response Under Compression and Simulated Muscle Forces Wordeman S, Quatman C, Kiapour A, Ditto R, Goel V, Demetropoulos C, Hewett T <i>The Ohio State University</i> | Investigating the Etiology of Vibration-Induced Low Back Pain Craig T, Soltys J, Wilson S <i>University of Kansas</i> |
| 8:45 AM | Forefoot Orientation Angle Determines Duration and Amplitude of Pronation During Walking Monaghan G, Lewis C, Hsu W, Saltzman E, Hamill J, Holt K <i>Boston University</i> | Anterior and Middle Deltoid Are Functionally Critical Targets for Nerve Transfer Following C5-C6 Root Avulsion Injury Crouch D, Plate J, Li Z, Saul K <i>Department of Biomedical Engineering, Wake Forest School of Medicine</i> | Changes in in Vivo Knee Contact Force Through Gait Modification Hall A, Besier T, Silder A, Delp S, D'Lima D, Fregly B <i>University of Florida</i> | Factors Associated with Pressure Ulcers: The Effects of Shear Loads on Blood Flow Manorama A, Reid Bush T <i>Michigan State University</i> |
| 9:00 AM | Children with Cerebral Palsy Have Increased Variability in Their Stepping Pattern and Increased Cortical Activity During Gait Arpin D, Wilson T, Kurz M <i>University of Nebraska Medical Center</i> | A Scapulothoracic Joint Model for Fast and Accurate Simulations of Upper-Extremity Motion Seth A, Matias R, Veloso A, Delp S <i>Stanford University</i> | Increasing Running Step Rate Reduces Patellofemoral Joint Forces Lenhart R, Wille C, Chumanov E, Heiderscheit B, Thelen D <i>University of Wisconsin-Madison</i> | Tissue Deformation in the Seated Buttocks Model Sonenblum S, Cathcart J, Winder J, Sprigle S <i>Georgia Institute of Technology</i> |
| 9:15 AM | Locomotor Adaptive Learning is Impaired in Persons with Parkinson's Disease Roemmich R, Nocera J, Hass C <i>University of Florida</i> | Kinematic Variability at the Shoulder is Not Related to Shoulder Pain During Manual Wheelchair Propulsion Longworth J, Troy K <i>University of Illinois at Chicago</i> | Toe-In Gait Reduces the First Peak in the Knee Adduction Moment During Walking in Knee Osteoarthritis Patients Shull P, Shultz R, Silder A, Besier T, Cutkosky M, Delp S <i>Stanford University Center</i> | Effect of Seat Position Modifications on Upper Extremity Mechanical Loading During Manual Wheelchair Propulsion Requejo P, Mulroy S, Munaretto J, Mendoza Blanco M, Wagner E, McNittGray J <i>Rancho Los Amigos National Rehabilitation Center</i> |

ORAL PRESENTATIONS | SATURDAY, AUGUST 18, 10:00 AM - 11:15 AM

| | CENTURY A GAIT 2: ANALYSIS <i>Session Chairs: Rakie Cham, April Chambers</i> | CENTURY B OVERFLOW CYPRESS SPINE <i>Session Chairs: Dennis Anderson, Ting Xia</i> | CENTURY C OVERFLOW LIVE OAK KNEE 2: ACL <i>Session Chairs: Daniel Herman, Terese Chmielewski</i> | AZALEA THEMATIC POSTERS MUSCLE 2: IMAGING <i>Session Chairs: Ben Intantolino, Darryl Thelen</i> |
|----------|---|--|---|--|
| 10:00 AM | Task-Specific Differences in the Cortical Contribution to Walking Are Revealed by 30-60hz Oscillatory EMG Activity Clark D, Kautz S, Bauer A, Chen Y, Christou E <i>Malcom Randall VA Medical Center</i> | Viscoelastic Modeling of the Lumbar Spine: The Effect of Prolonged Flexion on Internal Loads Toosizadeh N, Nussbaum M, Madigan M <i>Virginia Tech</i> | Knee Articular Cartilage Pressure Distribution Under Single- and Multi-Axis Loading Conditions: Implications for ACL Injury Mechanism Kiapour A, Quatman C, Goel V, Ditto R, Wordeman S, Levine J, Hewett T, Demetropoulos C <i>University of Toledo</i> | Poster Viewing |
| 10:15 AM | Effects of Fractional Anisotropy in the Corpus Callosum As Determined by Diffusion Tensor Imaging on Temporal Variability in Older Adults Sukits A, Ledgerwood A, Haney J, Chambers A, Cham R, Aizenstein H, Nebes R <i>University of Pittsburgh</i> | Forward Bending with Increased Erector Spinae Force Helps Reduce Disk Herniation Risk Rundell S, Weaver B <i>Armstrong Forensic Engineers</i> | On the Fatigue Life of the Anterior Cruciate Ligament During Simulated Pivot Landings Lipps D, Wojtys E, Ashton-Miller J <i>University of Michigan</i> | Comparison of Sarcomere Heterogeneity Measured in Passive Live and Fixed Muscle Sandercock T, Cash A, Tresch M <i>Northwestern University</i> |
| 10:30 AM | Changes in Spatiotemporal Gait Characteristics When Anticipating Slippery Floors in Young and Older Adults Chambers A, Cham R <i>University of Pittsburgh</i> | Helical Axis Patterns of Motion for the Healthy to Severely Degenerated Lumbar Intervertebral Disc Ellingson A, Nuckley D <i>University of Minnesota</i> | Are Internal-External Rotational Moments in ACL Deficient Subjects Different than Those in Healthy Subjects? Lanier A, MacLeod T, Manal K, Buchanan T <i>University of Delaware</i> | Pennation Angle Variability in Human Whole Muscle Infantolino B, Challis J <i>Penn State Berks</i> |
| 10:45 AM | Manipulation of the Structure of Gait Variability with Rhythmic Auditory Stimulus Hunt N, Haworth J, McGrath D, Myers S, Stergiou N <i>Nebraska Biomechanics Core Facility</i> | Characterization of Interlamellar Shear Properties of the Annulus Fibrosus Han S, Chen C, Chen Y, Hsieh A <i>University of Maryland</i> | Control of Coronal Plane Kinematics and Kinetics During a Single Leg Hop for Distance in Individuals with Anterior Cruciate Ligament Injury Roos P, Button K, Rimmer P, van Deursen R <i>Cardiff University</i> | Posture and Activation Dependent Variations in Shear Wave Speed in the Gastrocnemius Muscle and Aponeurosis Chernak L, DeWall R, Thelen D <i>University of Wisconsin-Madison</i> |
| 11:00 AM | Age Differences in the Stabilization of Swing Foot Trajectory in the Frontal Plane Krishnan V, Rosenblatt N, Latash M, Grabiner M <i>University of Illinois, Chicago</i> | Associations of Costal Cartilage Calcification with Prevalent Vertebral Fractures in Older Adults Anderson D, Allaire B, Bouxsein M <i>Beth Israel Deaconess Medical Center</i> | Knee Joint Loading After ACL Reconstruction: Influence of Graft Type Manal K, Gardinier E, Snyder-Mackler L, Buchanan T <i>University of Delaware</i> | On the Ascent: The Soleus Operating Length is Conserved to the Ascending Limb of the Force-Length Curve Across Gait Mechanics in Humans Rubenson J, Neville P, Heok L, Pinniger G, Shannon D <i>The University of Western Australia</i> |

AWARD PRESENTATIONS | SATURDAY, AUGUST 18, 11:30 AM - 12:00 PM

AWARDS | SATURDAY

YOUNG SCIENTIST PRE-DOC AWARD

11:30 - 11:45 AM

PHILLIPS CENTER FOR PERFORMING ARTS

JACOB ELKINS, University of Iowa

*Expedited Computational Analysis of Fracture of Ceramic
THA Liners: Obesity and Stripe Wear Considerations*

YOUNG SCIENTIST POST-DOC AWARD

11:45 AM - 12:00 PM

PHILLIPS CENTER FOR PERFORMING ARTS

METIN YAVUZ, PH.D., Ohio College of Podiatric Medicine

Plantar Shear Stress and its Clinical Implications

ORAL PRESENTATIONS | SATURDAY, AUGUST 18, 2:00 - 3:30 PM

ORAL PRESENTATIONS | SATURDAY

| | CENTURY A FALLS <i>Session Chair: Kurt Beschorner, Pilwon Hur</i> | CENTURY B OVERFLOW CYPRESS COMPUTATIONAL MODELING <i>Session Chairs: Sukyung Park, Melissa Morrow</i> | CENTURY C OVERFLOW LIVE OAK RUNNING <i>Session Chair: Irene Davis, Iain Hunter</i> | AZALEA THEMATIC POSTERS POWERED EXOSKELETONS & PROSTHETICS <i>Session Chairs: Liz Hsiao-Wecksler, Matthew Major</i> |
|------------|---|--|--|---|
| 2:00 PM | Momentum Control Strategies During Walking in Elderly Fallers Fujimoto M, Chou L <i>University of Oregon</i> | Computational Model of Maximum-Height Single-Joint Jumping Predicts Bouncing As an Optimal Strategy van Werkhoven H, Piazza S <i>Penn State University</i> | Tibial Stresses in Habitual and Converted Forefoot and Rearfoot Strike Runners Derrick T, Edwards W, Rooney B <i>Iowa State University</i> | Poster Viewing |
| 2:15 PM | Effects of Age and Experience on Foot Clearance During Up and Down Stepping Beschorner K, Milanowski A, Tomashak D, Smith R <i>University of Wisconsin-Milwaukee</i> | Development of a Subject-Specific Vertical Ground Contact Force Model Jackson J, Hass C, Fregly B <i>University of Florida</i> | Comparison of Tibial Strains and Strain Rates in Barefoot and Shod Running Altman A, Davis I <i>Biomechanics and Movement Science, University of Delaware</i> | Magnitude and Time Course of Adaptation During Walking with a Passive Elastic Exoskeleton Charalambous C, Dean J <i>Medical University of South Carolina</i> |
| 2:30 PM | Anterior, But Not Posterior Compensatory Stepping Thresholds, Are Reduced with Increasing Age Crenshaw J, Grabiner M <i>University of Illinois at Chicago</i> | Modeling of Head Injury Response for Translational and Rotational Impacts of Varying Directions and Magnitudes Stitzel J, Weaver A, Danelson K <i>Virginia Tech - Wake Forest University Center for Injury Biomechanics</i> | The Influence of Step Frequency on Muscle Activity During Downhill Running Sheehan R, Lutz R, Gottschall J <i>The Pennsylvania State University</i> | Biomechanical and Metabolic Implications of Wearing a Powered Exoskeleton to Carry a Backpack Load Gregorczyk K, Adams A, O'Donovan M, Schiffman J, Bensel C, Brown M <i>U.S. Army Natick Soldier Research, Development and Engineering Center</i> |

ORAL PRESENTATIONS | CONTINUED FROM PAGE 22

| | CENTURY A FALLS <i>Session Chair: Kurt Beschoner, Pilwon Hur</i> | CENTURY B OVERFLOW CYPRESS COMPUTATIONAL MODELING <i>Session Chairs: Sukyung Park, Melissa Morrow</i> | CENTURY C OVERFLOW LIVE OAK RUNNING <i>Session Chair: Irene Davis, Iain Hunter</i> | AZALEA THEMATIC POSTERS POWERED EXOSKELETONS & PROSTHETICS <i>Session Chairs: Liz Hsiao-Wecksler, Matthew Major</i> |
|------------|---|---|---|---|
| 2:45 PM | Effect of Age and Lean Direction on the Threshold of Balance Recovery in Younger, Middle-Aged and Older Adults Carbonneau E, Smeesters C <i>Universite de Sherbrooke</i> | Simple FE Models of the Forefoot for Use in the Design of Therapeutic Footwear for Diabetic Patients Spirka T, Erdemir A, Cavanagh P <i>University of Washington</i> | A Test of the Metabolic Cost of Cushioning Hypothesis in Barefoot and Shod Running Tung K, Franz J, Kram R <i>University of Colorado</i> | The Effects of Wearing a Spring-Loaded Ankle Exoskeleton on Soleus Muscle Mechanics During Two-Legged Hopping in Humans Farris D, Sawicki G <i>North Carolina State University & UNC-Chapel Hill</i> |
| 3:00 PM | Kinematics, Kinetics and Muscle Activation Patterns of the Upper Extremity During Simulated Forward Falls. Burkhart T, Clarke D, Andrews D <i>Western University</i> | A Computational Model for Convection-Enhanced Delivery in a Hind Limb Tumor Magdoom-Mohamed K, Pishko G, Sartinoranont M <i>University of Florida</i> | Vertical Load Distribution in the Metatarsals During Shod Running Becker J, Howey R, Osternig L, James S, Chou L <i>University of Oregon</i> | Gait Mode Recognition Using an Inertia Measurement Unit on a Powered Ankle-Foot-Orthosis Li Y, Hsiao-Wecksler E <i>University of Illinois at Urbana-Champaign</i> |
| 3:15 PM | Clinical Balance Measures Are Associated with Variability of Inter-Joint Coordination During Walking in Elderly Adults Chiu S, Chou L <i>University of Oregon</i> | Is Push-Off Propulsion Energetically Optimal for Accelerated Gait? Oh K, Baek J, Ryu J, Park S <i>Korea Advanced Institute of Science and Technology (KAIST)</i> | Modulation of Stiffness on Impact Loadings During Running Cheung R, Rainbow M, Altman A, Davis I <i>Harvard Medical School</i> | Electromyographic Effects of Using a Powered Ankle-Foot Prosthesis Williams M, Grabowski A, Herr H, D'Andrea S <i>Center for Restorative and Regenerative Medicine, PVAMC</i> |



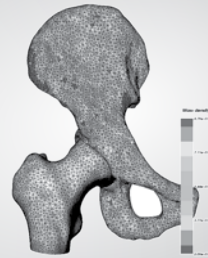
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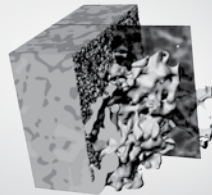
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POSTER SESSION OVERVIEW & QUICK REFERENCE

POSTER PRESENTATIONS

At least one named author is required to be present at each poster during its designated poster session. **There will be two formal poster sessions:**

POSTER SESSION 1: THURSDAY, FROM 3:30 - 6:30 PM

POSTER SESSION 2: FRIDAY, FROM 8:00 - 11:00 AM

General posters must be mounted by 3:15 pm (Thursday) or 7:45 am (Friday) and removed by 6:45 pm (Thursday) and 11:15 am (Friday). Any poster not removed will be discarded. Posters from Thematic Poster Sessions will also be viewed during these general poster sessions. Odd-numbered posters will be presented during the first 90 minutes of the session. Even-numbered posters will be presented during the second 90 minutes of the session.

