



ASB Annual Meeting

AUGUST 13 - 16 2025

David L. Lawrence Convention
Center Pittsburgh, PA

www.asbweb.org

#ASB2025

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Welcome

WELCOME TO PITTSBURGH, PENNSYLVANIA AND THE 49TH ANNUAL MEETING OF THE AMERICAN SOCIETY OF BIOMECHANICS!



At a time when there are so many different pulls on your time and when budgets are tightening, we are honored that you have chosen to spend a few days engaging with your friends and colleagues. I hope you find the meeting full of intellectual stimulation, networking opportunities, professional development, and fun, and you return home recharged and excited to start the fall!

It has been a really interesting and rewarding year serving as your ASB President. I started with the expectation that we needed to refresh our strategic plan, and got so much more with changing federal and state priorities that we have had to respond to. For more on these, I welcome you to review July's newsletter and archived monthly e-News. But back to the Annual Meeting...

The annual meeting has always been and continues to be the greatest example of our mission, "to encourage and foster the exchange of information and ideas among biomechanists working in different disciplines and to facilitate the development of biomechanics as a basic and applied science." I encourage all of you, especially first-time attendees, students and trainees, to take advantage of this nurturing and friendly environment. Introduce yourself to peers and leaders. One great way to do this is to come up to them after you've attended a talk or poster they've presented and ask a question! I still make it a goal to ask at least one question at every session I attend to help get myself out of my shell. And if you've been here before, take some time to catch up with colleagues you may only see once a year at ASB.

The Program Committee and Meeting Committee have been hard at work putting this meeting together for over year, and your schedule will be full from morning to night with great content. Special thanks go to Robin Queen (Program Chair), Kurt Beschorner (Meeting Chair), Maria Pasquale (Treasurer), Paula Kramer (Student Rep) and Michelle Smith (Conference Manager), who have led great teams in managing all of the decisions, big and small, that go into this. I want to give a special shout out to Kurt's planning, determination, and optimism that secured us funding from both NIH and NSF even in these turbulent times to broaden participation in biomechanics at this year's ASB meeting. Thanks as well to all of the members of the Executive Board for your contributions to the Annual Meeting and throughout the year.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ajit Chaudhari'.

Ajit Chaudhari, PhD

The Ohio State University

President, American Society of Biomechanics

Society Information

AMERICAN SOCIETY OF BIOMECHANICS

The American Society of Biomechanics (ASB) was founded in 1977 to encourage and foster the exchange of information and ideas among biomechanists working in different disciplines and to facilitate the development of biomechanics as a basic and applied science.

ASB has a membership of approximately 850 academic researchers, clinicians, scientists, students, and industry members working to solve basic and applied problems in the realm of biomechanics and to improve understanding of the workings of biological systems. ASB members are organized into five primary discipline categories: biological sciences, exercise and sports science, health sciences, ergonomics and human factors, and engineering and applied science.

LEADERSHIP

Ajit Chaudhari, Ph.D., President,
The Ohio State University

Sara Myers, Ph.D., Past-President,
University of Nebraska at Omaha

Katherine Saul, Ph.D., President-Elect,
North Carolina State University

Maria Pasquale, Treasurer,
Novel Electronics Inc

Young-Hui Chang, Ph.D., Treasurer-Elect,
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Lisa Macfadden, Ph.D., Secretary,
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Allison Altman-Singles, Ph.D., Education Chair,
Penn State Berks

Evan Dooley, Ph.D., Communications Chair,
Biocore LLC

Cara Lewis, Ph.D., Newsletter Editor,
Boston University

Robin Queen, PhD., Program Chair,
Virginia Tech University

Kimberly Bigelow, Ph.D., Program Chair-Elect,
University of Dayton

Kurt Beschorner, Ph.D., Meeting Chair,
University of Pittsburgh

Christopher Wilburn, Ph.D., Diversity Chair,
Auburn University

David B. Lipps, Ph.D., Awards Chair,
University of Michigan

Paula Kramer, Student Rep,
University of Utah



asbweb.org

WHAT DOES THE ASB OFFER TO STUDENTS

In addition to having an elected Executive Board position for a student representative, ASB provides several venues for student engagement in Society initiatives and student participation at the Annual Meeting.

ENGAGEMENT IN SOCIETY INITIATIVES

Over the last few years, the Student Committee has initiated and organized initiatives dedicated to students and early career researchers.

- 1. Ask-Me-Anything (AMA) Series** Student Author AMA Series is a series of online events by and for students. The AMA series features students that have recently published a paper talking to other students about their research and sharing their experience with the publishing process. The Student Committee has organized 8 events in the last 12 months. Participation is free. Recordings of past events are available on the website (asbweb.org/student-author-ama-series)
- 2. Professional Development Series.** Started in the Fall of 2022, the novel Professional Development online events are geared toward students' professional development. This series of workshops features students, post-docs, faculty, and industry partners who will discuss topics chosen by the ASB Student Committee. Topics will include navigating career choices post-graduation, managing work/life balance, and finding/applying for funding opportunities. Participation is free. Recording of past events are available on the website (asbweb.org/professional-development-series)
- 3. Student Chapters** The ASB Student Body provides comprehensive intellectual and professional development among students. Networking, collaboration, and discourse throughout the ASB Student Body is essential to the long-term growth of the society as a whole, as future industry and academic leaders will arise from today's students. There are 14 active Student Chapters at universities around the country, and the Student Committee provides excellent support for students who wish to form their own Student Chapter.
- The Diversity Committee and Affinity Groups have also created several initiatives outside of the Annual Meeting to support students from disadvantaged backgrounds. These are open to all members, and many events are open to anyone regardless of ASB membership.
- 4. Biomechanics Summer Undergraduate Research Experience (B-SURE):** This program offers scholarship support to students from disadvantaged backgrounds to pursue research mentored by an ASB member. It is intended to remove the barriers associated with financial need and a lack of a professional network.
- 5. Black Biomechanists Association: BBA** offers community outreach, professional programming, supportive mentoring, and other programming to support Black Biomechanists and Allies throughout the year.
- 6. International Women in Biomechanics: IWB** hosts monthly teleconference meetings and workshops aimed to provide resources and professional training to the IWB community.
- 7. Latinx in Biomechanix: LiB** provides networking opportunities and uplifts its members' accomplishments to support Latinx Biomechanists and Allies.
- 8. The Biomechanics Initiative: TBI** leads National Biomechanics Day events worldwide, focusing and leveraging our outreach efforts to grow Biomechanics especially in under-served communities.

PARTICIPATION IN THE ANNUAL MEETING

While the specific student activities may vary from year to year, here are some typical student-focused activities that the ASB offers:

- 1. Student travel awards:** The ASB offers complimentary registration (value \$300) to help students cover the costs associated

with attending the Annual Meeting. These awards are typically competitive. In 2023, the application was simplified by integrating the application with the submission process. For the 2023 Annual Meeting, the ASB is supporting 25 students.

2. **Diversity travel awards:** The ASB offers complimentary registration (value \$300) to help individuals from historically excluded and marginalized groups to attend the Annual Meeting. These awards are also competitive. For the 2023 Annual Meeting, the ASB is supporting 18 individuals (16 students, 2 post-docs).
3. **Student volunteer opportunities:** the ASB often seeks student volunteers to assist with various tasks during the Annual Meeting. In exchange for their time and effort, volunteers receive a complimentary registration. For the 2023 Annual Meeting, the ASB is supporting 10 students.
4. **Student-specific sessions:** The ASB organizes sessions and workshops specifically tailored to students' needs and interests. These sessions can provide valuable networking opportunities, career guidance, and educational content designed to support student development in the field of biomechanics.
5. **Mentoring program:** The ASB Student Committee organizes the one-on-one mentoring program that matches students with faculty for mentoring at the meeting and afterwards. This program includes a dedicated lunch for program participants to meet.
6. **Diversity event & Women In Science event:** The ASB Diversity Committee organizes a lunch meeting every year focused on equity & inclusion for people from marginalized groups, and an evening event focused on equity & inclusion for female & non-binary individuals and their allies. These events provide networking and capacity building opportunities for all attendees. In 2023 the topic of discussion at the Diversity Lunch is citation bias, and the topic of discussion at the Women In Science Event is the Likeability Trap.
7. **Workshops:** The ASB offers many workshops at the Annual Meeting every year, and several are focused on issues disproportionately affecting members from marginalized groups, teaching-intensive institutions and others who don't have the resources, network, and institutional knowledge that the largest research-intensive institutions have.
8. **Affinity group meetings:** The ASB welcomes affinity groups to the Annual Meeting as a venue to cultivate cohort and community building. See the meetings scheduled for the 2025 Meeting at asbweb.org/affinity-groups/
9. **Networking opportunities:** The ASB organizes several social events designed to facilitate networking among students as well as with professionals.
 - **Student Social / Night Out:** A casual, fun event designed for students to network with Student Committee members, Student Chapter representatives and fellow students.
 - **Student Welcome Event:** Often held after the Opening Reception, another fun event for student networking.
 - **Job Market Poster Session** (a more recent addition to the program). In this novel session, delegates searching for biomechanics jobs in the upcoming year will present posters that introduce themselves, their background/skills/research/etc. (essentially a "job talk" in poster form), to people at institutions who will be searching/hiring in biomechanics in the upcoming year.
10. **Student room sharing:** The ASB facilitates a process by which delegates can share hotel rooms and accommodation costs.
11. **Student presentation award:** The ASB recognizes outstanding student poster presentations at the Annual Meeting with the President's Award.

General Conference Information

CODE OF CONDUCT

Membership in professional societies, including the American Society of Biomechanics (ASB), has implied expectations for ethical behavior in research, teaching, and service to all segments of society.

All members of and/or participants in ASB events shall:

- Honor and respect the field of biomechanics by conducting oneself responsibly, ethically, and lawfully.
- Participate in respectful scientific debate.
- Hold paramount the safety, health, and welfare of the public.
- Provide truthful, accurate, relevant, and evidence-based information based upon competence in the subject matter and knowledge of the facts and disseminate without deception.
- Abide by the basic principles of respect of persons, beneficence, and justice and comply with regulations in accordance with each person's institutional review board.
- Endeavor to increase the knowledge in the discipline and within reasonable limits of time and finance, shall make available that knowledge, skill, and training to the public for the benefit of all.
- Disclose any conflicts of interest and review the professional work of others fairly and in confidence.
- Recognize the contributions of others and not associate or allow the use of their name on enterprise known to be illegal, fraudulent or of questionable character.
- Participate in activities contributing to the improvement of the biomechanics community.

- The ASB is committed to fostering open dialogue and the exchange of scientific ideas, with mutual trust based upon honesty, integrity, and respect for all persons. It is the policy of the ASB that all participants attending both in-person and virtual ASB-sponsored activities (videoconference attendees or social media contributors) including attendees, vendors, ASB representatives, volunteers, and all other stakeholders will conduct themselves in a professional manner that is welcoming to all and free from any form of discrimination, intimidation, harassment, or retaliation. Creating a supportive environment to enable discourse is the responsibility of all members and all participants at ASB activities.

Inappropriate actions, statements, or conduct based on individual characteristics such as age, religion, race, ethnicity, sexual orientation, gender identity, gender expression, marital status, nationality, political affiliation, ability status, educational background, or any other personal characteristic, or other disruptive or harassing behavior of any kind will not be tolerated. The ASB has a reporting system with both anonymous and non-anonymous option. All reports will be investigated and sanctions up to and including expulsion from the ASB may be imposed, as detailed in the Investigations Policy.

If a crime is being committed or you fear for your immediate safety, please contact the local authorities or 9-1-1.

All members and participants at ASB activities are expected to be familiar with and positively accept the full ASB Code of Conduct as a condition of participation.

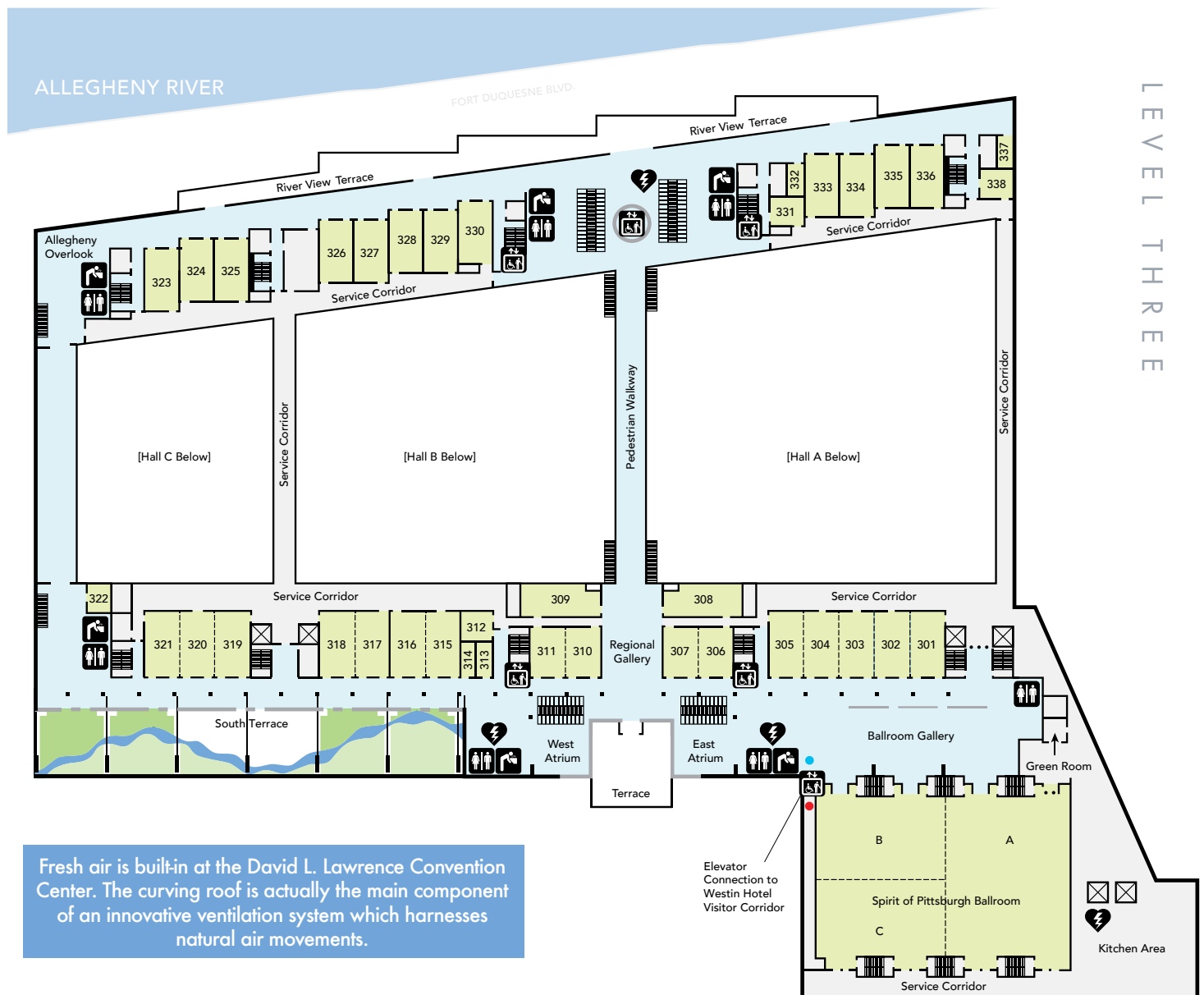
VENUE

David L Lawrence Convention Center

1000 Fort Duquesne Boulevard
Pittsburgh, PA 15222

All scientific conference sessions will take place in this location.

VENUE LAYOUT



WIFI ACCESS

Complimentary wireless internet is available to the delegates of the ASB Meeting throughout the Conference Center and facilities. To use the complimentary wireless, select **ASB 2025 network**, and use the **password: Mayoishiring**. Please note the complimentary Wi-Fi is ideal for checking emails and websites but is not strong enough for streaming videos or heavy social media use. .

REGISTRATION

REGISTRATION FOR ASB 2025 INCLUDES:

- Four full days of robust, peer reviewed scientific content including keynote speakers, awards sessions, workshops, symposia sessions, individual orals, and dedicated poster sessions, as well as professional development opportunities.
- On-site welcome reception with food and drinks
- Daily lunches and coffee breaks
- Two poster sessions
- Opportunity to purchase tickets to the banquet dinner at a highly subsidized rate.
- Complimentary WIFI in the conference space
- Digital program and conference app
- Complimentary access to pre-conference workshops
- The opportunity to network with colleagues, collaborators, and others in the biomechanics community

NAME BADGES

Your name badge is your admission ticket to the preconference workshops, conference sessions, coffee breaks, lunches, and receptions. Please wear it at all times. At the end of the conference, we ask that you recycle your name badge in one of the name badge recycling stations that will be set out or leave it at the registration desk.