POSTER SESSION 1

| TOPIC | POSTER # | LOCATION | PAGE |
|-------------------------|----------|------------|-------|
| BONE | 1-5 | HICKORY | 27 |
| CELL & TISSUE MECHANICS | 6-12 | HICKORY | 27 |
| CLINICAL | 134-156 | BALLROOM A | 37,38 |
| COMPUTATIONAL MODELING | 37-50 | DOGWOOD | 30 |
| ERGONOMICS | 80-90 | BALLROOM A | 33 |
| FALLS | 103-113 | BALLROOM A | 35 |
| IMAGING | 17-24 | HICKORY | 28 |
| JOURNAL AWARDS | J1-J4 | AZALEA | 26 |
| LOWER EXTREMITY | 91-102 | BALLROOM A | 34 |
| METHODS | 51-64 | BALLROOM A | 31 |
| MOTOR CONTROL | 65-79 | BALLROOM A | 32 |
| MUSCLE | 13-16 | HICKORY | 28 |
| OBESITY | O1-O4 | AZALEA | 26 |
| ORTHOPEDICS | 25-36 | DOGWOOD | 29 |
| POSTURE & BALANCE | 114-133 | BALLROOM A | 36,37 |
| REHABILITATION | 157-168 | BALLROOM A | 39 |
| STROKE | S1-S4 | AZALEA | 26 |
| WHEELCHAIR BIOMECHANICS | 169-172 | BALLROOM A | 39 |

POSTER SESSION 2

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| COMPUTATIONAL BIOMECHANICS | C1-C5 | AZALEA | 40 |
| GAIT | 277-313 | BALLROOM A | 48-50 |
| INSTRUMENTATION | 271-276 | BALLROOM A | 48 |
| KNEE | 176-192 | DOGWOOD | 41,42 |
| MUSCLE | M1-M4 | BALLROOM A | 53 |
| POWERED EXOSKELETONS | P1-P5 | BALLROOM A | 53 |
| PROSTHETICS & ORTHOTICS | 314-332 | BALLROOM A | 51,52 |
| RUNNING | 221-241 | BALLROOM A | 44,45 |
| SEATING | S1-S5 | BALLROOM A | 52 |
| SPORTS | 242-270 | BALLROOM A | 46,47 |
| SPINE | 193-202 | DOGWOOD | 42,43 |
| UPPER EXTREMITY | 203-220 | HICKORY | 43,44 |
| | | | |
| | | | |

POSTER SESSION 1 | THURSDAY, 3:30 - 6:30

AZALEA (THURSDAY THEMATIC POSTERS)

STROKE

ODD NUMBERS PRESENT 5:00 - 6:30

- S1 Scapulohumeral Kinematics in Individuals with Upper Extremity Impairment from Stroke

Finley M, Combs S

Krannert School of Physical Therapy University of Indianapolis

- S3 Comparison of Module Quality and Walking Performance of Hemiparetic Subjects Pre and Post Locomotor Rehabilitation Therapy

Routson R, Clark D, Bowden M, Kautz S, Neptune R

Department of Mechanical Engineering, The University of Texas at Austin

EVEN NUMBERS PRESENT 3:30 - 5:00

- S2 Gait Training with Visual and Proprioceptive Feedback Improves Overground Propulsive Forces in People Post-Stroke

Wutzke C, Michael L

University of North Carolina at Chapel Hill

- S4 Distinct Patterns of Recovery Following Therapeutic Intervention Post-Stroke: Responders vs. Non-Responders

Patil S, Patten C

University of Florida

OBESITY

ODD NUMBERS PRESENT 5:00 - 6:30

- O1 The Issue of Tissue: A Comparison of Kinematic Models in Obese Adults

Board W, Haight D, Browning R

Colorado State University

- O3 Impact of Obesity on the Function of Hip Knee and Ankle During Transition Between Level and Stair Walking

Umezaki K, Ramsey D

University at Buffalo

- O2 Changes in Gait Over a 30 Minute Walking Session in Obese Individuals Do Biomechanical Loads Increase in Pursuit of Weight Loss?

Singh B, Janz K, Yack H

University of Iowa

- O4 Obesity Modifies Canine Gait

Brady R, Sidiropoulos A, Bennett H, Rider P, Domire Z, DeVita P

East Carolina University

OBESITY

ODD NUMBERS PRESENT 5:00 - 6:30

- J1 Do Skeletal Muscle Properties Recover Following Repeat Botulinum Toxin Type-A Injections?

Fortuna R, Horisberger M, Vaz M, Herzog W

University of Calgary

- J3 Compressive Loading of the Distal Radius Improves Bone Structure in Young Women

Troy K, Bhatia V, Edwards W

University of Calgary University of Illinois at Chicago

EVEN NUMBERS PRESENT 3:30 - 5:00

- J2 Plantar Shear Stress Distributions in Diabetic Patients with and Without Neuropathy

Yavuz M, Franklin A, McGaha R, Prakash V, Rispoli J, Stuto J, Torrence G, Lowell D, Canales M

Ohio College of Podiatric Medicine

- J4 Simulation Predictions of Prosthetic Foot and Muscle Function in Response to Altered Foot Stiffness During Below-Knee Amputee Gait

Fey N, Klute G, Neptune R

The University of Texas at Austin

POSTER SESSION 1 | THURSDAY, 3:30 - 6:30

HICKORY

BONE

ODD NUMBERS PRESENT 5:00 - 6:30

EVEN NUMBERS PRESENT 3:30 - 5:00

- 1 A Linear Actuated Torsional Device to Replicate Clinically Relevant Spiral Fractures in Long Bone
Edwards W, Troy K
University of Illinois at Chicago

- 2 DXA Derived Measures of Bone Mineral Can Reliably Predict Mechanical Behavior of Proximal Tibias Loaded in Torsion
Edwards W, Troy K
University of Illinois at Chicago

- 3 The Influence of Occlusal Splinting on the Trabecular Morphology in the Sagittal Plane of the Temporomandibular Joint
Zaylor W, Sindelar B, Cotton J
Ohio University, Mechanical Engineering

- 4 Variability of Strain and Strain Rate in the Human Tibial Diaphysis During Walking
Rooks T, Leib D, Sasaki K, Dugan E
US Army Aeromedical Research Laboratory

- 5 A Modeling Framework for Examining Changes in Femoral Strength due to Long Duration Bedrest
Genc K, Cavanagh P
Simpleware Ltd.

CELL & TISSUE MECHANICS

ODD NUMBERS PRESENT 5:00 - 6:30

EVEN NUMBERS PRESENT 3:30 - 5:00

- 7 A Protocol to Assess the Contribution of the Components of Human Abdominal Wall to Its Biomechanical Reponse
Tran D, Mitton D, Voirin D, Guerin G, Turquier F, Beillas P
Universite de Lyon, France

- 6 Mapping the Mechanical Topography of Healthy Tibial Cartilage
Deneweth J, Sylvia S, Newman K, McLean S, Arruda E
University of Michigan

- 9 Loading History of the Mechanical Properties of Human Heel Pads
Gales D, Challis J
Pennsylvania State University

- 8 A Micromechanical Analysis on Diffuse Axonal Injury for Heterogeneous Brain Tissue
Soheilypour M, Khorshidi M, Peyro M, Abolfathi N, Naei M
University of Tehran

- 11 Physiologically Modeled Shear Stress As a Function of Pulse Frequency: Driving Endothelial Cells Toward a Quiescent Phenotype
Uzarski J, McFetridge P
University of Florida

- 10 Optically Based Indentation for Brain Tissue: A New Histological Approach
Canchi S
University of Florida

- 12 Boundary Conditions Affect Mechanical Behavior of In-Situ Chondrocytes
Moo E, Han S, Jinha A, Abusara Z, Abu Osman N, Pingguan-Murphy B, Herzog W
University of Malaya

POSTER SESSION 1 | THURSDAY, 3:30 - 6:30

HICKORY

MUSCLE

ODD NUMBERS PRESENT 5:00 - 6:30

- 13 Training Induced Changes in Quadriceps Activation During Maximal Eccentric Contractions
Voukelatos D, Pain M
School of Sport, Health and Exercise Sciences, Loughborough University

- 15 The Role of the Latissimus Dorsi Muscle in Pelvic Girdle and Trunk Rotations
Patel J, Sumner A, Fox J, Romer B, Rehm J, Campbell B, Weimar W
Auburn University

EVEN NUMBERS PRESENT 3:30 - 5:00

- 14 Aging is All Relative: Modeling the Relationship Between Strength and Fatigue on Endurance Time in Older Adults
Frey Law L, Avin K, Tumuluri A
The University of Iowa

- 16 Muscle Stiffness and Response to Exercise in Caloric Restricted and Ad Libitum-Fed Elderly Rats
Pauwels L, Dowling B, Okafor N, Breighner R, Domire Z
Texas Tech University

IMAGING

ODD NUMBERS PRESENT 5:00 - 6:30

- 17 Static Comparison of Subtalar Joint Neutral and Neutral Cushioning Running Shoes to Barefoot Stance Using Markerless Radiostereometric Analysis
Balsdon M, Bushey K, Dombroski C, Jenkyn T
University of Western Ontario

- 19 Geometric Accuracy of Physical and Surface Models Created from Medical Image Data
McCoy S, Piller G, Collins C, Sokn S, Ploeg H
University of Wisconsin Madison

- 21 Automated Analysis of 3D Glenoid Version
Ghafurian S, Galdi B, Tan V, Li K
Rutgers University

- 23 Reliability of Lumbar Vertebra Position and Orientation Measurement Using Weight-Bearing MRI
Simons C, Davidson B, Cobb L
University of Denver

EVEN NUMBERS PRESENT 3:30 - 5:00

- 18 A Framework for Visualizing Biomechanical Movement for Designers Within 3D Modeling Programs
Schwartz M, Viswanathan J
University of Michigan

- 20 Thalamic Projection Fiber Integrity in De Novo Parkinson's Disease
Planetta P, Schulze E, Geary E, Goldman J, Corcos D, Little D, Vaillancourt D
University of Florida

- 22 An MRI-Compatible Device for Obtaining Patient-Specific Plantar Soft Tissue Material Properties
Stebbins M, Fassbind M, Cavanagh P, Haynor D, Chu B, Ledoux W
VA Puget Sound

- 24 Measurement of MTPJ Cartilage Thickness Distribution Using 14T MRI
Kumar A, Lee D, Cavanagh P
Asian Institute of Tele-surgery

ORTHOPEDICS

ODD NUMBERS PRESENT 5:00 - 6:30

25 A Markov Chain Model Predicts Early Failure of Rotator Cuff Tear Repairs
Donnell D, Carpenter J, Miller B, Hughes R
University of Michigan Department of Orthopaedic Surgery

27 Is There a Gold Standard for Rotational Alignment of the Tibial Component During TKA?
Hutter E, Granger J, Beal M, Siston R
The Ohio State University

29 Does Interlimb Kinematic Symmetry Exist During Stair Ascent After Unicompartmental Knee Arthroplasty?
Simpson K, Fu Y, Kinsey T, Brown-Crowell C, Mahoney O
University of Georgia Biomechanics Laboratory

31 Loading Patterns During a Step-Up-And-Over Task in Individuals Following Total Knee Arthroplasty
Pozzi F, Alnhadi A, Zeni J, Snyder-Mackler L
University of Delaware

33 Asymmetric Morphology of the Hamstring Muscles Following ACL Autografts
Suydam S, Manal K, Buchanan T
University of Delaware

35 Computer Planning of Arthroscopic Femoroacetabular Impingement Surgery
Li J, Theiss M
Inova Fairfax Hospital

EVEN NUMBERS PRESENT 3:30 - 5:00

26 Design Study of Stability and Safety of Median Sternotomy Fixation
Price N, Kim N, Wilcox B, Hatcher B
University of Florida

28 Kinematical and Load Sharing Effect of a Novel Posterior Dynamic Stabiization System Implanted in Lumbar Spine
Erbulut D, Kiapour A, Oktenoglu T
Koc University

30 Biomechanical Effects of Component Alignment Variability in Total Knee Arthroplasty: A Computer Simulation Study of an Oxford Rig
Lemke S, Beal M, Piazza S, Siston R
The Ohio State University

32 Computer Navigation As an Investigational Tool for ACL Reconstruction
Drewniak-Watts E, Shalvoy R, D'Andrea S
Providence VA Medical Center; Alpert Medical School of Brown University

34 Comparison of Stress Distribution Patterns Within Trigonal, Quadrangle, and Hexagonal Srew Drive Designs of an ACL Interference Screw Using Finite Element Analysis
Flowers J, McCullough M
North Carolina A&T State University

36 Computer Methods for Designing Artificial Talus Bone in Ankle Joint
Islam K, Dobbe A, Adeeb S, El-Rich M, Duke K, Jomha N
University of Alberta

COMPUTATIONAL MODELING

ODD NUMBERS PRESENT 5:00 - 6:30

EVEN NUMBERS PRESENT 3:30 - 5:00

37 Comparison of Finger Interaction Matrix Computation Techniques
Martin J, Terekhov A, Latash M, Zatsiorsky V
Penn State

39 Development of an Efficient Fluid-Structure Interaction Solver for Applications to the Vascular System
Fernandez C, Berceci S, Garbey M, Kim N, Tran-Son-Tay R
University of Florida

41 Patient-Specific Musculoskeletal Modeling for Evaluating the Efficacy of Meniscus Transplantation
Zheng L, Aiyangar A, Carey R, Lippert C, Harner C, Zhang X
University of Pittsburgh

43 A Novel Statistical Method for EMG-To-Moment Estimation During Gait
Meyer A, Patten C, Fregly B
University of Florida

45 Residual Elimination Algorithm Improvements for Forward Dynamic Simulation of Gait
Jackson J, Hass C, Fregly B
University of Florida