REGISTRATION AND INFORMATION DESK HOURS

The ASB registration and information desk, located on the third floor of the David L Lawrence Convention Center will be open during the following dates and times:

Wednesday, August 13	8:00 AM – 6:00 PM
Thursday, August 14	8:00 AM – 4:30 PM
Friday, August 15	7:30 AM – 4:00 PM
Saturday, August 16	7:45 AM – 4:00 PM

If you need assistance during the conference, please visit the registration desk.

POSTER INFORMATION:

SET-UP / REMOVAL

POSTER SESSION 1 – Thursday, August 14

Set Up: Between	8:30 AM – 4:30 PM
Session Time:	4:30 PM – 6:30 PM
Tear Down:	Please tear down directly after the session.

POSTER SESSION 2 – Friday, August 15

Set Up: Between	7:30 AM – 4:00 PM
Session Time:	4:00 PM – 6:00 PM
Tear Down:	Please tear down directly after the session.

STAFF

ASB staff from Podium Conference Specialists can be identified by orange 'STAFF' ribbons on their name badges. Feel free to ask anyone of our staff for assistance. For immediate assistance please visit us at the registration desk.

MEALS

Daily coffee breaks and lunches are provided Thursday to Saturday. A small welcome reception and poster reception are also provided for all attendees. The dinner banquet is an additional fee and pre-registration is required. Please see the Registration Desk if you'd like to add the conference dinner. All other meals are on own. Please view the full program for times.

DIETARY REQUIREMENTS

If you noted a dietary requirement when registering it will be noted on the back of your name badge. All lunches are a to go buffet. If your dietary need is specific, please see a member of the catering team.

CONFERENCE APP

Download the conference app for the most current program information, abstracts, and the opportunity to network with other delegates. Create your own schedule, review talks, and even make plans for the evenings.

Scan the QR code below to load it on your devices.



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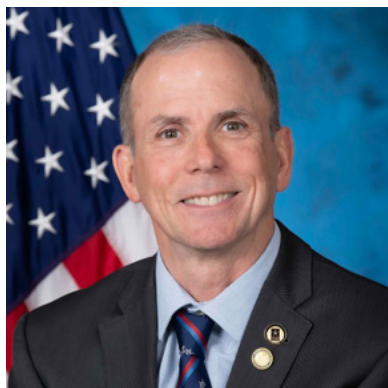
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Keynote Speakers



KEYNOTE 1 THURSDAY AUGUST 14 11:15 AM – 12:15 PM

RORY COOPER

*University of Pittsburgh and
US Department of Veterans Affairs*

National Medal Laureate Rory A. Cooper, PhD, PLY is the founding director of the Human Engineering Research Laboratories, a joint center of the University of Pittsburgh (Pitt) and US Department of Veterans Affairs (VA).

He is a VA Senior Research Career Scientist and the FISA Foundation –

Paralyzed Veterans of America Distinguished Professor at Pitt. Cooper has authored or co-authored over 400 peer-reviewed journal publications. He has over 30 patents awarded or pending. He is the author of two books: "Rehabilitation Engineering Applied to Mobility and Manipulation" and "Wheelchair Selection and Configuration", and co-editor of "An Introduction to Rehabilitation Engineering", "Warrior Transition Leader: Medical Rehabilitation Handbook" and the award winning book "Care of the Combat Amputee". Cooper is an elected member of the National Academy of Engineering and Fellow of the National Academy of Inventors, as well as RESNA, IEEE, AIMBE and BMES. In October 2023, he was awarded the National Medal of Technology and Innovation by President Biden and he was inducted into the 50th class of the National Inventors Hall of Fame. His students have won numerous awards and are leaders throughout the world.

Forging a new future with people with disabilities



KEYNOTE 2 FRIDAY AUGUST 15 10:15 AM – 11:15 AM

SUZANNE MAHER

Hospital for Special Surgery

Suzanne is Chief Research Officer, Senior Scientist, Associate Director of the Department of Biomechanics and Co-Director of the Soft Tissue Research Program at Hospital for Special Surgery (HSS), NYC. She is a Professor of Applied Biomechanics in Orthopaedic Surgery, Weill Cornell Medicine and an Adjunct Professor, Department of Biomedical Engineering, Cornell University.

She obtained her mechanical engineering degrees from University College Dublin and Trinity College Dublin, Ireland. She has been a Scientist at HSS since 2002, which was punctuated by a period of research at the Cartilage Biology and Orthopaedics Branch at NIH. Her early research focused on the pre-clinical evaluation of materials intended for total joint replacement, but she gradually morphed that expertise to developing models to quantify knee joint contact mechanics, tissue response, and the functional performance of materials for meniscal/ chondral repair. Dr. Maher's NIH funded studies have resulted in polymer technology which led to a spin out life sciences company, the first in the history of HSS, to commercialize a non-degradable implant for cartilage defects, and have provided new insights into the mechanical factors driving joint tissue degeneration.

Transforming clinical care of damaged knees: The critical role of MD-PhD partnerships

Over 500 million patients worldwide are living with osteoarthritis (OA), leading to limited mobility and downstream effects on physical and mental health. Joint replacements, developed through partnerships between engineers and surgeons, have transformed the lives of millions of patients worldwide, but our ability to delay the progression of joint damage after injury is limited. Dr. Maher's thesis is that to innovate novel solutions for the treatment and prevention of joint degeneration we must embrace heterogeneity in patients as we develop and test novel solutions and in how we design clinical trials. Using the example of the meniscus, Dr. Maher will illustrate how new partnerships and team-based science, aligned with the surgeons delivering care, is poised to challenge the status quo..

Award Winners



BORELLI AWARD TALK

SATURDAY AUGUST 16 10:15 AM – 11:15 AM

DARRYL THELAN

University of Wisconsin

Darryl G. Thelen is the John Bollinger Chair and the Bernard A. and Frances M. Weideman Professor at the University of Wisconsin–Madison, where he also serves as Chair of the Department of Mechanical Engineering. He earned his BS in mechanical engineering from Michigan State University and his MSE and PhD from the University of Michigan. Professor Thelen directs the UW Neuromuscular Biomechanics Lab, where he leads the development of computational models, wearable sensors, and dynamic imaging technologies to investigate the functional loading of musculoskeletal tissues. His work focuses on understanding the biomechanics and neuromuscular coordination of human movement, with the goal of informing and improving clinical practices in orthopedics, rehabilitation, and sports medicine. His research has been supported by the National Institutes of Health, the National Science Foundation, and the Department of Defense. He is a Fellow of both the American Society of Mechanical Engineers and the American Society of Biomechanics.

Models, Sensors, and the Forces of Motion

Advances in biomechanics are driven by the interplay between models that predict and experiments that reveal. This lecture explores how coupling physics-based models with novel sensing technologies can enable us to probe the tissue-level forces that underlie human movement. I will highlight how integrated approaches using wearable sensors can be used to investigate muscle-tendon loading in movement, and how such mechanics are altered by pathologies and interventions. These methods can be translated into clinical assessment tools, rehabilitation strategies, and movement-assistive technologies that extend beyond the laboratory and into real-world environments. Underlying this work is the belief that models and measurements must evolve together, allowing us to bridge fundamental principles with practical impact.



JIM HAY MEMORIAL AWARD

JEFF CRANDALL

Biocore LLC

The ASB Jim Hay Memorial Award recognizes originality, quality, and depth of biomechanics research that addresses fundamental research questions relevant to extraordinary demands imposed in sport and exercise.

Jeff Crandall is co-founder and CEO of Biomechanics Consulting and Research (Biocore), LLC and Board Member of Infinite Athlete, Inc. He is the Nancy and Neal Wade Professor of Engineering and Applied Sciences (Emeritus) at the University of Virginia and was the director of the UVA Center for Applied Biomechanics from 1994 until he retired from the University in 2019. Dr. Crandall's research has focused on understanding human response and injury with application to the fields of sports and automobile safety. He has served as an engineering consultant to the National Football League for the past 17 years and co-chairs the NFL-NFLPA Engineering Committee. He has authored more than 700 technical papers, been awarded 7 patents, and received the Department of Transportation's United States Government Award for Engineering Excellence.

Engineered advances in sports safety and performance

This presentation outlines a systems-based approach to reducing sports-related injuries through athlete-specific protective strategies. Building on foundational methods from fields such as automotive crash biomechanics and public health surveillance, the framework incorporates the three E's—engineering, enforcement, and education—within a data-driven ecosystem designed to advance both injury mitigation and performance optimization. On-field data is collected through wearable inertial sensors and computer vision systems, enabling the reconstruction of high-risk movement patterns, analysis of impact mechanics, and quantification of exposure across position-specific scenarios. Complementing laboratory-based impact testing and field instrumentation, advanced modeling techniques—including finite element analysis, multibody dynamics, and machine learning—enable virtual assessment of protective equipment, infrastructure modifications, athlete biomechanics, and rules under a wide range of simulated practice and game conditions. Central to this approach is the concept of the Digital Athlete, a longitudinal, individualized model that integrates historical player data across modalities and timeframes to inform risk prediction and intervention design. Finally, the framework acknowledges that injury prevention and performance are interdependent objectives, emphasizing the development of protective solutions that mitigate risk without diminishing athletic output.



FOUNDERS' AWARD

PETER ADAMCZYK

University of Wisconsin-Madison

The Founders' Award was established in 2017 to recognize scientific accomplishment in biomechanics and excellence in mentoring and is open to investigators of all disciplines within ASB.

Dr. Peter Adamczyk earned degrees in Mechanical Engineering from Case Western Reserve University (B.S.) and the University of Michigan (M.S. and Ph.D) in the areas of Robotics and Biomechanics. He spent several years running a startup company dedicated to advancing the science and technology of lower-limb prosthetics and real-world motion assessment. He joined the University of Wisconsin-Madison in 2015, and is now the Mead Witter Foundation Associate Professor in Mechanical Engineering, with affiliations in Biomedical Engineering and Electrical and Computer Engineering. He directs the Biomechatronics, Assistive Devices, Gait Engineering and Rehabilitation Laboratory (UW BADGER Lab, <http://uwbadgerlab.engr.wisc.edu>) and teaches courses in Robotics and Mechatronics.

Dr. Adamczyk's research aims to enhance physical and functional recovery from impairments affecting walking, running, and standing. Core foci include basic research on locomotion biomechanics; design of semi-active foot prostheses for gait restoration after amputation; wearable sensors for movement assessment during real-life activities; and rehabilitation robotics to explore motor learning and neural adaptation in the lower limb.

Finding your style in biomechanics research

The breadth and depth of biomechanics provides rich opportunities for different approaches, perspectives, and purposes. From deep dives into detailed phenomena, to philosophical developments of methodology, to scaled trials of clinical impact, research in our field needs different styles for different problems and has ways for every taste and temperament to contribute. This talk will reflect on these different styles of research, how some of them have appeared in and shaped my career, their joys and challenges, and ways to help oneself and others flourish by recognizing how our questions and our styles can all fit together to move our field forward.



JEAN LANDA PYTEL AWARD FOR DIVERSITY MENTORSHIP IN BIOMECHANICS

BROOKE ODLE

Hope College

The Jean Landa Pytel Diversity Mentoring Award, started 2019, recognizes the long-term impact of mentoring on both the careers of individual scientists, including women and individuals from other traditionally under-represented backgrounds in ASB, and the ultimate betterment of our society as a whole.

Dr. Brooke Odle is a biomedical engineer by training and specializes in rehabilitation and biomechanics. She earned a bachelors of science in bioengineering from the University of Pittsburgh, a masters of science in biomedical engineering from New Jersey Institute of Technology, and a doctor of philosophy in biomedical engineering from New Jersey Institute of Technology and Rutgers University Biomedical and Health Sciences. She completed postdoctoral training at Case Western Reserve University. To explore her calling as an educator, mentor, and researcher, she joined Hope College in 2019 as a faculty fellow and became faculty in 2020. As a Christian with the heart of a servant-leader, she merges her God-given spiritual gifts of mercy and shepherding with her leadership strengths in restoration, connection, harmony, learning, and development to fulfill her roles as a professor. These roles include teaching, research, advising, and service- to the campus community, her professional community, and the community in which she lives. She strives to leave people and places better than she found them and views her work as a professor through a lens of service. As a researcher, she conducts interdisciplinary research across campus to gain a better understanding of human movement and injury prevention. Her primary work explores how nursing students perform manual patient-handling tasks. She works with student researchers to develop interventions to reduce the risk of musculoskeletal injuries associated with the performance of these tasks. As a teacher, she serves her students by seeking innovative ways to engage them with course material, providing them with individualized feedback to help them grow, and preparing them to enter the engineering workforce or continue their studies in graduate or professional school. As an individual who identifies as a Black woman with Puerto Rican roots, she wants all students, especially those who identify with historically marginalized backgrounds, to know that they are seen and supported. To pay forward the gifts of mentorship she has received and continues to receive, Dr. Odle mentors Hope College students, junior scholars in her field and actively supports mentoring and diversity, equity, justice, and inclusion efforts in the professional societies to which she belongs and within her local community.

Superheroes, supervillains, and guides: How superhero stories can inform mentoring practices in biomechanics

Superheroes are prevalent in popular culture and media- from comic books and graphic novels, plays, movies, television series, and video games. These stories appeal to the good in humanity, inspire us with examples of triumph in the face of adversity, and present qualities and characteristics that are aspirational. Superheroes are only as good as the supervillains they fight; so crafty and powerful nemeses give us reasons to cheer for superheroes in the fight of "good" versus "evil." Thus, it is critical to develop compelling stories to align the audience with either the superheroes or supervillains. These stories help us connect to and empathize with these characters. In some cases, when the supervillains are more like antiheroes, their origin

stories can evoke sympathy for them, demonstrating the motivations for their actions and highlighting the flaws and complexities of human beings and their behaviors. As depicted in superhero stories, the stories we tell ourselves about our experiences and those others speak over us shape us. In addition, superhero stories often introduce us to the guides who influence them. These stories parallel successful and unsuccessful mentoring practices. Using superhero stories as a vehicle to discuss these mentoring practices in biomechanics, Dr. Odle's Pytel Award presentation has four main objectives: (i) to share her narrative as it relates to her journey in biomechanics, (ii) to encourage the audience to reflect on their own journey in biomechanics, (iii) to ring the alarm for more inclusive mentoring practices in biomechanics, and (iv) to challenge the audience to answer this alarm with a call to action.



GOEL AWARD FOR TRANSLATIONAL RESEARCH IN BIOMECHANICS

JOSH CAPUTO

Humotech

The Goel Award, newly created in 2016, recognizes outstanding accomplishments in translational biomechanics research, entrepreneurship, and societal benefit.

Josh Caputo, PhD, is the President & CEO of Humotech, a company he spun out of Carnegie Mellon University in 2015 to provide the world's first hardware/software platform that supports researchers and developers pursuing innovations in prosthetics & orthotics, exoskeleton technology, and other wearable machines. Trained as a multi-disciplinary engineer/scientist concentrated on robotics, his work focuses on addressing gaps in how wearable products are invented, designed, and fit to human users. Josh's driving passion is to help realize a world where everyone can access the devices they need to lead happier, healthier, and more productive lives.

Biomechanical curiosities to medical necessities: An entrepreneur's tale

What began as a mission to optimize the biomechanics of powered prosthetic ankles has grown into a commercial R&D platform with over 40 deployments, advancing both our understanding of human movement and methods for delivering effective wearable assistance. With clinical breakthroughs on the horizon, I'll share the entrepreneurial journey behind Humotech—navigating translational research, startup survival, and clinical adoption—to show how biomechanics can influence real-world medical necessity decisions.



ASB EARLY CAREER ACHIEVEMENT AWARD

SCOTT UHLRICH

University of Utah

Dr. Uhlrich directs the Movement Bioengineering Lab at the University of Utah, where he is an Assistant Professor of Mechanical Engineering and Orthopaedic Surgery. His research aims to improve human mobility using scalable digital health technology. His work leverages computational biomechanics, machine learning, mobile sensing, and imaging with applications in osteoarthritis, neuromuscular diseases, and aging. His group develops open-source software for movement analysis using smartphone video (OpenCap), which is used by thousands of researchers to conduct out-of-lab biomechanics studies. Dr. Uhlrich also develops biomechanical interventions for osteoarthritis and has tested them in clinical trials. Prior to joining the University of Utah, Dr. Uhlrich received his MS and PhD in Mechanical Engineering from Stanford University. After a postdoctoral fellowship in Bioengineering at Stanford, he became the Director of Research at the Stanford Human Performance Laboratory. Dr. Uhlrich received the Clinical Biomechanics Award from ASB and the Young Investigator Award from the Osteoarthritis Research Society International. He also co-founded a company to make his video-based biomechanics software available to clinicians.