47 Ulna Simulation Assesses Sensitivity to Bone Elastic Modulus Variations in a MRTA Test
Cotton J, Bowman L, Stroud C
Ohio University

49 Is Push-Off Propulsion Energetically Optimal for Accelerated Gait?
Oh K, Baek J, Ryu J, Park S
Mechanical Engineering dept. KAIST

38 Modeling the Demands of a Dance Jump: A Mismatch Between Mechanical Demands and Aesthetic Constraints
Jarvis D, Valero-Cuevas F
University of Southern California

40 Effects of Exercises for Prevention of Femoral Neck Fracture Based on Dynamics and Finite-Element Moel Simulation
Qian J, Zhang H, Li Z, Bian R, Zhang S
Nanjing Institute of Physical Education, Nanjing

42 Finite Element Modeling of Interaction of Implantable Cardiac Rhythm Devices During Frontal Motor Vehicle Deceleration Injuries
Belwadi A, Jacob S, Repalle T, Yang K
Biomedical Engineering Department, Wayne State University, Detroit, MI

44 A Phenomenological Human Energy Expenditure Model in Joint Space
Roberts D, Kim J
Polytechnic Institute of New York University

46 Hamstrings Weakness Increases ACL Loading During Sidestep Cutting
Weinhandl J, Earl-Boehm J, Ebersole K, Huddleston W, Armstrong B, O'Connor K
Old Dominion University

Highly Automated Methods for Subject-Specific, Population-Wide Investigations of Habitual Contact Stress Exposure in the Knee
Kern A, Segal N, Lynch J, Sharma L, Anderson D
University of Iowa

50 The Importance of Accounting for Knee Laxity When Simulating Gait
Schmitz A, Thelen D
University of Wisconsin-Madison

METHODS

ODD NUMBERS PRESENT 5:00 - 6:30

EVEN NUMBERS PRESENT 3:30 - 5:00

51 Statistically-Significant Contrasts Between EMG Waveforms Revealed Using Wavelet-Based Functional Anova
McKay J, Welch T, Vidakovic B, Ting L
Emory University and Georgia Institute of Technology

53 Inter-Segmental Coordination Variability During Locomotion - Do Different Analytical Approaches Tell the Same Story?
Armour Smith J, Gordon J, Kulig K
University of Southern California

55 EMG Normalization Techniques for Patients with Pain
Ettinger L, Weiss J, Karduna A
University of Oregon

57 A Robust Kinematic Based Event Detection Algorithm That Works for Walking and Running on Both Uphill and Downhill Surfaces
Sheehan R, Gottschall J
The Pennsylvania State University

59 Surgical Simulation Validating Methods to Improve Orthopaedic Resident Skills Competency
Ohrt G, Karam M, Thomas G, Kho J, Yehyaw T, Marsh J, Anderson D
University of Iowa

61 Quantification Impaction System for a Large Survival Model of Intraarticular Fracture
Diestelmeier B, Rudert M, Tochigi Y, Baer T, Fredericks D, Brown T
University of Iowa

63 Neural Networks Based Identification of Joint Moments Using Nonlinear Model of Sit-To-Stand
Abdulrahman A, Iqbal K
University of Arkansas at Little Rock

52 Study on Anthropometric Measurement on Korean Skeletal Systems Based on Cadaveric CT Images
Ko C, Cho D, Chun K
Gerontechnology R&D Group, Korea Institute of Industrial Technology (KITECH)

54 Designing Training Sample Size for Support Vector Machines Based on Kinematic Gait Data
Fukuchi R, Stirling L, Ferber R
University of Calgary

56 Inertial Estimate Errors for Female Arms and Legs from Different Body Models
Wicke J, Dumas G
William Paterson University

58 A Comparison of Position Measurement Accuracy Using Two Different Camera Arrangements
Denning W, Hunter I, Seeley M
Brigham Young University

60 Evaluating Knee Stability After Total Knee Arthroplasty Using Inertial Measurement Units
Roberts D, Khan H, Kim J, Slover J, Walker P
Polytechnic Institute of New York University

62 Empirical Plantar Pressure Insole Pose Estimation
Sinsel E, Lebidowska M, Buczek F
NIOSH

64 Kinect Abnormal Involuntary Motion Assessment System: Increased Reliability of Testing for Tardive Dyskinesia
Szajnberg L, Roberts D, Karlin D
New York University

MOTOR CONTROL

ODD NUMBERS PRESENT 5:00 - 6:30

EVEN NUMBERS PRESENT 3:30 - 5:00

65 Adaptive Changes in Finger Force Variance in Response to Index Finger Fatigue in Unimanual and Bimanual Tasks
Singh T, Zatsiorsky V, Latash M
Pennsylvania State University

67 Performance Optimality and Variability Studied at the Level of Hypothetical Commands
Martin J, Terekhov A, Latash M, Zatsiorsky V
Penn State

69 Two-Weeks of Unloaded Precision Training Improves Motor Performance in Older Adults to the Level of Young Adults
Baweja H, Larkin K, Tanner E, Moore M, Christou E
University of Florida

71 The Effects of Visual Feedback and Aging on Force Oscillations Within 0-1 Hz
Fox E, Baweja H, Kim C, Vaillancourt D, Christou E
University of Florida

73 Impaired Endpoint Accuracy in Older Adults is Associated with Greater Time Variability
Kwon M, Chen Y, Reid J, Fox E, Christou E
University of Florida

75 Kinematics and Kinetics of Stair Ascent while Dual-Tasking
Vallabhajosula S, Tan C, Davidson A, Mukherjee M, Siu K, Yentes J, McGrath D, Myers S
Nebraska Biomechanics Core Facility, University of Nebraska at Omaha

77 Task Difficulty Exacerbates the Age Associated Differences in Force Control
Kim C, Onushko T, Christou E
Neuromuscular Physiology Lab, APK, HHP, University of Florida

79 Interhemispheric Inhibition and Motor Lateralization: Relationship to Age
Lodha N, Corti M, Triggs W, Patten C
University of Florida

66 Non-Negative Matrix Factorization Applied to a Feedback System
van Antwerp K, Burkholder T
Georgia Institute of Technology

68 Coupling of Oscillatory Motion: The Impact of Voluntary and Physiological Tremor on Posture
Morrison S, Cortes N, Kerr G, Newell K
Old Dominion University

70 Sensory Reweighting for Visually Induced Roll Tilt Perception Under Sensory Conflict Conditions
Lim H, Park H, Park S
KAIST

72 Endpoint Instructions Result in Higher Proprioceptive Acuity than Joint Angle Instructions
Hyler J, Karduna A
University of Oregon

74 Maximum Voluntary Force Production Changes with Visual Feedback Modulation During Multi-Finger Pressing
Karol S, Kwon H, Koh K, Shim J
University of Maryland, College Park

76 Older Adults Exhibit an Impaired Ability to Predict Movement Accuracy due to Greater Motor Output Variability
Chen Y, Kwon M, Reid J, Fox E, Christou E
University of Florida

78 Trial-To-Trial Control Dynamics in Redundant Reaching Tasks
Smallwood R, Cusumano J, Dingwell J
University of Texas at Austin

ERGONOMICS

ODD NUMBERS PRESENT 5:00 - 6:30

- 81 Study on Lumbar Morphological Measurements of Korean Adults and the Elderly
Lee E, Kang I, Park S, Yang J, Cho D, Ko C, Chun K
Korea University Guro Hospital
-
- 83 The Effects of Load Carriage and Fatigue on Frontal-Plane Knee Mechanics During Walking
Wang H, Frame J, Ozimek E, Leib D, Dugan E
Ball State University
-
- 85 Intersegmental Adaptation of Lumbar Spine on Different Load-Carrying Types
Shin J, Park Y, Kim Y, Kim Y
University of Kyung Hee
-
- 87 Lower Limb Coordination is Altered During Asymmetric Load Carrying while Walking on a Treadmill
Wang J, Roemmich R, Tillman M
University of Florida
-
- 89 A Nonlinear Hand-Arm Model for Interaction with Impulsive Forces
Ay H, Luscher A, Sommerich C, Berme N
The Ohio State University

EVEN NUMBERS PRESENT 3:30 - 5:00

- 80 Study on Wheelbase Design Parameters of a Shower Carrier Through Drivability Tests
Ko C, Cho D, Chun K
Gerontechnology R&D Group, Korea Institute of Industrial Technology (KITECH)
-
- 82 A Hybrid Model Simulating Hand Gripping on a Cylindrical Handle
Wu J, Dong R, Warren C, Welcome D, McDowell T
National Institute for Occupational Safety and Health (NIOSH)
-
- 84 The Effect of Extended Durations of Walking in Occupational Footwear on Balance
Chander H, Garner J, Wade C
Applied Biomechanics Laboratory, The University of Mississippi
-
- 86 Mimetic Jar Device Capable of Measuring Dynamic Opening Forces: Development and Validation
Ellingson A, Ferkul M, McGee C, Mathiowetz V, Nuckley D
University of Minnesota
-
- 88 Influence of Object Size and Hand Posture on Upper Limb Joint Loads During One-Handed Lifting Exertion
Zhou W, Armstrong T, Wegner D, Reed M
University of Michigan
-
- 90 Cervical and Masticatory Muscles Activity During a 30 Minutes Laptop Typing Task - a Preliminary Study
Barbara D, Edward H, Gadotti I
Florida International University

LOWER EXTREMITY

ODD NUMBERS PRESENT 5:00 - 6:30

EVEN NUMBERS PRESENT 3:30 - 5:00

- 91 A Potential Role of Eversion in Limiting Medial and High Ankle Sprains: A Parametric Study

Wei F, Haut R

Kessler Foundation Research Center

- 93 Validation of an Electrogoniometry System As a Measure of Knee Kinematics During Activities of Daily Living

Urwin S, Kader D, Caplan N, St Clair Gibson A, Stewart S

Northumbria University

- 95 Comparison of Hip Morphology in Femoroacetabular Impingement and Normal Patients

Weaver A, Rucker L, Urban J, Theivendran K, Stitzel J

Virginia Tech-Wake Forest University Center for Injury Biomechanics

- 97 Effects of Regional Foot Pain on Plantar Pressure and Loading

Riskowski J, Dufour A, Hagedorn T, Casey V, Hannan M

Institute for Aging Research / Harvard Medical School

- 99 The Effects of Leg Dominance, Neuromuscular Training, and Fatigue on Bilateral Lower Extremity Kinematics

Greska E, Cortes N, Ringleb S, Samaan M, Van Lunen B

Old Dominion University

- 101 Knee Kinematics During Sloped Walking and Running in Healthy Women with Knee Hyperextension

Teran-Yengle P, Bissig K, Paige A, Rogers A, Yack H

University of Iowa

- 92 Varying Foam Surface Thickness Does Not Affect Landing EMG Pre-Activation in Active Females

Lippa N, Krzeminski D, Goetz J, Piland S, Rawlins J, Gould T

University of Southern Mississippi

- 94 Muscle Activity Patterns of Lower Limb During Lateral (Frontal) Side Stepping Task Modulation from Different Heights

Bhatia D, Novo M, Munoz M, Bejarano T, Jung R, Brunt D

Adaptive Neural Systems Lab, Department of Biomedical Engineering, Florida International University, Miami

- 96 Effect of the Foot Toe-Out Angle on the Knee Adduction Moment During Walking and Running

Alcantara C, Castanharo R, Duarte M

Universidade de Sao Paulo

- 98 Effects of Volitional Preemptive Abdominal Contraction on Trunk and Lower Extremity Biomechanics and Neuromuscular Control During a Drop Vertical Jump

Haddas R, Hooper T, Sizer P, James R

Texas Tech University Health Sciences Center

- 100 Influence of Eccentric Body Weight on the Knee Balance of Obese Patients

Li J, MacMahon E, Theiss M

Inova Fairfax Hospital

- 102 The Influence of Prophylactic Ankle Braces on Lower Limb Mechanics During Single-Leg Hopping Tasks

Anderson A, Boros R, Stodden D, Yang H

Texas Tech University

BALLROOM A

FALLS

ODD NUMBERS PRESENT 5:00 - 6:30

EVEN NUMBERS PRESENT 3:30 - 5:00

103 Age-Related Redistribution of Hip and Knee Kinetics During Out-And-Back Stepping
Schulz B
VA HSR&D/RR&D Center of Excellence, Maximizing Rehabilitation Outcomes

105 Age-Related Differences in the Stepping Response to Laterally-Directed Disturbances
Hurt C, Grabiner M
University of Illinois at Chicago

107 Fall Detecting Using Inertial and Electromyographic Sensors
Yang B, Liao S
National Chiao Tung University

109 Strength, Power and Electromyographic Performance of Hip Musculature in Older Female Fallers and Non-Fallers
Zamfolini Hallal C, Morcelli M, Fernandes Crozara L, Ribeiro Marques N, Martineli Rossi D, LaRoche D, Goncalves M, Navega M
Sao Paulo State University

111 Common Head Acceleration Exposures in the Early Pediatric Population
Desautels D, Serina E
Talas Engineering, Inc.

113 Which Muscles Limit the Ability of Older Adults to Recover Balance?
Kadono N, Pavol M
University of Ottawa

104 Altered Movement Strategy During Sit-To-Walk in Elderly Adults with History of Falling
Chen T, Chou L
University of Oregon

106 Knee Joint Loading During a Compensatory Step: Preliminary Data for Observing Recovery Responses in Knee Osteoarthritic Patients
Hoops M, Rosenblatt N, Skoirchet A, Grabiner M
University of Illinois at Chicago

108 Association Between Strength, Kinematics, and the Energy Cost of Walking in Older, Female Fallers and Non-Fallers
Marques N, Hallal C, LaRoche D, Crozara L, Morcelli M, Karuka A, Navega M, Goncalves M
Sao Paulo State University

110 The Effects of Fatigue on Recovery from a Postural Perturbation
McClain M, Dickin C, Wang H
Ball State University

112 Investigating the Link Between Kinematic Deviations and Recovery Response to Unexpected Slips
Hur P, Beschorner K
University of Wisconsin-Milwaukee