ASB PRE-DOCTORAL ACHIEVEMENT AWARD

SOYONG SHIN

Carnegie Mellon University

Soyong Shin is a Ph.D candidate in the Department of Mechanical Engineering at Carnegie Mellon University (CMU), where he works with Dr. Eni Halilaj. His research focuses on developing new open-source markerless motion tracking methods that use AI to harness information from emerging technologies, such as smartphone cameras and/or inertial sensors. Among others, these include WHAM, which leverages a single moving camera, and DeepGaitLab, a multi-view motion capture system that will be introduced at ASB 2025. Soyong is the recipient of the Korean Government Scholarship for Studying Overseas, the CMU Center for Machine Learning and Health Fellowship, CMU's Presidential Fellowship, and the Meta AI Mentorship Program Fellowship. During his PhD, Soyong was a visiting researcher at the Max Planck Institute for Intelligent Systems, Meta Reality Labs Research, and Meta AI Research (FAIR), advancing intelligent systems for human movement analysis. Previously, Soyong received his M.S. in Mechanical Engineering from Carnegie Mellon University and his B.S. in Mechanical Engineering from Seoul National University.



ASB JUNIOR FACULTY RESEARCH AWARD

YING FANG

Rosalind Franklin University

Dr. Fang is an Assistant Professor in the Department of Physical Therapy at Rosalind Franklin University. She earned her PhD in Biomedical Engineering at Worcester Polytechnic Institute, focusing on improving bone health in people with Spinal Cord Injury. Prior to joining RFU, Dr. Fang completed postdoctoral training in the Biomechatronic Lab at Northern Arizona University, where she implemented assistive technologies in neurorehabilitation and received an NIH F32 Postdoctoral Fellowship. Dr. Fang's current research focuses on developing and implementing novel rehabilitation interventions, such as biofeedback, to improve gait and function of people with neurological disorders. With the support from the ASB Junior Faculty Research Award, she will develop a new line of research that combines biomechanics and psychology to understand the physical and mental aspects of fall prevention.

UP AND COMER AWARDS

The "Up and Comer" Award, sponsored by the ASB Council of Fellows, is intended to foster mentoring and networking of post-doctoral trainees and early career faculty with ASB Fellows of similar research interests.



UP AND COMER AWARD

MARIA RAMOS GONZALEZ

Massachusetts Institute of Technology

Dr. Maria Ramos Gonzalez is a Distinguished Postdoctoral Research Fellow whose multidisciplinary research covers human-in-the-loop for robotic manipulation tasks and neuroprosthetic feedback control paradigms for upper limb amputees. Her doctoral research at the University of Nevada, Las Vegas (UNLV) included the design and fabrication of a novel biocompatible polycarbonate urethane knee implant. She also designed and fabricated a multi-knee joint implant test apparatus for long-term wear testing and validation of the novel implant. As a postdoctoral fellow, Maria's innovative work holds great promise for advancing our understanding of human sensation, improving prosthetic design and control, and delivering technologies that improve lives at all levels of integrated human robotics applications. In addition, she aims to make these kinds of life-enhancing engineering solutions accessible to underserved populations.



UP AND COMER AWARD

HANNAH HOUDE

University of Texas Medical Branch

Hannah Houde is a postdoctoral research fellow in the Department of Physical Therapy and Rehabilitation Sciences at the University of Texas Medical Branch, where she works with Dr. Melissa Morrow to investigate shoulder health and movement patterns in manual wheelchair users, focusing on how daily life demands contribute to shoulder tendon injury.

Hannah earned her bachelor's degree in Therapeutic Recreation & Strength and Conditioning from Lock Haven University, followed by a master's in Adult Education and certificate in Movement Skills Analysis from Auburn University, where she also completed her doctorate in Biomechanics in Kinesiology. Her educational background and practical training have equipped her with a well-rounded foundation for analyzing human movement.

Her research centers on biomechanics in para-athletes, with a big-picture goal of bridging the gap between clinical and applied research in Paralympic sports. Drawing from hands-on experience gained from working with Auburn Wheelchair Basketball and Wheelchair Tennis, she is passionate about advancing parasport performance and minimizing injury through movement analysis.

Through the Up and Comer Award, Hannah is especially looking forward to benefiting from Dr. McNitt-Gray's expertise as it will help further develop a deeper understanding of mechanics used across various sports. Dr. McNitt-Gray's mentorship will allow Hannah to be engaged in preparation for the LA 2028 Paralympic Games. Additionally, she will have the opportunity to work with the Rancho Research Institute Coach WELL program at Rancho Los Amigos National Rehabilitation Center—a Spinal Cord Injury Model System. This program provides opportunities to translate research findings into practice by training coaches who develop athletes in parasports.

Hannah is excited for future opportunities with her mentor, Dr. McNitt-Gray, and continued mentorship from Dr. Morrow as she works to establish her research in this specialized field and address the biomechanical needs of diverse populations.



UP AND COMER AWARD

GAURI DESAI*University of Maryland, College Park*

Dr. Gauri Desai is a postdoctoral research associate at the University of Maryland, College Park, in the Department of Kinesiology's Neuromechanics Core. She received her MSc in Sport and Health Sciences from the University of Exeter, United Kingdom, and her PhD in Biomechanics from Indiana University-Bloomington. Dr. Desai's current research focuses on two main areas: (1) uncovering running-related injury risk factors, with a focus on women-specific biomechanical and endocrinological factors, and (2) complementing experimental methodology with optimal control simulations to examine the energetic and biomechanical consequences of clinical conditions like lower limb amputations. Dr. Desai seeks to drive research and innovation that accounts for the unique characteristics of her studied populations. She hopes that such an approach will foster the design of well-informed musculoskeletal injury risk mitigation interventions that can be effectively adopted by the communities they are designed to serve.

In her pursuit of translational research, Dr. Desai is part of the Female Athlete Science and Translational Research Team (FASTR) at Stanford University, where her upcoming research will focus on identifying the tissue-level biomechanical and endocrinological risk factors of bone stress injuries among both adolescent girls and post-partum women engaged in sport. In an effort to take science to communities, Dr. Desai serves as a Topical Expert in Biomechanics at VOICEINSPOORT, a digital community designed to empower and connect girls and young women in sports, ages 13 to 23. Through its platform, young girls and women athletes gain access to original science-backed content, mentoring, and one-on-one or group sessions centered around their unique biomechanical, physiological, nutritional, and mental health needs. Additionally, Dr. Desai is an active member of the Women in Sports Tech (WiST) community, which seeks to address the gender gap in sports and technology by improving women's access to early career opportunities. Dr. Desai hopes to continually engage in translational research to address crucial gaps like the gender-health gap, which has historically challenged the effective adoption of scientific findings for better health and performance among women.



UP AND COMER AWARD

LUCINDA WILLIAMSON*University of Illinois Chicago*

Dr. Lucinda Williamson is a Bridge-to-Faculty Postdoctoral Scholar in the Richard and Loan Hill Department of Biomedical Engineering at the University of Illinois Chicago and a Visiting Scholar at the Shirley Ryan AbilityLab's Center for Bionic Medicine. Their research in translational biomechanics integrates experimental and computational approaches to understand human movement, with a focus on injury prevention, training load management, and return-to-play in sport.

Dr. Williamson earned their PhD from the University of Iowa, where they developed a novel multi-scale modeling framework combining musculoskeletal and contact mechanics to evaluate how ankle-foot orthoses influence muscle forces and joint contact stress during walking. This work aimed to reduce the risk of post-traumatic osteoarthritis (PTOA) following injury. Motivated by the long-term impact of PTOA, they are now expanding into sports biomechanics to focus on early intervention and prevention. Their current work uses markerless motion capture, wearable sensors, and machine learning to create proactive tools for estimating injury risk, guiding return-to-sport decisions, and monitoring athlete performance over time.

In addition to their technical contributions, Dr. Williamson brings a lived understanding of the systemic barriers in STEMM and actively works to advance equity, inclusion, and belonging through leadership in DEI-focused research, mentorship, and education.

Workshops and Tutorials

ASB's Workshops and Tutorials are open to all registered delegates of the conference but please note, some workshops have reached capacity and may not have space for individuals on a waiting list or walk ins. Pre-registration was required. Please check with the registration desk to determine if still space available.

MORNING WORKSHOPS

WS1: Empowering educators: Harnessing AI to transform your pedagogy

9:00 AM – 1:00 PM ROOM 310/311

Allison Altman-Singles¹, Kristyne Wiegand², Matthew Wittstein³, Nikita Kuznetsov⁴, Sabrina Lee⁵

¹ Penn State Berks, ² Eastern Washington University, ³ Elon University, ⁴ University of Cincinnati, ⁵ Northwestern University

WORKSHOP OVERVIEW

This interactive workshop is designed for biomechanics educators who wish to deepen their understanding of artificial intelligence (AI), enhance their AI literacy, and apply its capabilities in their classrooms. Building on the success of the 2024 ASB Tutorial "AI in the Classroom: An Unseen Force," this session will explore how faculty can use AI more efficiently to improve their teaching practices and promote AI literacy among students to enhance learning outcomes. The current academic landscape is one of shrinking resources. How can we use AI to fill some of these resource gaps?

The workshop will include a focus on developing faculty AI literacy, integrating AI into teaching for better student engagement, and addressing ethical implications. Participants will engage in small-group exercises to create AI-enhanced course content and reflect on ethical challenges, ensuring AI is used responsibly in their teaching practices.

WS2: Your networking plan for ASB 2025

9:00 AM – 1:00 PM ROOM 406

Kurt Beschorner¹, Christopher Wilburn², James Finley³, Paula Kramer⁴, Vani Hiremath Sundaram⁵

¹ University of Pittsburgh, ² Auburn University, ³ University of Southern California, ⁴ University of Utah, ⁵ Max Planck Institute for Intelligent Systems

WORKSHOP OVERVIEW

Who Is This For:

This workshop is designed for students, early-career researchers, and anyone looking to feel more comfortable and confident networking at ASB.

Workshop Overview:

Networking can often feel awkward and intimidating – the idea of striking up conversations with strangers can be nerve-wracking. But it doesn't have to feel like a chore! At its core, networking is about building genuine connections that benefit everyone involved. ASB is an ideal place to form these connections, and this workshop will help participants approach networking in a way that feels natural, effective, and aligned with their strengths.

What We'll Discuss:

By the end of this workshop, participants will take away...

1. A new perspective on networking as a way to build meaningful, collaborative relationships.
2. Strategies that align with different personalities and social comfort levels.
3. A polished, authentic elevator pitch that participants can use to introduce themselves.
4. A head start on creating their own network at ASB 2025.

Workshop Agenda:

1. Rethinking networking: We will address common misconceptions and reframe networking as an opportunity to align with personal goals and values.
2. Personalize networking: Each person will learn to develop their preferred networking style and approach networking in a way that plays to individual strengths.
3. Crafting an elevator pitch: Participants will develop engaging, efficient introductions, which can be used throughout the meeting.
4. Speed networking: Networking is all about practice! Participants will hone their skills in a low-pressure environment while actively building connections.
5. Panel discussion: ASB and industry leaders will share their experiences and advice on best practices for networking.

WS3: Rigid body registration and kinematic calculations in dynamic radiographic datasets using Slicerautoscoper

9:00AM – 11:00AM ROOM 319/320

J.J. Trey Crisco¹, Bea Paniagua², John Holtgrewe¹, Cesar Lopez³, Amy Morton¹, Shelly Belsky²

¹ Brown University and Brown Health, ² Kitware, Inc., ³ Mayo Clinic

WORKSHOP OVERVIEW

Image-based object tracking performed with biplane videoradiography (BVR) is the state-of-the-art for accurate quantification of in vivo skeletal kinematics. BVR involves the frame-by-frame registration of three-dimensional (3D) rigid body volumes (e.g. bones and implants) to videoradiographs. The processes currently used to prepare image datasets, compute kinematics, and visualize output can involve multiple proprietary software programs and/or custom-written code. Method variability and in-house developments inhibit collaboration, limit transparency, reproducibility, and ultimately impede clinical translation. We have developed an extensible, open-source, software program for image-based skeletal and implant motion tracking with NIH support. SlicerAutoscooper^M, referred to as "SAM", provides researchers with a structured preprocessing workflow, full access to an ever-growing index of community-driven tools and powerful GPU enabled software to optimize registration and compute six degree-of-freedom rigid body kinematics from BVR datasets. Researchers at all levels who use imaging systems to study arthrokinematics of skeletal structures and implants are our targeted audience. Attendees are encouraged to bring data from their labs for an interactive discussion with the workshop instructors and other attendees. Using provided sample data or their own datasets and SAM in the 3D Slicer environment, attendees will preprocess data into suitable input for 3D optimized tracking in BVR. A demo of ongoing tracking within 4DCT datasets will also be presented. Users will also acquire foundational knowledge of the 3D Slicer platform, and how to retrieve

existing software tools through the Extension index. The hands-on and guided tutorials will encourage discussion on use and solicit recommendations from users for improvements and future options.

Results & Outcomes:

- Education on the implementation of SlicerAutoscooper^M with BVR datasets
- Resources for joining the SlicerAutoscooper^M discourse community and contributing to product development through issue submissions

Learning Outcome Levels:

- Use of SlicerAutoscooper^M with sample datasets
- Understanding the advantages and challenges of an open-source approach to arthrokinematics.
- Introduction to 3D Slicer

Audience Involvement:

- Open Discussion for current use, improvements, and future options
- Hands-on use of SlicerAutoscooper^M

WS4: Funding for biomechanics research

11:00 AM – 1:00 PM ROOM 317/318

Toyin Ajisafe¹, Joseph Wasser², Shivani Sharma³, Brian Schulz⁴

¹ National Institutes of Health, ² Defense Health Agency, ³ National Science Foundation, ⁴ Veterans Health Administration

WORKSHOP OVERVIEW

The federal government funds biomechanics research. There are numerous available funding opportunities across multiple agencies. This workshop will include representatives from the National Institutes of Health (NIH), National Science Foundation (NSF), Veterans Health Administration (VHA), and U.S. Army Medical Research and Development Command (USAMRDC). They will present information on research programs and initiatives, and training and career development opportunities. Focus areas will include examples of research that fits in each agency and expectations of applicants.

Federal representatives attend conferences like ASB to meet with attendees, answer questions, disseminate funding opportunities, and learn about cutting-edge science. Some federal representatives may be able to facilitate new collaborations by connecting people performing similar research or addressing related research questions using a different strategy. Attendees will have opportunities during the workshop and the conference to reach out to these individuals with questions or for additional information.

After short presentations by designated agency speakers, there will be an open panel discussion and Q&A, followed by table discussions with panelists. Contact information will be provided. This workshop is appropriate for researchers of all career stages. Presentations will be geared toward early career researchers, while the open panel discussion may be helpful for all investigators. Participants will gain basic understanding of the federal funding application and review processes, as well as similarities and differences between the respective funding agencies. Speakers will bring unique perspectives on how and where to apply for funding.

AFTERNOON WORKSHOPS

WS5: *MyoAssist: Simulating human neuromechanics and assistive devices in MyoSuite*

2:00 PM – 6:00 PM ROOM 317/318

Seungmoon Song¹, Calder Robbins¹, Hyungseo Son¹

¹ *Northeastern University*

WORKSHOP OVERVIEW

Accurate and reliable digital twins of humans and wearable robots can revolutionize assistive robotics. This tutorial will provide an introduction and hands-on examples of MyoAssist, an open-source, reinforcement learning (RL)-friendly neuromechanical simulation platform designed to advance the development of assistive devices. MyoAssist is a new package within MyoSuite, a broader open-source collection of musculoskeletal environments and tasks built in the MuJoCo physics simulator and wrapped in an RL-friendly interface using the OpenAI Gym API. MyoAssist integrates forward neuromechanical simulations of musculoskeletal models with assistive devices (e.g., exoskeletons or robotic prosthetics) and RL or optimization tools, offering unique capabilities compared to traditional approaches in the biomechanics community, such as reference motion tracking or trajectory optimization (e.g., OpenSim Moco). This tutorial will provide biomechanics researchers with the opportunity to explore neuromechanical simulations, assistive device modeling, and control development. Participants will acquire practical skills in setting up ankle exoskeleton environments, defining device properties, training RL-based controllers, and optimizing reflex-based controllers and exoskeleton parameters to generate diverse gait behaviors.