POSTURE & BALANCE

ODD NUMBERS PRESENT 5:00 - 6:30

EVEN NUMBERS PRESENT 3:30 - 5:00

115 The Effect of Vibrotactile Stimulation on Long Range Correlation of Stride Interval Time Series Among Different Walking Speeds
Chien J, Huang C, Vallabhajosula S, Mukherjee M, Siu K, Stergiou N
Nebraska Biomechanics Core Facility, University of Nebraska at Omaha

117 Using Stationary and Non-Stationary Measures of Balance to Assess Handstand Performance
Blenkinsop G, Pain M, Hiley M
Loughborough University

119 Individuals with Diminished Hip Abductor Muscle Strength Exhibit Higher Moments & Neuromuscular Activation at the Ankle During Unipedal Balance Tasks
Lee S, Powers C
University of Southern California

121 Margin of Stability As a Metric for Balance Impairment in Multiple Sclerosis
Cutler E, Wurdeman S, McGrath D, Myers S, Stergiou N, Huisinga J
University of Nebraska at Omaha

123 Stabilogram Diffusion Analysis Applied to Dynamic Stability: One-Legged Landing from a Short Hop
Heise G, Smith J, Liu K
University of Northern Colorado

125 The Use of a Platform for Dynamic Simulation of Movement: Application to Balance Recovery
Mansouri M, Clark A, Reinbolt J
University of Tennessee

127 The Effect of Different Foams on Posturography Measures in Healthy and Impaired Populations
Petit D, Bigelow K
University of Dayton

114 Stability Radius As a Method for Comparing the Dynamics of Neuromechanical Systems
Bingham J, Ting L
Georgia Institute of Technology

116 Lingering Impairments in Postural Control, Despite Symptom Resolution, Following a Concussion.
Buckley T, Tapia-Lovler T, Munkasy B
Georgia Southern University

118 Response to Medio-Lateral Perturbations of Human Walking and Running
Qiao M, Hughes M, Jindrich D
Arizona State University

120 Validation and Calibration of the Wii Balance Board As an Inexpensive Force Plate
Bartlett H, Bingham J, Ting L
Georgia Institute of Technology

122 Children with Cerebral Palsy May Not Benefit from Stochastic Vibration When Developing Independent Sitting
Yu Y, Vallabhajosula S, Haworth J, Stergiou N, Harbourne R
Nebraska Biomechanics Core Facility, University of Nebraska at Omaha

124 Postural Sway Changes in Altered Sensory Environments Following Individualized Whole Body Vibration
Dickin D, Hubble R, Heath J, Beltran E, Haggerty M
Biomechanics Laboratory - Ball State University

126 Effect of Obesity and Overweight on Postural Balance in Children from 7 to 14-Years-Old
de David A, Barbacena M
University of Brasilia

BALLROOM A

POSTURE & BALANCE (CONTINUED)

ODD NUMBERS PRESENT 5:00 - 6:30

- 129 The Relationship Between Structural and Spatial Variability of Postural Control in Persons with Parkinson Disease
Amano S, Stegemöller E, Altmann L, Hass C
University of Florida
-
- 131 Effects of Multifocal Lens Glasses on Stepping Accuracy During Step Down
Beschorner K, Dyapa S, Moore C, Tomashek D, Keenan K
University of Wisconsin-Milwaukee
-
- 133 The Effect of Age and Movement Direction on Rapid and Targeted Center of Pressure Submovements while Crouching
Hernandez M, Ashton-Miller J, Alexander N
University of Michigan

EVEN NUMBERS PRESENT 3:30 - 5:00

- 128 The Influence of Repetitive Loads on Foot Sensitivity and Dynamic Balance
Hamilton S, Raisbeck L, Roemer K
Michigan Technological University
-
- 130 Impact of Dual-Tasking on Lower Joint Dynamics During Stair Ascension
Davidson A, Vallabhajosula S, Tan C, Mukherjee M, Siu K, Yentes J, McGrath D, Myers S
Nebraska Biomechanics Core Facility, University of Nebraska at Omaha
-
- 132 Postural Control Model of Spasticity in Persons with Multiple Sclerosis
Boes M, Hsiao-Weckler E, Motl R, Sosnoff J
University of Illinois at Urbana-Champaign

CLINICAL

ODD NUMBERS PRESENT 5:00 - 6:30

- 135 The Gait Pattern of Children with Cerebral Palsy Has Greater Stochastic Features
Kurz M, Harbourne R
University of Nebraska Medical Center
-
- 137 Dual-Task Walking and Computerized Cognitive Tests in Assessing Concussed High School Athletes
Howell D, Osternig L, Chou L
University of Oregon
-
- 139 Emotion As a Gait Therapy in Parkinson's Patients: Affective Stimuli & Gait Pattern Variability
Beatty G, Roemmich R, Naugle K, Janelle C, Hass C
University of Florida
-
- 141 The Impact of Obesity on the Accuracy of Predicting Body Fat Percentage in Older Men
Parise E, Chambers A, McCrory J, Cham R
University of Pittsburgh

EVEN NUMBERS PRESENT 3:30 - 5:00

- 134 Children with Cerebral Palsy Do More Positive Mechanical Work After Gait Rehabilitation
Kurz M, Stuberger W, Arpin D, Gosselin M
University of Nebraska Medical Center
-
- 136 The Gait Variability Profile of Patients with Parkinson's Disease When Compared to Older Adults with Mobility Disability and a History of Falls.
Nocera J, Okun M, Skinner J, Hass C
Department of Veterans Affairs
-
- 138 Effect of L-Dopa on Multi-Finger Synergies and Anticipatory Synergy Adjustments in Parkinson's Disease
Park J, Zatsiorsky V, Lewis M, Huang X, Latash M
Pennsylvania State University, University Park
-
- 140 Gait Compensations in a Rat Medial Meniscus Transection Model of Knee Osteoarthritis
Allen K, Mata B, Gabr M, Huebner J, Kraus V, Setton L
University of Florida

POSTER SESSION 1 | THURSDAY, 3:30 - 6:30

BALLROOM A

CLINICAL (CONTINUED)

ODD NUMBERS PRESENT 5:00 - 6:30

EVEN NUMBERS PRESENT 3:30 - 5:00

- 143 Distinct Features of Grip Force Characterize Parkinson's Disease and Atypical Parkinsonian Disorders
Neely K, Planetta P, Prodoehl J, Corcos D, Comella C, Goetz C, Shannon K, Vaillancourt D
University of Florida
-
- 145 Changes in Muscle Co-Activation in Spinal Cord Injured Individuals After Body-Weight Supported Treadmill Training
Lee S, Pahl K, Lam T, Wakeling J
Simon Fraser University
-
- 147 Computerized Gait Analysis and Lumbar Range of Motion Assessments in People with Lumbar Spinal Stenosis
Conrad B, Abbasi A, Vincent H, Seay A, Kennedy D
University of Florida
-
- 149 Using MRI-Based Muscle Volumes and Gait Analysis to Quantify Relative Muscle Effort in Children with Cerebral Palsy
Russell S, Handsfield G, Boyle M, Sauer L, Meyer C, Abel M, Blemker S
University of Virginia
-
- 151 Frequency Domain Analysis of Ground Reaction Force Does Not Differentiate Between Hyperkinetic and Hypokinetic Movement Disorders.
Skinner J, Roemmich R, Amano S, Stegemöller E, Altmann L, Hass C
University of Florida
-
- 153 The Effect of Anesthetic Hip Joint Injections on Gait
Kennedy D, Sun D, Vincent H, Seay A, Abbasi A, Conrad B
University of Florida
-
- 155 Altered Hip Movement in Females with Hip Pain During Single Leg Step Down
Lewis C
Boston University

- 142 The Influence of Merged Muscle Excitation Modules on Post-Stroke Hemiparetic Walking Performance
Allen J, Kautz S, Neptune R
The University of Texas at Austin
-
- 144 Differences in Repetitive Finger Movement Between the Most Effected and Least Effected Hand in Parkinson's Disease
Stegemöller E, MacKinnon C, Tillman M, Hass C
University of Florida
-
- 146 Walking Abnormalities in Patients with COPD
Yentes J, Rennard S, Stergiou N
Nebraska Biomechanics Core Facility
-
- 148 Spatiotemporal Gait Asymmetry is Related to Balance/Fall Risk in Individuals with Chronic Stroke
Bradley C, Wutzke C, Zinder S, Lewek M
University of North Carolina at Chapel Hill
-
- 150 The Relationship Between Lower Extremity Joint Power During Sit to Stand and Clinical Measures of Function Among Subjects Post Hip Fracture
Kneiss J, Houck J, Hilton T
MGH Institute of Health Professions
-
- 152 Patients with Peripheral Arterial Disease Exhibit Greater Toe Clearance than Healthy Controls
Rand T, Wurdeman S, Johannig J, Pipinos I, Myers S
Nebraska Biomechanics Core Facility
-
- 154 Pelvic Excursion During Walking Post-Stroke
Little V, McGuirk T, Perry L, Patten C
University of Florida
-
- 156 Mechanical Cueing Using a Portable Powered Ankle-Foot Orthosis
Petrucci M, MacKinnon C, Hsiao-Wecksler E
University of Illinois at Urbana-Champaign

POSTER SESSION 1 | THURSDAY, 3:30 - 6:30

BALLROOM A

REHABILITATION

ODD NUMBERS PRESENT 5:00 - 6:30

- 157 Biomechanical Analysis of Discrete Versus Cyclic Reaching in Survivors of Stroke
Massie C, Malcolm M, Greene D, Browning R
Colorado State University
-
- 159 Partnered Human-Robot Stepping Based on Interactive Forces at the Hand
Chen T, McKay J, Bhattacharjee T, Hackney M, Kemp C, Ting L
Georgia Institute of Technology
-
- 161 The Effect of Kinesio Taping on Kinematics and Muscle Activity for Subjects with Neck Pain
Lee S, Chen G, Chou M, Su F
Department of Biomedical Engineering, National Cheng Kung University
-
- 163 A Novel Elastic Loading-Based Exercise Program Improves Both Strength and Power at the Ankle Joint
Carey J, Rand T, Myers S
University of Nebraska at Omaha
-
- 165 Kinematic Analysis of Gesture in Aphasia
Osmanzada H, Ringleb S, Samaan M, Raymer A
Old Dominion University
-
- 167 Priming the Motor System: Passive and Active Movements Induce Distinct Gabaergic Effects
Guri A, Corti M, Patten C
University of Florida

EVEN NUMBERS PRESENT 3:30 - 5:00

- 158 Preliminary Study of Changes in Trunk Forward Bend Aberrant Patterns Post Core Stabilization Intervention
Wattananon P, Biely S, Sung W, Cannella M, Silfies S
Drexel University
-
- 160 Gender Effects on Lower Extremity Biomechanics in Adolescent Patients Following ACL Reconstruction
Dai B, Butler R, Garrett W, Queen R
Duke University
-
- 162 Objective Evaluation of Chronic Ankle Instability and Balance Exercise Treatment
Jain T, Wauneka C, Liu W
University of Kansas Medical Center
-
- 164 Sit to Stand Mechanics After Symmetry Training for Patients After Total Knee Arthroplasty
Abujaber S, Zeni J, Snyder-Mackler L
University of Delaware
-
- 166 Scapular and Clavicular Kinematics During Empty and Full Can Exercises in Subjects with Subacromial Impingement Syndrome
Timmons M, Grover M, Lopes-Albers A, Ericksen J, Michener L
Department of Veterans Affairs-Hunter Holmes McGuire VA Medical Center
-
- 168 Power Training Post-Stroke Engages Neural Circuits at Spinal and Supraspinal Levels
Corti M, Patten C
University of Florida

WHEELCHAIR BIOMECHANICS

ODD NUMBERS PRESENT 5:00 - 6:30

- 169 A Reanalysis of Wrist Jerk During Ergonomic Hand Drive Wheelchair Propulsion
Zukowski L, Roper J, Otzel D, Hovis P, Shechtman O, Tillman M
University of Florida
-
- 171 Correlation Analysis of Upper Extremity Kinematics for Manual Wheelchair Propulsion
Jayaraman C, Hsu I, Moon Y, Hsiao-Weckler E, Rice I, Beck C, Sosnoff J
University of Illinois Urbana Champaign

EVEN NUMBERS PRESENT 3:30 - 5:00

- 170 The Effect of Crank Position and Backrest Inclination on Shoulder Load During Handcycling
Arnet U, van Drongelen S, Schlusser M, Lay V, van der Woude L, Veeger D
Swiss Paraplegic Research
-
- 172 Pain During Ergonomic Hand Drive Wheelchair Propulsion
Hovis P, Zukowski L, Roper J, Otzel D, Shechtman O, Bishop M, Tillman M
University of Florida

POSTER SESSION 2 | FRIDAY, 8:00 - 11:00 AM

AZALEA (FRIDAY THEMATIC POSTERS)

GAIT

ODD NUMBERS PRESENT 9:30 - 11:00

A1 Decreased Gait Transition Speeds in Unilateral, Transtibial Amputee Gait
Norman T, Chang Y
Georgia Institute of Technology

A3 Comparison of Kinematic, Kinetic, and Mechanical Work Data Between Traditional and Bone Bridge Amputation Techniques During Fast Walking One Year Post Ambulation Without an Assistive Device
Kingsbury T, Thesing N, Collins J, Carney J, Wyatt M
Naval Medical Center, San Diego, CA

A5 Net Efficiency of the Combined Ankle-Foot System in Normal Gait: Insights for Passive and Active Prosthetics
Takahashi K, Stanhope S
University of Delaware

EVEN NUMBERS PRESENT 8:00 - 9:30

A2 Both Limbs in Unilateral Transtibial Amputees Display Increased Risk for Tripping
Wurdeman S, Yentes J, Myers S, Jacobsen A, Stergiou N
Nebraska Biomechanics Core Facility

A4 Upper Body Kinematics of Bilateral Transtibial Prosthesis Users During Gait
Major M, Stine R, Hodgson M, Gard S
Northwestern University Prosthetics-Orthotics Center

A6 Ground Reaction Force and Temporal-Spatial Adaptations to Running Velocity When Wearing Running-Specific Prostheses
Baum B, Tian A, Schultz M, Hobara H, Linberg A, Wolf E, Shim J
University of Maryland, College Park

COMPUTATIONAL BIOMECHANICS

ODD NUMBERS PRESENT 9:30 - 11:00

C1 Muscle Force Estimates During the Weight-Acceptance Phase of Single-Leg Jump Landing
Morgan K, Donnelly C, Reinbolt J
University of Tennessee

C3 Comparison of Patella Bone Stress Between Individuals with and Without Patellofemoral Pain
Ho K, Powers C
University of Southern

C5 An Adaptive Tabu Search Optimization Algorithm for Generating Forward Dynamics Simulations of Human Movement
Vistamehr A, Neptune R
Mechanical Engineering Department, The University of Texas, Austin

EVEN NUMBERS PRESENT 8:00 - 9:30

C2 Peak and Nonuniform Fiber Stretch Increase in the Biceps Femoris Long Head Muscle at Faster Sprinting Speeds
Fiorentino N, Chumanov E, Thelen D, Blemker S
University of Virginia

C4 The Influence of Increased DOF in the Knee Joint on Muscle Activation Timings and Forces in a Musculoskeletal Model
Roos P, Jonkers I, Button K, van Deursen R
Cardiff University

DOGWOOD

COMPARATIVE

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

173 A Laboratory Method for Evaluating Dynamic Properties of Equine Racetrack Surfaces
Setterbo J, Chau T, Fyhrie P, Hubbard M, Upadhyaya S, Stover S
University of California, Davis

174 Breezing Racehorse Limb Kinematics on Different Race Surface Materials
Symons J, Garcia-Nolen T, Stover S
UCDavis

175 Hindwing Function in Four-Winged Feathered Dinosaurs
Hall J, Habib M, Hone D, Chiappe L
Natural History Museum of Los Angeles County/University of Southern California

KNEE

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

177 Real-Time Biofeedback for ACL Injury Prevention
Ford K, DiCesare C, Myer G, Hewett T
Cincinnati Children's Hospital

176 Hop Performance in Individuals with Anterior Cruciate Ligament Injuries
Roos P, Button K, van Deursen R
Cardiff University

179 The Influence of Upper Body Stability on Peak Knee Loading During Sidestepping: Implications for Athlete Screening and ACL Injury Risk
Edmonds D, Lloyd D, Donnelly C
The University of Western Australia

178 The Correlation Between Internal Skeletal Dimensions of Tibiofemoral Joint and External Body Measurements
Zou D, Deusinger R, Koleini M, Smith K, Hensley G, Machan T, Vasiljevic D
Washington University School of Medicine

181 Predicting in Vitro Articular Cartilage Wear in the Patellofemoral Joint Using Finite Element Modeling
Li L, Patil S, Steklov N, Bae W, D'Lima D, Sah R, Fregly B
Department of Mechanical and Aerospace Engineering, University of Florida

180 Estimating ACL Force from Lower Extremity Kinematics and Kinetics
Dai B, Yu B
The University of North Carolina at Chapel Hill

183 Tibiofemoral Joint Articular Surface Motion Gender Differences in Subject Specific and Generic Knee Models
Deusinger R, Zou D, Koleini M, Smith K, Hensley G, Machan T
Washington University School of Medicine

182 A Novel Impaction System to Model Cartilage Injury in Living Rabbit Knees
Diestelmeier B, Tochigi Y, Rudert M, Fredericks D, Arunakul M, Brown T, McKinley T
University of Iowa

185 Correlation Between KT Arthrometer Data and ACL Strain Suggests Diagnostic Importance
Kiapour A, Quatman C, Wordeman S, Levine J, Ditto R, Paterno M, Goel V, Demetropoulos C, Hewett T
University of Toledo

184 Latent Profile Analysis: Grouping Subjects by Biomechanical Predictors of Increased Kam & Potential Risk for ACL Injury
Hewett T, Ford K, Xu Y, Khoury J, Myer G
The Ohio State University, Cincinnati Children's Hospital Research Foundation

KNEE (CONTINUED)

ODD NUMBERS PRESENT 9:30 - 11:00

- 187 Single Leg Hop Landing Biomechanics and Association with Symmetry Index Following Meniscectomy

Hsieh C, Chmielewski T

University of Florida

- 189 Tibial Slope and Knee Flexion Moderate Muscle Induced Strain in the Anterior Cruciate Ligament

Breighner R, Domire Z, Slauterbeck J, Hashemi J

Texas Tech University

- 191 Tibiofemoral Cartilage Thickness Following ACL Reconstruction

Thorhauer E, Tashman S

University of Pittsburgh

EVEN NUMBERS PRESENT 8:00 - 9:30

- 186 The Effect of Unilateral and Total Meniscectomy on Posterior Cruciate Ligament Forces Under Femoral Anterior Drawer in Passive Human Knee at Full Extension.

El Sagheir S, Moglo K

Royal Military College of Canada

- 188 Knee Kinematics and Kinetics During Descent of a Navy Ship Ladder

Coulter J, Bawab S, Weinhandl J, Ringleb S

Old Dominion University

- 190 Effect of Enhanced Eccentric Resistance During the Squat Exercise on Lower Extremity Stability and Strength

Conrad B, David H, Barone T, Tang S, MacMillan M

University of Florida

- 192 Influence of Sex and Severity on the External Adduction Moment in Medial Compartment Knee Osteoarthritis

Morrow M, Kaufman K

Mayo Clinic

SPINE

ODD NUMBERS PRESENT 9:30 - 11:00

- 193 In Vivo Three-Dimensional Analysis of the Thoracic Spine in Trunk Rotation

Fujimori T, Iwasaki M, Ishii T, Kashii M, Murase T, Sugamoto K, Yoshikawa H

Department of Orthopedic Surgery, Osaka University Graduate School of Medicine

- 195 Quantification of Multi-Segmental Spine Movement During Gait

Breloff S, Chou L

University of Oregon

- 197 Biomechanical Loading of the Sacrum in Pre- and Post Operative Adolescents Idiopathic Scoliosis

Pasha S, Aubin C, Parent S, Labelle H, Mac-Thiong J

Ecole polytechnique de Montreal

EVEN NUMBERS PRESENT 8:00 - 9:30

- 194 The Effect of Thoracic Kyphosis and Sagittal Plane Alignment on Vertebral Compressive Loading

Bruno A, Anderson D, D'Agostino J, Bouxsein M

Harvard-MIT Health Sciences and Technology Program

- 196 Disturbances to Intrinsic Stiffness and Reflexive Muscle Responses Following Repeated Static Trunk Flexion

Muslim K, Hendershot B, Toosizadeh N, Nussbaum M, Bazrgari B, Madigan M

Virginia Tech

- 198 Loading Rate During Spinal Manipulation Has Minimal Effect on Lumbar Spine Peak Reaction Force and Spinal Stiffness: A Human Specimen Study

Xia T, Gudavalli R, Qin Y, Goel V, Ianuzzi-Morris A, Pickar J

Palmer College of Chiropractic

DOGWOOD

SPINE (CONTINUED)

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

199 Creating Physiologically Realistic Vertebral Fractures
Corbiere N, Lewicki K, Ferrucci L, Issen K, Kuxhaus L
Clarkson University

200 Analysis of the Biomechanical Characteristics of the Spinal Interspinous Implants
Choi D, Kim Y, Kim K
University of Kyung Hee

201 Anticipatory Activation of the Erector Spinae and Multifidus in Patients with and Without Low Back Pain
Currie S, Myers C, Davidson B, Enebo B
University of Denver

202 Impact of the Loading Type on the Biomechanics of the Cervical Spine
Mesfar W, Moglo K
Royal Military College of Canada

HICKORY

UPPER EXTREMITY

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

203 Musculoskeletal Loading of the Thumb During Pipette Operation
Wu J, Sinsel E, Shroyer J, Warren C, Welcome D, Zhao K, An K, Buczek F
National Institute for Occupational Safety and Health (NIOSH)

204 Calculating Thumb and Index Finger Postures During Pinch with a Minimal Marker Set
Nataraj R, Li Z
Cleveland Clinic

205 Contact Stress Analysis of the Radial Head and the Radial Head Implants
Kim S, Miller M
University of Pittsburgh

206 Removal of Pain from Patients with Shoulder Impingement Results in Alterations in Shoulder Muscle Activity & Scapular Kinematics
Ettinger L, Shapiro M, Karduna A
University of Oregon

207 Handgrip Force and Upper-Limb Kinetics During Handcycling
Griswold J, Sasaki K
Boise State University

208 The Effect of Arm Position on Hill-Sachs Engagement: A Finite Element Study
Walia P, Miniaci A, Jones M, Fening S
Cleveland State University; Cleveland Clinic

209 The Effect of Arm Position on Bony Bankart Lesion: A Finite Element Study
Walia P, Miniaci A, Jones M, Fening S
Cleveland State University; Cleveland Clinic

210 Assessment of Functional Reaching Tasks in Older Adults
Vidt M, Daly M, Marsh A
Wake Forest School of Medicine, Department of Biomedical Engineering

211 Effects of Cortical Stimulation on Sensorimotor Functions of the Hand in Healthy Old Adults
Parikh P, Cole K
University of Iowa

212 The Effects of Upper Extremity Lymphedema on Dominant Limb 3-Dimensional Scapular Kinematics and Upper Extremity Function in Survivors of Breast Cancer
Biggers L, Rundquist P
Krannert School of Physical Therapy

POSTER SESSION 2 | FRIDAY, 8:00 - 11:00 AM

HICKORY

UPPER EXTREMITY (CONTINUED)

ODD NUMBERS PRESENT 9:30 - 11:00

213 Development and Verification of an Elbow Stiffness Tester
Zeng S, Robinson C, Kuxhaus L
Clarkson University

215 Electromyographic and Kinematic Analysis of Medial Reverse Shoulder Arthroplasties During Functional Motions
Walker D, Struk A, Wright T, Banks S
University of Florida

217 Characterization of Coupled Wrist and Forearm Stiffness
Drake W, Charles S
Brigham Young University

219 Reliability and Precision of the Resistance Zone and Laxity Zone for Shoulder Internal and External Rotation
Livingston B, Wight J, Wikstrom E, Tillman M
University of North Florida

EVEN NUMBERS PRESENT 8:00 - 9:30

214 The Medial Ulnar Collateral Ligament Carries No Load During Passive Flexion and Extension
Muiuki M, Schimoler P, Campbell B, Vaccariello M, Snell E, Akhavan S, DeMeo P, Miller M
Allegheny General Hospital

216 Altered Scapulohumeral Coordination in Individuals with Scapular Dyskinesia
Spinelli B, Ebaugh D
Drexel University

218 Kinematic Coupling of Wrist and Forearm Movements
Anderton W, Charles S
Brigham Young University

220 Effects of Serratus Anterior Muscle Fatigue on Scapular Kinematics
Costantini O, Dashottar A, Borstad J
The Ohio State University

BALLROOM A

RUNNING

ODD NUMBERS PRESENT 9:30 - 11:00

221 Mechanical Demand Distribution During Shod and Novice Barefoot Running
Hashish R, Samarawickrame S, Gaur K, Salem G
University of Southern California

223 Plantar Pressure Differences Between Rearfoot and Midfoot Striking Runners
Becker J, Howey R, Osternig L, James S, Chou L
University of Oregon

225 Age Related Changes in Running
Freedman Silvernail J, Rohr E, Brueggemann G, Hamill J
University of Massachusetts

EVEN NUMBERS PRESENT 8:00 - 9:30

222 Biomechanics of Retrospective Navicular Stress Fractures
Becker J, Osternig L, James S, Chou L
University of Oregon

224 Static Foot Structure and Knee Kinematics During Running
DiCesare C, Taylor-Haas J, Hickey K, Myer G, Hegedus E, Ford K
Cincinnati Children's Hospital

226 Trunk Flexion Angle is Associated with Patellofemoral Joint Stress During Overground Running
Teng H, Powers C
University of Southern California

BALLROOM A

RUNNING (CONTINUED)

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

227 Predictors of Initial Impact Load and Loading Rates in Runners
Noehren B, Pohl M
University of Kentucky

229 Changing Step Width Alters Lower Extremity Kinematics During Running
Milner C, Brindle R, Zhang S, Fitzhugh E
University of Tennessee

231 Accuracy of Self-Reported Footstrike Patterns and Loading Rates Associated with Traditional and Minimalist Running Shoes
Goss D, Lewek M, Yu B, Gross M
University of North Carolina at Chapel Hill

233 Trunk Endurance Strength and Running Biomechanics After Iliotibial Band Syndrome
Foch E, Pfeiffer J, Milner C
University of Tennessee

235 Medial Longitudinal Arch Characteristics During Running
Forrester S
Loughborough University

237 Average Ankle Dynamic Joint Stiffness During Heel Strike Running
Razzook A, Gleason C, Willy R, Fellin R, Davis I, Stanhope S
University of Delaware

239 Differences in Running and Walking Gait Kinematics During Earth and Simulated Mars and Lunar Gravitational Environments: Preliminary Investigation
Shapiro R, Cunningham T, Wallace B, Norberg J, Phillips M, Miller M
University of Kentucky

241 Exertion Modulates Ankle Joint Co-Activation During Novel Barefoot and Post-Transition Barefoot Running Conditions
Samarawickrame S, Hashish R, Gaur K, Salem G
University of Southern California

228 EMG Activity while Alter-G Treadmill Running
Hunter I, Seeley M, Hopkins T, Franson J, Collins M
Brigham Young University

230 Lower Extremity Joint Moments During the Active Peak Vertical Ground Reaction Force in Three Different Running Conditions
Standifird T, Johnson W, Hunter I, Ridge S
Brigham Young University

232 Ground Reaction Forces During Treadmill Exercise on the International Space Station
De Witt J, Fincke R, Guillems M, Ploutz-Snyder L
Wyle Science, Technology and Engineering Group/NASA JSC

234 Effect of Running Classes on Running Kinematics and Economy
Craighead D, Lehecka N, King D
Ithaca College

236 Computer Simulation Assists Gait Retraining Program, a Case Study
Beltran E, McClain M, Wang H
Ball State University

238 Sagittal Kinematics & Kinetics of Midfoot/Forefoot Running After 4 Weeks of Training
Boyer E, Derrick T
Iowa State University

240 Insights into the Footstrike Patterns of Women Distance Runners
Cavanagh P, Glauberman M, Manner K, Sawyer K, Devasia S
University of Washington