WS6: *Women in Biomechanics Wikipedia edit-a-thon*

2:00 PM – 6:00 PM ROOM 319/320

Katherine Knaus¹, Caitlin Banks²

¹ *Colorado School of Mines*, ² *Kennedy Krieger Institute*

WORKSHOP OVERVIEW

Women and gender-diverse individuals have historically been underrepresented in biomechanics. Despite their significant contributions, their online presence remains limited, perpetuating disparities in recognition. Wikipedia is one of the world's most-visited websites, yet women account for under 20% of its 2 million bios. This gender bias means the contributions of women and gender-diverse people are less likely to be discovered. Wikipedia Edit-a-thons are part of a global movement to address this and ensure their achievements are visible and acknowledged!

This workshop is highly relevant to biomechanics, underscoring the importance of equity, diversity and inclusion in shaping the field's future. By recognizing and celebrating the achievements of diverse contributors, we foster a more inclusive scientific community. We want the next generation to imagine a future in biomechanics and the online visibility of gender diversity in biomechanics is key. Edit-a-thons offer a fun and interactive way to learn new skills and network while helping boost the online visibility of women and gender diverse people in biomechanics.

This event complements a previous workshop at ANZSB 2024 and an upcoming workshop at ISB 2025, furthering global efforts to amplify the presence of underrepresented individuals in biomechanics. At ANZSB

2024, there were 6 new Wikipedia pages created, 30 pages edited, and 111 total edits under the Women in Biomechanics theme. The workshop will appeal to a broad audience of ASB members as it combines technical skill development with community-building efforts to promote representation, and requires no prior wiki-editing experience. Attendees will leave empowered to continue these efforts beyond the workshop, amplifying visibility and equity in biomechanics.

WS7: Distilling dynamics of human movement from experimental data

2:00 PM – 6:00 PM ROOM 406

Aaron Likens¹, Seung Kyeom Kim¹, Vasileios Mylonas¹, Marilena Kalaitzi Manifrenti¹

¹ *University of Nebraska at Omaha*

WORKSHOP OVERVIEW

From free fall to celestial motion, the search for patterns in data has led to the discovery of natural physical laws. Johannes Kepler discovered the third law of planetary motion by identifying and symbolically representing patterns, providing insights that revolutionized astrophysics. Likewise, uncovering hidden patterns in complex biomechanical data is key to advancing our understanding of human motion. Historically, a broad array of tools has been used to model the complex relationships in human movement data, but many lack interpretability and lack meaningful physical constraints. Symbolic Regression (SR) addresses those limitations by discovering interpretable mathematical expressions that adhere to physical constraints, offering researchers insights that might otherwise remain hidden. This interactive workshop introduces SR (along with its theoretical and practical underpinnings), to provide attendees with a transformative approach to biomechanical modeling. Through a combination of lectures and interactive activities, attendees will learn the theory behind genetic programming, which is the algorithmic backbone of SR. The presenters will also discuss the specific application of genetic programming in SR. Later workshop sections will provide hands-on experience using Python-based software to perform SR on workshop-provided datasets, with the option to analyze their own data for personalized insights. The workshop will also address best practices for integrating SR into biomechanics. College level algebra and basic Python proficiency are recommended but not required. We aim to accommodate researchers, clinicians, and students of all levels, providing an accessible yet rigorous introduction to a cutting-edge modeling method in human movement science.

Symposia Sessions

Symposia sessions are held as concurrent sessions with other contributed talks. These sessions have been submitted as full sessions with 3 – 5 speakers during the 90 minute period of time.

THURSDAY, AUGUST 14

S1: The importance of advocacy in biomedical engineering research

Karen Troy ¹, Dawn Beraud ², Katherine Saul ³, Jill Higginson ⁴

¹ Worcester Polytechnic Institute, ² American Institute for Medical and Biological Engineering (AIMBE), ³ North Carolina State University, ⁴ University of Delaware

The executive and legislative branches of the US government play pivotal roles in developing policies that govern and fund the scientific enterprise. These activities, often conducted without scientific voices, help shape research and funding decisions across several federal agencies and at institutions across the country. Given the complex interplay between policy and research, scientists' involvement in the process is more crucial than ever. There are several impactful ways for biomedical engineers to contribute to public policy to benefit the field and society. In this symposium hosted in collaboration with the American Institute for Medical and Biological Engineering (AIMBE), we will highlight such avenues and resources for scientists to inform policy decisions by showcasing the perspectives of different experts in the field of biomechanics research.

S2: Neuromechanics in action: integrating the neural control and biomechanics of walking

Sarah Roelker ¹, Nidhi Seethapathi ², Gelsy Torres-Oviedo ³, Daniel Ferris ⁴, Jessica Allen ⁴

¹ University of Massachusetts Amherst, ² Massachusetts Institute of Technology, ³ University of Pittsburgh, ⁴ University of Florida

Recent years have seen remarkable progress in understanding the neural control of human locomotion, from fundamental principles to clinical applications. Future progress in addressing locomotor impairments and enhancing locomotor performance requires integration of insights from the nervous system with our knowledge of biomechanics, i.e., neuromechanics. This symposium aims to showcase the breadth and interconnectedness of research in the areas of neural control, from the periphery to the cortex, and the biomechanics of walking, including empirical phenomena as well as simple and complex modeling approaches, in healthy and clinical populations. The presenters will highlight both foundational and cutting-edge work in experimental and computational neuromechanics and discuss future directions for the field of neuromechanics.

FRIDAY, AUGUST 15

S3: Advancing our understanding of the biomechanics of real-world wheelchair use: perspectives, tools, and innovations for improving health and quality of life

Melissa Morrow ¹, Stephen Cain ², Omid Jahanian ³, Kerri Morgan ⁴, Rachel Cowan ⁵, Dan Ding ⁶, Shiv Hiremath ⁷

¹ University Medical Branch Texas, ² West Virginia University, ³ Mayo Clinic, Superscript ⁴ Washington University in St. Louis, ⁵ University of Alabama at Birmingham, ⁶ University of Pittsburgh, ⁷ Temple University

Research on wheelchair biomechanics has traditionally focused on propulsion mechanics and injury prevention through lab-based studies. Through the advancement of wearable sensor technology, mobile health interventions, and the recognized value of measuring the lived experience, increasing attention has been given to studying the biomechanics of wheelchair use in the real-world to understand and improve both mobility and non-mobility activities of daily living in the home and community. In this symposium, researchers with different perspectives and research goals will discuss how they approach the vast opportunities for measuring and improving real-world biomechanics of wheelchair use, underscoring the current barriers and the necessary steps to significantly advance our collective efforts in improving wheelchair user mobility, health and quality of life. The speakers have significant experience in utilizing wearable sensors on the wheelchair and body to capture interaction with the home, work, and community environments; the adaptation of methods and algorithms to capture physical activity in able-bodied adults and wheelchair users; the translation of clinical rehabilitation training to the daily life; the use and improvement of assistive technology; and the use of real-time mobile-health feedback interventions to improve daily movement behaviors. The overall objectives of the symposium are to educate the audience about the different approaches and cutting-edge tools, improve understanding of the biomechanics of wheelchair use, and discuss how to apply this knowledge to improve independence and participation of wheelchair users. The content will also be relevant to those interested in upper extremity biomechanics or translating lab data to real-world applications.

SATURDAY, AUGUST 15

S4: Walk this way, reach that way: exchanges between upper- and lower-limb biomechanics

Steven Charles ¹, Jennifer Nichols ², Meghan Vidt ³

¹ Brigham Young University, ² University of Florida, ³ Pennsylvania State University

Upper and lower limb biomechanics are often studied separately, likely due to their different functions, loads, and movement patterns. Investigators may spend their entire career focused on either the upper or lower limb, or a single joint or segment, with limited understanding of the research methods and findings of similar joints or segments in the other limb. However, the upper and lower limbs evolved in parallel and share many similarities, making comparisons and cross-over of approaches valuable. This symposium aims to encourage learning, foster discussion, and facilitate idea exchange between upper- and lower-limb biomechanists, focusing on comparisons at three joint levels (proximal, distal, and multi-segment) in three research areas: imaging and clinical application, experimental and computational methods, and motor control.