POSTER SESSION 2 | FRIDAY, 8:00 - 11:00 AM

BALLROOM A

SPORTS

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

- 243 The Effect of Load on Movement Coordination During Sled Towing
Lawrence M, Leib D, Masterson C, Hartigan E
University of New England
-
- 245 Biomechanical Analysis of Basketball Free Throw Shooting
Bradley S, Martin J
Penn State
-
- 247 Softball Windmill Pitch: Necessity of a Pitch Count
Postlmayr C, Wu T, Ashley J
Bridgewater State University
-
- 249 Deceleration: Relationship Between Body Position and Velocity
Havens K, Sigward S
University of Southern California
-
- 251 The Influence of Fatigue on Landing Mechanics in Youth Male Lacrosse Athletes
Cortes N, Greska E, Bamberg J, Ringleb S, Van Lunen B
George Mason University
-
- 253 Influence of Various Heights and Surfaces on Neuromuscular Strategies During Drop Landings
Esselman E, Carpenter A, Smith J, Heise G
University of Northern Colorado
-
- 255 Rate of Loading and Lower Extremity Sagittal Plane Biomechanics When Landing from a Drop-Jump: Shod and Barefoot Comparisons Between Genders
Cochrane R, McNeaney B, Lawrence M, Hartigan E
University of New England
-
- 257 Relationships Between Electromyography and Oxygen Consumption in Different Work Loads - Rowing Exercise
Hsu H, Hong W, Wang H
Department of Sports Medicine

- 242 The Effect of Pedal Crank Arm Length on Lower Limb Joint Angles in an Upright Cycling Position
Too D, Williams C
The College at Brockport
-
- 244 The Rotational Stiffness of Football Shoes May Affect the Location of a Potential Ankle Injury
Wei F, Meyer E, Braman J, Powell J, Haut R
Michigan State University
-
- 246 Between Landing Kinetic and Kinematic Differences in a Drop Vertical Jump
Bates N, Ford K, Myer G, Hewett T
University of Cincinnati
-
- 248 Batting Cage Performance of Various Youth Baseball Bats
Crisco J, Rainbow M, Wilcox B, Schwartz J
Department of Orthopaedics, Warren Alpert Medical of Brown University and Rhode Island Hospital
-
- 250 Latissimus Dorsi Anthropometry and Swimming
Weimar W, Campbell B
Auburn University
-
- 252 The Influence of Pedal Platform Height on Maximal Average Crank Power During Pedaling: A Simulation Study
Vistamehr A, Neptune R
Mechanical Engineering Department, The University of Texas, Austin
-
- 254 The Examination of Softball Pitching Fatigability in Lower Extremities.
Ashley J, Wu T, Postlmayr C
Bridgewater State University
-
- 256 Effects of a 6 Week Intervention Program on Lower Limb Joint Moment Asymmetry in Healthy Female Collegiate Athletes
Spencer R, St Jeanos A, Wynot M, Lawrence M, Hartigan E
University of New England

SPORTS (CONTINUED)

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

259 The Effects of Neuromuscular Fatigue on Coordination Variation
Samaan M, Cortes N, Hoch M, Ringleb S, Weinhandl J, Greska E, Lucci S, Quammen D, Bawab S
Old Dominion University

261 Comparison Between Squat Jump vs. Weighted Squat Jump: Simulation Study.
Cimadoro G, Minetti A, Pain M, Van Hoecke J, Alberti G, Babault N, Yeadon M
University of Milan, Department of Sport, Nutrition and Health Science, Milano, ITALY

263 Stride Length Compensations and Their Impacts on Brace-Transfer Ground Forces in Baseball Pitchers
Crotin R, Ramsey D
University at Buffalo

265 Muscle Activation Changes Across Three Different Skate Skiing Techniques.
Mills K, Heil D, Higginson B
Gonzaga University

267 Kinematic Analysis of Volleyball Spiking Maneuver
Dunbar N, Chmielewski T, Tillman S, Zheng N, Conrad B
University of Florida

269 Effects of Long-Term Use of Ankle Taping on Balance
McGregor S, Johnson S, Pavol M
Oregon State University

258 Joint Angles and Joint Moments Following Neuromuscular Fatigue in Futsal Players
Fukuchi R, Fukuchi C, Dinato M, Riani L, Duarte M
University of Calgary

260 A Comparison of Volleyball Blocking Techniques: Jumping Velocities and Effective Blocking Areas
Ficklin T, Schipper M, Lund R
University of Northern Iowa

262 Using Ankle Bracing Influences the Torque Ratio Among Ankle Stabilizers Muscles After Simulation Basketball Match-Play?
Marques N, Castro A, Milanezi F, Almeida A, Crozara L, Goncalves M
Sao Paulo State University

264 The Effects of Whole Body Vibration on the Wingate Test for Anaerobic Power When Applying Individualized Frequencies
Surowiec R, Wang H, Nagelkirk P, Frame J, Dickin D
Ball State University; Steadman Philippon Research Institute

266 A Comparison of Knee Moments During a Lateral Cutting Maneuver: Shod vs. Barefoot
Bisesti B, Cottle C, Lawrence M, Carlson L
University of New England

268 Common Control Strategies for Generating Angular Impulse in Forward and Backward Translating Tasks
Ramos C, Mathiyakom W, McNitt-Gray J
University of Southern California

270 Mechanisms Dancers Use to Maintain Balance and Regulate Reaction Forces When Turning
Zaferiou A, McNitt-Gray J
USC

POSTER SESSION 2 | FRIDAY, 8:00 - 11:00 AM

BALLROOM A

INSTRUMENTATION

ODD NUMBERS PRESENT 9:30 - 11:00

- 271 Comparing Metabolic Costs of Harvesting Biomechanical Energy from Human Motion Versus Carrying Batteries for the Same Energy Supply
Schertzer E, Riemer R
Ben-Gurion University
-
- 273 Estimating Peak Achilles Tendon Forces in Youth During Locomotion Using Hip Acceleration
Neugebauer J, Hawkins D
University of California - Davis
-
- 275 Robust Optical Sensor for Noninvasive Cardiac Monitoring
Sabick M, Johnson J
Boise State University

EVEN NUMBERS PRESENT 8:00 - 9:30

- 272 Posture and Activity Detection Using a Tri-Axial Accelerometer
Lugade V, Fortune E, Morrow M, Kaufman K
Mayo Clinic
-
- 274 Step Counts Using a Tri-Axial Accelerometer During Activity
Fortune E, Lugade V, Morrow M, Kaufman K
Mayo Clinic
-
- 276 Validation of a Commercial Wearable Sensor System for Accurately Measuring Gait on Uneven Terrain
Rigsby M, Edginton Bigelow K
University of Dayton

GAIT

ODD NUMBERS PRESENT 9:30 - 11:00

- 277 Concussion Alters Gait Termination Strategies
Wikstrom E, Tapia-Lovler T, Munkasy B, Buckley T
UNC Charlotte
-
- 279 Muscle Activations in Response to Achilles Tendon Rupture and Repair
Suydam S, Buchanan T, Manal K, Silbernagel K
University of Delaware
-
- 281 Torso Kinematics During Gait Differ Between Pregnant Fallers and Non-Fallers
McCrory J, Chambers A, Daftary A, Redfern M
West Virginia University
-
- 283 Six-Week Gait Retraining Program for Knee Osteoarthritis Patients: Learning Retention and Symptom Changes
Shull P, Silder A, Shultz R, Besier T, Delp S, Cutkosky M
Stanford University

EVEN NUMBERS PRESENT 8:00 - 9:30

- 278 Why Do Humans Walk the Way We Do? Evidence from Dynamic Simulations
Miller R
Queen's University
-
- 280 Metabolic Cost and Lower Extremity Muscle Activity During Constant Speed Walking at Different Stride Frequencies
Boynnton A, Royer T
U.S. Army Research Laboratory/University of Delaware
-
- 282 Frontal Plane Mechanics Are Altered During Split Belt Treadmill Walking in Young Healthy Adults
Roper J, Roemmich R, Tillman M, Hass C
University of Florida
-
- 284 The Metabolic and Mechanical Costs of Step-Time Asymmetry in Walking
Ellis R, Howard K, Kram R
University of Colorado at Boulder

BALLROOM A

GAIT (CONTINUED)

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

285 Comparisons of Flip-Flop, Sandal, Barefoot and Running Shoe in Walking
Zhang S, Zhang X, Paquette M
The University of Tennessee, Knoxville

287 Maximal Dynamic Stability of Walking Coincides with the Freely Adopted Speed and Stride Frequency
Russell D, Haworth J, Martinez-Garza C
Old Dominion University

289 Differences in Stride Interval Variability During Stair-Climbing and Treadmill Walking
Renz J, Vallabhajosula S, Hunt N, Chien J, Stergiou N
Nebraska Biomechanics Core Facility, University of Nebraska at Omaha, Omaha, NE

291 Spatiotemporal Parameters of Uphill, Level and Downhill Walking Are Similar Between Treadmill and Overground Surfaces
Fellin R, Seay J, Gregorczyk K, Hasselquist L
US Army Research Institute of Environmental Medicine

293 Influence of Stepping Rate on Stride Interval Variability of Stair-Climbing
Vallabhajosula S, Renz J, Chien J, Hunt N, Stergiou N
Nebraska Biomechanics Core Facility, University of Nebraska at Omaha, Omaha, NE

295 The Effect of Varying Cadences on Shod & Barefoot Gait Kinematics
Romer B, Fox J, Patel J, Rehm J, Weimar W
Auburn University

297 Comparison of First and Second Generation Rocker Bottom Shoes
Gardner J, Zhang S, Paquette M, Milner C, Foch E
University of Tennessee

299 A Gender Comparison of Lower Extremity Ambulatory Mechanics in Healthy Subjects with Excessive Varus Alignment
Barrios J, Bare D
University of Dayton

286 Maintaining a Constant Margin of Stability Across Dynamic Conditions May Rely on Different Control Strategies
Rosenblatt N, Hurt C, Grabiner M
University of Illinois at Chicago

288 Metabolic Cost of Maintaining Balance During a Perturbed Gait Task is Related to Gait Variability
McGrath D, Wurdeman S, Yentes J, Hunt N, Myers S, Stergiou N
Nebraska Biomechanics Core Facility

290 Lower Limb Muscle Coactivation in Younger and Older Adults During Dual-Task Gait
Hallal C, Ribeiro Marques N, Hebling Spinoso D, Brunt D, Vieira E, Goncalves M
Sao Paulo State University

292 Physiological Cost of Heavy Load Carriage
Bartlett J, Robusto K
Naval Health Research Center

294 The Effect of Knee Pain and Effusion on Vertical Ground Reaction Force During Walking
Seeley M, Park J, Hunter I, Francom D, Black B, Hopkins J
Brigham Young University

296 Altered Kinematics Between Flat and Curved Treadmills Do Not Cause Increased Energy Expenditure
Korgan W, Wurdeman S
University of Nebraska at Omaha

298 The Relationship Between Ambulatory Activity Patterns and Kinematic Variability
Hasenkamp R, Wurdeman S, Myers S
University of Nebraska at Omaha

POSTER SESSION 2 | FRIDAY, 8:00 - 11:00 AM
BALLROOM A

GAIT (CONTINUED)

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

301 Comparison of Tibial Torsion Measurements Using Motion Capture, Physical Therapy Evaluation, and Computed Tomography
Nguyen C, Mueske N, Wren T
University of Southern California

303 Adaptation of Plantarflexor Muscle Activity During Gait
Bunchman A, Wellinghoff M, Dean J
Medical University of South Carolina

305 Limb Force Variance is Structured to Stabilize the Step-To-Step Transitions of Dynamic Walking
Toney M, Chang Y
Georgia Institute of Technology

307 Gender Comparison of Trunk and Pelvis Kinematics During Walking and Running
Westlake C, Noehren B
University of Kentucky

309 Influence of Tai Chi on Kinematics During Multi-Directional Gait Initiation
Vallabhajosula S, Roberts B, Hass C
University of Nebraska at Omaha, Omaha, NE

311 Effects of a Biomechanical Energy Harvesting Ankle Device on Gait Kinetics
Gregory R, Zifchock R, Manuel S, Brechue W
U.S. Military Academy

313 Evaluation and Classification of Load Accomodation Strategies During Walking with Extremity-Carried Weights: A Pilot Study
Atkins L, Dufek J, James R
Texas Tech University Health Science Center

300 Effect of Ankle Load on Gait Patterns During Treadmill Walking
Wu J, Ajisafe T
Georgia State University

302 Walking Speed Overground and on a Feedback-Controlled Treadmill
Collins J, Sessoms P, Bartlett J
Naval Health Research Center

304 Natural Gait May Not Be Neutral: It All Depends on How You Feel
Kang G, Gross M
University of Michigan, Ann Arbor

306 Gait Initiation Impairments in Essential Tremor and Parkinson's Disease
Fernandez K, Roemmich R, Stegemöller E, Nocera J, Hass C
University of Florida

308 Identifying Fallers and Non-Fallers Using Gait Variability Indicators Based on Methods Proposed for Heart Rate Assessment
Zamfolini Hallal C, Ribeiro Marques N, LaRoche D, Ramos Vieira E, Hebling Spinoso D, Fernandes Crozara L, Morcelli M, Goncalves M
Sao Paulo State University

310 Slow Uphill Walking: Better for the Knees of Obese Adults?
Haight D, Reynolds M, Board W, Connor T, Browning R
Colorado State University

312 Induced Alterations of Interlimb Coordination Caused by the Use of a Split-Belt Treadmill
Elrod J, Hoover B, Roemmich R, Hass C
Department of Applied Physiology & Kinesiology, University of Florida

BALLROOM A

PROSTHETICS & ORTHOTICS

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

315 The Influence of Wedged Insoles on Knee and Ankle Moments and Angular Impulses During Walking.
Fukuchi C, Lewinson R, Worobets J, Stefanyshyn D
University of Calgary

317 Comparing Visual Perturbation Responsiveness in Individuals with and Without Trans-Tibial Amputation
Terry K, Faust K, Wilken J, Dingwell J
University of Texas at Austin

319 A Passive Elastic Exoskeleton Reduces the Metabolic Cost of Walking Using Controlled Energy Storage and Release
Wiggin B, Sawicki G
Joint Dept. of Biomedical Engineering, North Carolina State University and University of North Carolina

321 Metabolic Costs of Locomotion When Walking with and Without Ankle and Knee Braces
Smith J, Kievenaar C, Falgien V, Wilmes J
University of Northern Colorado

323 More is Not Always Better: Consequences of Exoskeleton Assistance in a Compliant Muscle-Tendon System
Robertson B, Sawicki G
UNC Chapel Hill/NC State Joint Dept of Biomedical Engineering

325 Muscle Contributions to Whole-Body Angular Momentum During Unilateral Below-Knee Amputee Walking
Silverman A, Neptune R
Colorado School of Mines

327 Trip Recovery Strategies in a Unilateral Transfemoral Amputee
Shirota C, Simon A, Kuiken T
Northwestern University

314 Kinematic Effects of Biomechanical Energy Harvest at the Ankle: Implications for Injury Susceptibility
Leemans A, Zifchock R, Gregory R, Brechue W
United States Military Academy

316 Reduced and Asymmetric Trunk Stiffness Among Unilateral Lower-Limb Amputees During Multi-Directional Trunk Perturbations
Hendershot B, Nussbaum M
Virginia Tech

318 Comparison of Powered and Unpowered Prostheses in Patients with Transtibial Amputation Walking on a Rock Surface
Gates D, Aldridge J, Wilken J
Brooke Army Medical Center

320 Transtibial Amputee Joint Motion Has Larger Lyapunov Exponents
Wurdeman S, Myers S, Stergiou N
Nebraska Biomechanics Core Facility

322 Biomechanical Design of Rolling Contact Knee Joint Prostheses
Slocum Jr A, Herder J, Varanasi K
MIT

324 The Effect of a New Microprocessor Controlled Prosthetic Knee on Stair Ascent Strategies in Patients with Unilateral Transfemoral Amputation
Aldridge J, Wolf E, Scoville C, Wilken J
Department of Orthopaedics and Rehabilitation, Center for the Intrepid, Brooke Army Medical Center

326 Spring-Mass Characteristics During Overground Running in Amputees Using Running Specific Prostheses
Hobara H, Baum B, Shim J
University of Maryland

328 Weight Bearing Asymmetries and Changes in COP Trajectories: Unilateral ERTL Amputees vs Non-Amputees
Carpenter A, Smith J, Christiansen C, Heise G
University of Northern Colorado

POSTER SESSION 2 | FRIDAY, 8:00 - 11:00 AM

BALLROOM A

PROSTHETICS & ORTHOTICS (CONTINUED)

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

- 329 The Effects of Independent Variations in Rearfoot and Forefoot Prosthesis Stiffness on Amputee Gait

Adamczyk P, Roland M, Hahn M, Sawers A

Intelligent Prosthetic Systems, LLC

- 330 A Comparison of the Effect of Foam-Box Casted and Plaster-Casted Orthotics on the Normal Foot Population Using Bi-Planar X-Ray Fluoroscopy

Bushey K, Balsdon M, Dombroski C, Jenkyn T

University of Western Ontario

- 331 An Externally Powered and Controlled Ankle-Foot Prosthesis for Use in Push-Off Experiments

Caputo J, Collins S

Carnegie Mellon University

- 332 Two-Dimensional Parameter Study to Characterize Performance of Ankle-Foot Orthosis Joint Impedance Control

Eicholtz M, Collins S

Carnegie Mellon University

POSTER SESSION 2 | FRIDAY, 8:00 - 11:00 AM

BALLROOM A (SATURDAY THEMATIC POSTERS)

SEATING

ODD NUMBERS PRESENT 9:30 - 11:00

EVEN NUMBERS PRESENT 8:00 - 9:30

- S1 Bicycle Riding, Arterial Compression and Erectile Dysfunction

Parthiban S, Yang C, Jones L, Baftiri A, Niederberger C

University of Illinois at Chicago

- S2 Investigating the Etiology of Vibration-Induced Low Back Pain

Craig T, Soltys J, Wilson S

University of Kansas

- S3 Factors Associated with Pressure Ulcers: The Effects of Shear Loads on Blood Flow

Manorama A, Reid Bush T

Michigan State University

- S4 Tissue Deformation in the Seated Buttocks Model

Sonenblum S, Cathcart J, Winder J, Sprigle S

Georgia Institute of Technology

- S5 Effect of Seat Position Modifications on Upper Extremity Mechanical Loading During Manual Wheelchair Propulsion

Requejo P, Mulroy S, Munaretto J, Mendoza Blanco M, Wagner E,

McNittGray J

Rancho Los Amigos National Rehabilitation Center

POSTER SESSION 2 | FRIDAY, 8:00 - 11:00 AM

BALLROOM A (SATURDAY THEMATIC POSTERS)

MUSCLE

ODD NUMBERS PRESENT 9:30 - 11:00

- M1 Comparison of Sarcomere Heterogeneity Measured in Passive Live and Fixed Muscle
Sandercock T, Cash A, Tresch M
Northwestern University
-
- M3 Posture and Activation Dependent Variations in Shear Wave Speed in the Gastrocnemius Muscle and Aponeurosis
Chernak L, DeWall R, Thelen D
University of Wisconsin-Madison

EVEN NUMBERS PRESENT 8:00 - 9:30

- M2 Pennation Angle Variability in Human Whole Muscle
Infantolino B, Challis J
Penn State Berks
-
- M4 On the Ascent: The Soleus Operating Length is Conserved to the Ascending Limb of the Force-Length Curve Across Gait Mechanics in Humans
Rubenson J, Neville P, Heok L, Pinniger G, Shannon D
The University of Western Australia

OBESITY

ODD NUMBERS PRESENT 9:30 - 11:00

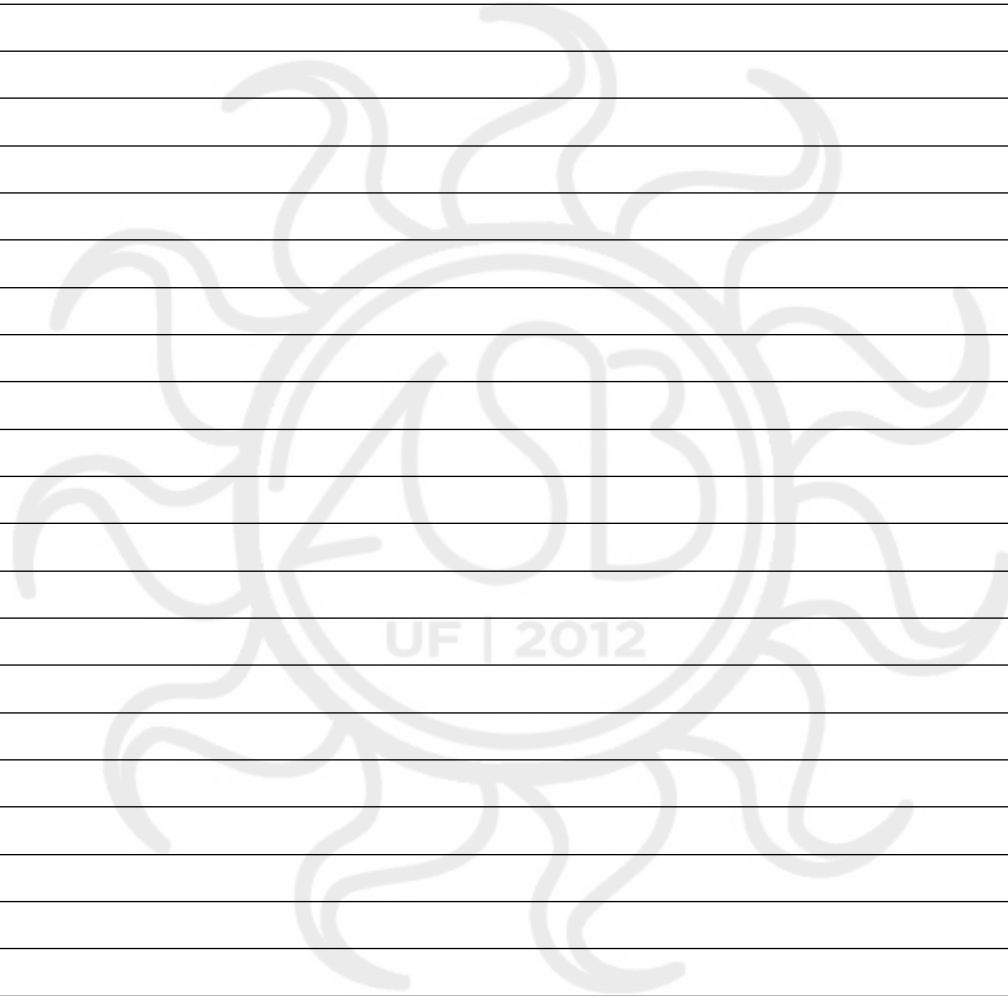
- P1 Magnitude and Time Course of Adaptation During Walking with a Passive Elastic Exoskeleton
Charalambous C, Dean J
Medical University of South Carolina
-
- P3 The Effects of Wearing a Spring-Loaded Ankle Exoskeleton on Soleus Muscle Mechanics During Two-Legged Hopping in Humans
Farris D, Sawicki G
North Carolina State University & UNC-Chapel Hill
-
- P5 Electromyographic Effects of Using a Powered Ankle-Foot Prosthesis
Williams M, Grabowski A, Herr H, D'Andrea S
Center for Restorative and Regenerative Medicine, PVAMC

EVEN NUMBERS PRESENT 8:00 - 9:30

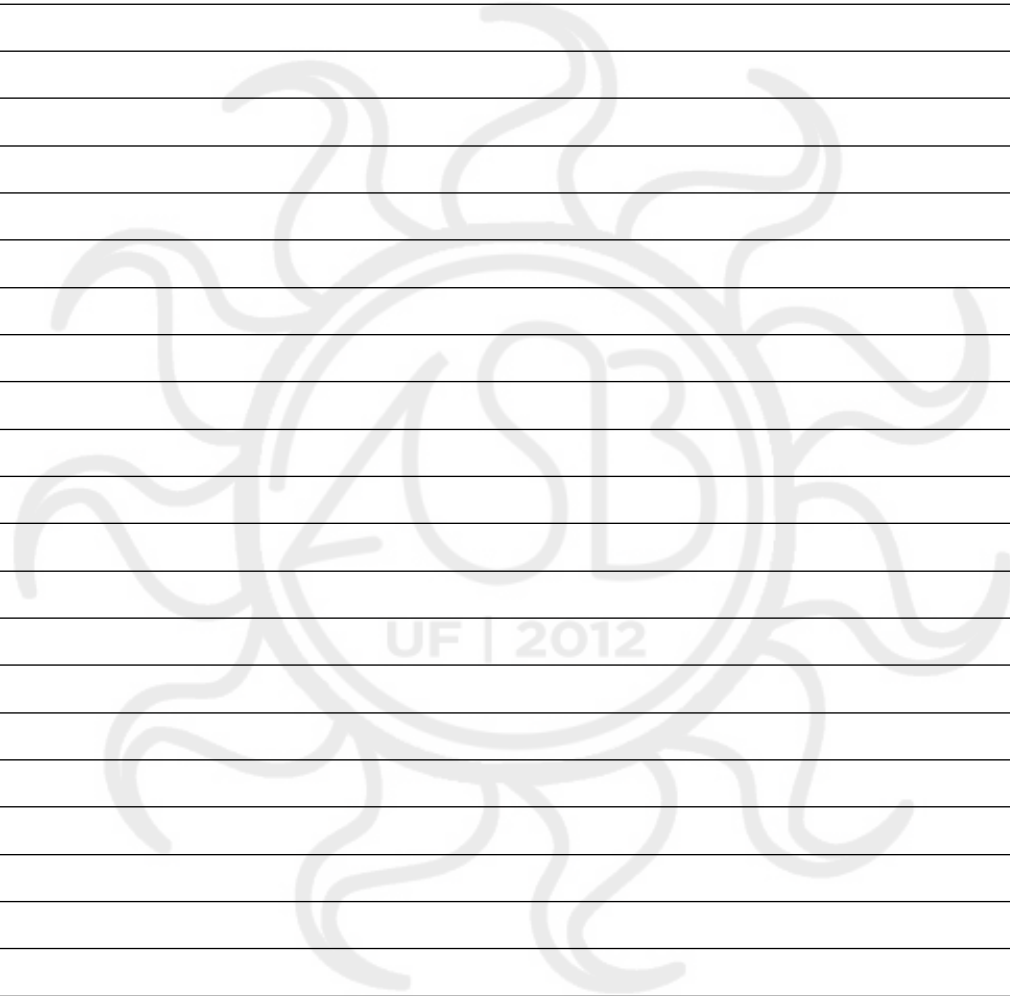
- P2 Exoskeleton to Carry a Backpack Load
Gregorczyk K, Adams A, O'Donovan M, Schiffman J, Bensele C, Brown M
U.S. Army Natick Soldier Research, Development and Engineering Center
-
- P4 Gait Mode Recognition Using an Inertia Measurement Unit on a Powered Ankle-Foot-Orthosis
Li Y, Hsiao-Weckler E
University of Illinois at Urbana-Champaign

NOTES

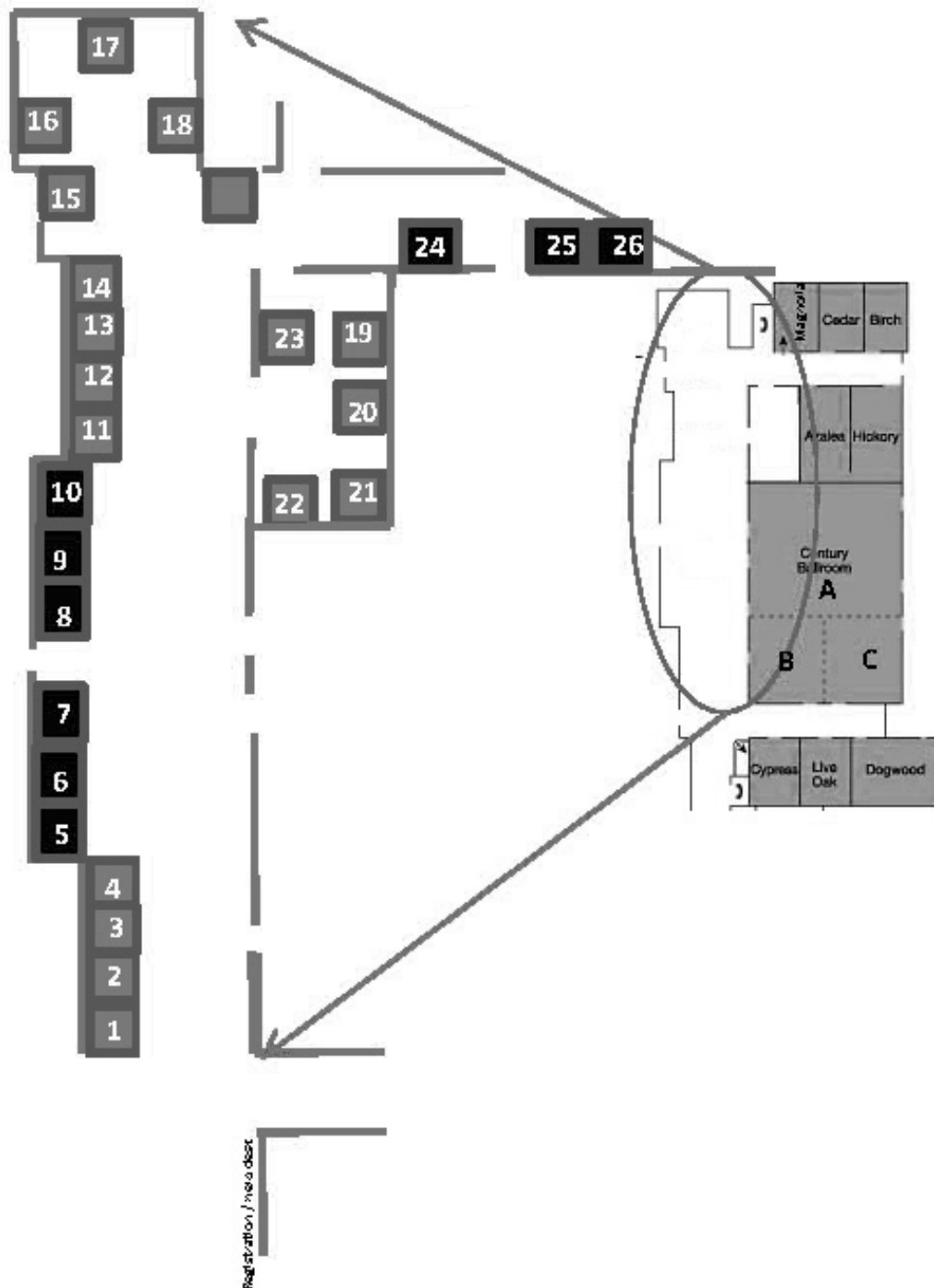
NOTES



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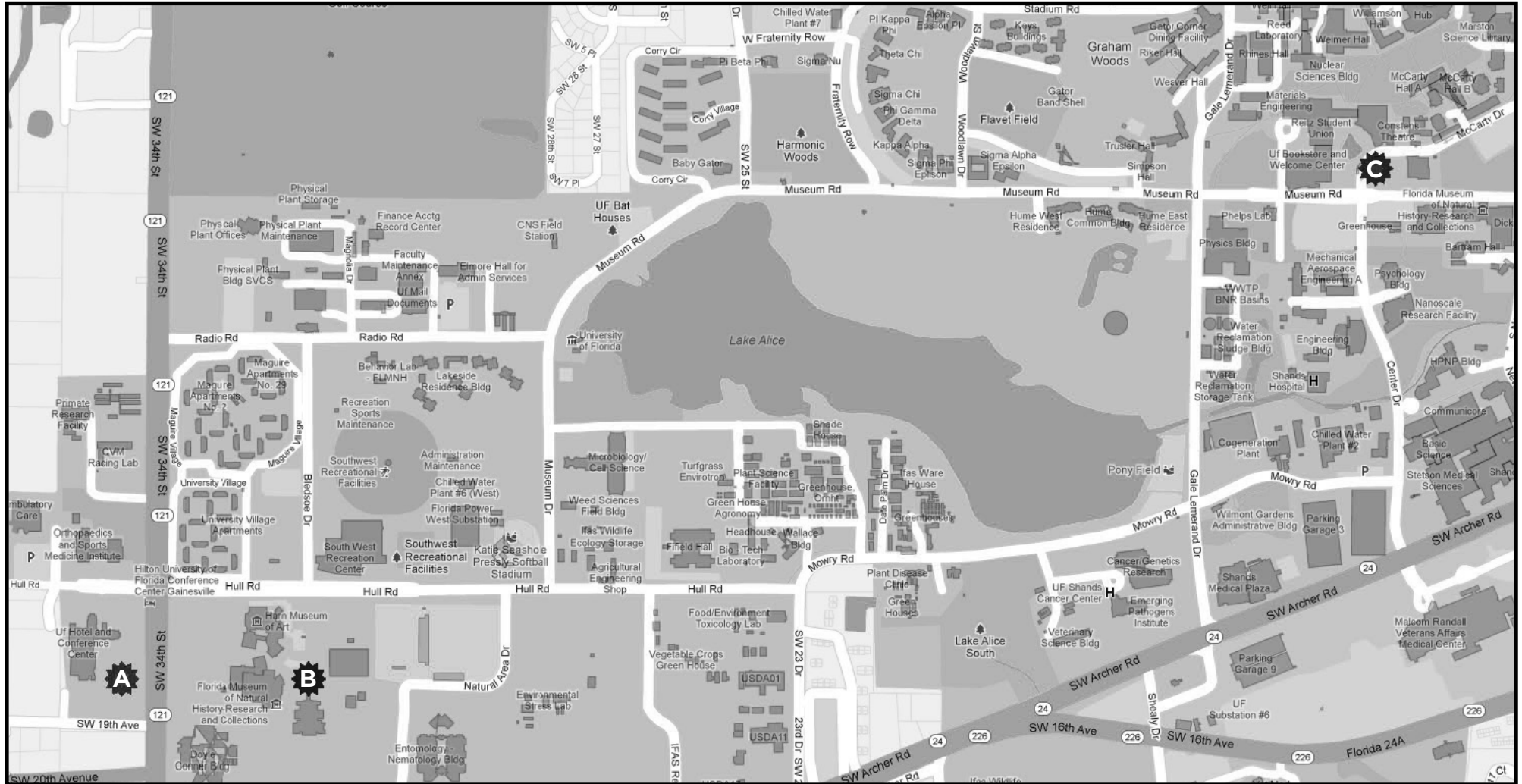


EXHIBITOR FLOORPLAN



| EXHIBITOR | BOOTH # |
|--------------------------------------|---------|
| Noraxon USA Inc. | 1 |
| Simi Reality Motion Systems GmbH | 2 |
| AnyBody Technology | 3 |
| Delsys Inc. | 4 |
| C Motion | 5 |
| Vicon | 6 |
| Northern Digital | 7 |
| Tekscan Inc. | 8, 9 |
| Polhemus | 10 |
| Kistler Instrument Corporation | 11 |
| Novel | 12 |
| Xcitex | 13 |
| AMTI | 14 |
| The Motion Monitor | 15 |
| ATI, Industrial Automation | 16 |
| Motion Analysis Corporation | 18 |
| Qualysis | 19 |
| Bertec | 20 |
| Metria Innovation Inc | 21 |
| ViTRAK Systems Inc | 22 |
| Footscan | 23 |
| Vision Research, AMETEK | 24 |
| ProtoKinetics | 25 |
| FDA/CDRH/Office of Device Evaluation | 26 |

UNIVERSITY OF FLORIDA CAMPUS MAP



- A. HILTON GAINESVILLE / UNIVERSITY OF FLORIDA CONFERENCE CENTER**
- B. UF CULTURAL PLAZA (PHILLIPS CENTER FOR THE PERFORMING ARTS: RECEPTION & KEYNOTES)**
- C. J. WAYNE REITZ UNION (BANQUET)**

ASB MEETING SCHEDULE AT A GLANCE

| | WEDNESDAY, AUGUST 15 | THURSDAY, AUGUST 16 | FRIDAY, AUGUST 17 | SATURDAY, AUGUST 18 | |
|-------|----------------------|--|--|---|--|
| | | CENTURY A CENTURY B CENTURY C AZALEA | CENTURY A CENTURY B CENTURY C AZALEA | CENTURY A CENTURY B CENTURY C AZALEA | |
| 7:00 | | BREAKFAST 7:00 - 8:00 (OPEN SEATING ENTIRE FIRST FLOOR) | | BREAKFAST 7:00 - 8:00 (OPEN SEATING ENTIRE FIRST FLOOR) | |
| 7:15 | | WELCOMING REMARKS (CENTURY A) | | WOMEN IN SCIENCE B'FAST (FLORIDA ROOM) | |
| 7:30 | | | | | |
| 7:45 | | PAST PRES B'FAST (ALBERT'S DINING ROOM) | | 5K FUN RUN | |
| 8:00 | | ORAL PRESENTATIONS (8:00 - 9:15 AM) | | | |
| 8:15 | | ORAL PRESENTATIONS (8:00 - 9:15 AM) BALANCE DURING LOCOMOTION TISSUE MECHANICS BONE STROKE (THEMATIC) | | ORAL PRESENTATIONS (8:00 - 9:30 AM) | |
| 8:30 | | | | POSTER SESSION 2 WITH REFRESHMENTS (8:00 - 11:00 AM) CENTURY A, DOGWOOD, HICKORY & AZALEA | |
| 8:45 | | BREAK AND EXHIBITS | | | |
| 9:00 | | | | ORAL PRESENTATIONS (9:45 - 11:00 AM) | |
| 9:15 | | ORAL PRESENTATIONS (9:45 - 11:00 AM) ASB FELLOWS SYMPOSIUM ERGONOMICS IMAGING: KNEE OBESITY (THEMATIC) | | | |
| 9:30 | | | | BREAK AND EXHIBITS | |
| 9:45 | | TRAVEL | | | |
| 10:00 | | | | ORAL PRESENTATIONS (11:30 AM - 12:45 PM) | |
| 10:15 | | TRIBUTE TO DAVID WINTER, PH.D., P.ENG. (11:15 AM - 12:15 PM) PHILLIPS CENTER FOR PERFORMING ARTS | | | |
| 10:30 | | | | ORAL PRESENTATIONS (11:30 AM - 12:45 PM) GAIT 1: METHODS POSTURAL CONTROL ORTHOPEDICS JOURNAL AWARDS (THEMATIC) | |
| 10:45 | | LUNCH (OPEN SEATING ENTIRE FIRST FLOOR) | | | |
| 11:00 | | | | LUNCH (OPEN SEATING ENTIRE FIRST FLOOR) | |
| 11:15 | | TRAVEL | | | |
| 11:30 | | | | ORAL PRESENTATIONS (1:30 - 3:15 PM) | |
| 11:45 | | ORAL PRESENTATIONS (1:30 - 3:15 PM) AGING AND GAIT SYMPOSIUM MOTOR CONTROL MUSCLE 1: MODELING & BEHAVIOR AMPUTEE GAIT (THEMATIC) | | | |
| 12:00 | | | | ORAL PRESENTATIONS (2:00 - 3:30 PM) | |
| 12:15 | | ORAL PRESENTATIONS (2:00 - 3:30 PM) FALLS COMPUTATIONAL MODELING RUNNING POWERED EXOSKELETON & PROSTHETICS (THEMATIC) | | | |
| 12:30 | | | | TRAVEL | |
| 12:45 | | ORAL PRESENTATIONS (3:45 - 5:15 PM) | | | |
| 1:00 | | | | POSTER SESSION 1 WITH REFRESHMENTS (3:30 - 6:30 PM) CENTURY A, DOGWOOD, HICKORY & AZALEA | |
| 1:15 | | TRAVEL | | | |
| 1:30 | | | | TRAVEL | |
| 1:45 | | TRAVEL | | | |
| 2:00 | | | | TRAVEL | |
| 2:15 | | TRAVEL | | | |
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| 6:45 | | TRAVEL | | | |
| 7:00 | | | | TRAVEL | |
| 7:15 | | TRAVEL | | | |
| 7:30 | | | | TRAVEL | |
| 7:45 | | TRAVEL | | | |
| 8:00 | | | | TRAVEL | |

CENTURY A

TUTORIAL I (CHALLIS)
12:30 - 2:30

TUTORIAL II (FREGLY)
2:40 - 3:10

TUTORIAL III (BANKS/MU)
3:20 - 4:20

STUDENT SPEAKERS
(4:30 - 5:30)

QUICK RESEARCH STUDIES
(MAGNOLIA & CEDAR)
ONGOING WEDS. - SAT.

LAB TOUR 1
(10:30 AM - 12:30 PM)

LAB TOUR 2
(2:00 - 4:00 PM)

ASB EXEC. BOARD MEETING
(BOARD ROOM)
2:00 - 5:00

EXEC. BOARD EXHIBITOR
(2-BITS LOUNGE)

OPENING RECEPTION
(5:45 - 7:45 PM)
FLORIDA MUSEUM OF NATURAL HISTORY

KEYNOTE LECTURE: SUSAN HARKEMA, PH.D.
(2:00 - 3:00 PM)
PHILLIPS CENTER FOR PERFORMING ARTS

TRAVEL VIA BUS

BANQUET & INDUCTION OF FELLOWS
(7:00 - 10:00 PM)
J. WAYNE REITZ UNION GRAND BALLROOM

TRIBUTE TO DAVID WINTER, PH.D., P.ENG.
(11:15 AM - 12:15 PM)
PHILLIPS CENTER FOR PERFORMING ARTS

BORELLI AWARD LECTURE: CARLO DE LUCA, PH.D.
(5:30 - 6:30 PM)
PHILLIPS CENTER FOR PERFORMING ARTS

NIGHT ON THE TOWN

APTA NETWORKING
(FLORIDA ROOM, 6:30 - 7:30 PM)

CLOSING CEREMONY & AWARDS
(CENTURY A)

ASB EXECUTIVE BOARD MEETING
(CLOSED MEETING - BOARD ROOM)
4:30 - 6:00 PM