S5: Integrating patients' lived experiences into your biomechanics research

Samuel Acuña ¹, Andrew Sawers ², Erica King ¹

¹ George Mason University, ² University of Illinois Chicago

This symposium discusses practical ways of incorporating qualitative insights from patients and users into your biomechanics research. We highlight the importance of lived experiences in contextualizing biomechanical research, which is an aspect increasingly called for by our funding agencies. Featuring expert panelists and interactive discussions, attendees will learn practical methods for integrating qualitative approaches, fostering collaborations, and enhancing study participation. This session promotes equity and bridges engineering and clinical domains, inspiring attendees to adopt patient-centered methodologies for impactful research and design.

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Affinity Groups

ASB CHRISTIAN BIOMECHANICS

THURSDAY, AUGUST 14 DURING THE LUNCH BREAK

The Christian Biomechanics Fellowship is a group of ASB members who have decided to become Jesus followers. We meet over lunch at the ASB annual meeting to get to know one another, to encourage one another, and to hear how God is working in and through the lives of other ASB Jesus followers. At this year's conference luncheon, we will consider why God has placed each of us on our respective college campuses and discuss creative ways that we can demonstrate the love of Jesus in a winsome manner to those whom God has placed around us.

BLACK BIOMECHANISTS ASSOCIATION (BBA) AND LATINX IN BIOMECHANIX (LIB)

THURSDAY, AUGUST 14 7:30PM - 9:00PM COOP DE VILLE (2305 SMALLMAN ST)

Latinx in Biomechanix (LiB) and the Black Biomechanists Association (BBA) are teaming up once again for a joint social hour—and you're invited! Join us for a relaxed happy hour where members, friends, and new faces can catch up, connect, and celebrate community. Whether you're already involved or simply curious to learn more about what we do, this is a great opportunity to mingle and get to know two organizations committed to uplifting scientists of color. Both LiB and BBA are 501(c)(3) non-profit organizations with a shared mission to support diversity, equity, and inclusion in the biomechanics community. Allies are always welcome!

AMERICAN BASEBALL BIOMECHANICS SOCIETY ANNUAL BUSINESS MEETING

FRIDAY, AUGUST 15 DURING THE LUNCH BREAK

The American Baseball Biomechanics Society (ABBS) is a professional society that promotes research, discussion, and the exchange of ideas among biomechanists with an interest in baseball, as well as baseball professionals with an interest in biomechanics. ABBS members and any other individuals attending ASB who are interested in learning more about the rapidly-growing field of baseball biomechanics are invited to attend our annual business meeting.



INTERNATIONAL WOMEN IN BIOMECHANICS SOCIAL (OFF-SITE)

WEDNESDAY, AUGUST 13 7:30PM - 9:00PM BILLS BAR AND BURGER (1001 LIBERTY AVE)

Join members and allies of the International Women in Biomechanics (IWB) community for an evening of connection, support, and celebration. This informal off-site social event welcomes all who are passionate about promoting equity and inclusion within the biomechanics field. Whether you're new to IWB or a returning supporter, this is a chance to expand your network, share experiences, and learn more about ongoing efforts to support women and under-represented genders in biomechanics.

Appetizers will be served on site.

This event is generously sponsored by HAS-Motion.

HAS Motion

ORTHOPAEDIC BIOMECHANICS INTEREST GROUP SOCIAL (OFF-SITE)

THURSDAY, AUGUST 14 7:30PM - 9:00PM THE EAGLE - PITTSBURGH (737 PENN AVE)

Are you passionate about biomechanics AND orthopaedic research? Join us for a happy hour meet-up with fellow scientists and friends on Thursday, August 14th! 2025 will be the second year we gather at the ASB annual meeting for a new ASB sub-community called Orthopaedic Biomechanics Interest Group. We are launching this community with the Orthopaedic Research Society (ORS), a non-profit partner of the ASB. ORS is an international society of engineers, biologists, clinicians, and students who work on basic, translational, and clinical sciences for musculoskeletal discovery to improve health. ASB and ORS teamed up in 2024 to enhance the networking among orthopaedic biomechanics researchers; empower early-career scientists and trainees with knowledge and resources; cultivate a diverse, inclusive, and engaged community; and advocate for the impact of musculoskeletal biomechanics research. The Orthopaedic Biomechanics Interest Group will serve as a hub at the intersection of ASB and ORS, where we exchange study ideas, learn the cool work of our peers, dream about the future of science in orthopaedic biomechanics, while enjoying good times with friends old and new! This happy hour meet-up is sponsored by the ORS Ambassador program. We will provide free beverages and snacks to attendees; non-alcoholic options are available. We hope to see you there!

TEACHING BIOMECHANICS INTEREST GROUP (T-BIG)

SATURDAY, AUGUST 16 AT LUNCH TIME

"The effects of GenAI on teaching biomechanics" hosted by the Teaching Biomechanics Interest Group (T-BIG). Grab your lunch and join us for a teaching focused discussion.

Detailed Program

All sessions will be held in the David L Lawrence Convention Center

WEDNESDAY, AUGUST 13, 2025

9:00AM - 1:00PM Room 310/311	WS1: Empowering educators: Harnessing AI to transform your pedagogy Jj Wallace¹, Allison Altman-Singles², Matthew Wittstein³, Nikita Kuznetsov⁴, Sabrina Lee⁵, Kristyne Wiegand⁶ ¹ Transylvania University, ² Penn State Berks, ³ Elon University, ⁴ University of Cincinnati, ⁵ Northwestern University, ⁶ Eastern Washington University
Room 406	WS2: Your networking plan for ASB2025 Kurt Beschorner¹, Vani Hiremath Sundaram², Christopher Wilburn³, James Finley⁴, Paula Kramer⁵ ¹ University of Pittsburgh, ² Max Planck Institute for Intelligent Systems, ³ Auburn University, ⁴ University of Southern California, ⁵ University of Utah
9:00AM - 11:00AM Room 319/320	WS3: Rigid body registration and kinematic calculations in dynamic radiographic datasets using SlicerAutoscooperM Joseph Crisco¹ ¹ Brown University
11:00AM - 1:00PM Room 317/318	WS4: Funding for biomechanics research Jennifer Jackson¹, Toyin Ajisafe¹, Brian Schulz², Joseph Wasser³, Shivani Sharma⁴ ¹ National Institutes of Health, ² Veterans Health Administration, ³ Defense Health Agency (Knowesis Inc.), ⁴ National Science Foundation
1:00PM - 2:00PM	LUNCH ON OWN
2:00PM - 6:00PM Room 317/318	WS5: MyoAssist: Simulating human neuromechanics and assistive devices in MyoSuite Seungmoon Song¹, Hyoungseo Son¹, Calder Robbins¹ ¹ Northeastern University
Room 319/320	WS6: Women in biomechanics Wikipedia edit-a-thon Caitlin Banks¹, Katherine Knaus² ¹ Kennedy Krieger Institute, ² Colorado School of Mines
Room 406	WS7: Distilling dynamics of human movement from experimental data Aaron Likens¹, Seung Kyeom Kim¹, Marilena Kalaitzi Manifrenti¹, Vasileios Mylonas¹ ¹ University of Nebraska at Omaha
5:30PM - 6:00PM Room 304/305	STUDENT WELCOME EVENT/MEET UP Join other students for this quick networking event prior to the opening reception.

6:00PM - 7:30PM South Terrace	OPENING RECEPTION Join us for food, drinks and networking opportunities!
7:30PM - 11:00PM The Puttery 1415 Smallman St	STUDENT NIGHT OUT Join other students for a fun night out! Sponsored by University of Pittsburgh <div>  University of Pittsburgh </div> <div> Swanson School of Engineering Bioengineering </div>
THURSDAY, AUGUST 14, 2025	
7:00AM - 8:00AM Westin Pittsburgh	5KM FUN RUN Join other attendees in the lobby of the Westin Pittsburgh for a fun community run! A rough 5km out and back run through Pittsburgh will get you ready for the day of science!
9:00AM - 10:30AM Ballroom A	S1: The importance of advocacy in biomedical engineering research Karen Troy ¹ , Dawn Beraud ² , Jill Higginson ³ , Katherine Saul ⁴ ¹ Worcester Polytechnic Institute, ² AIMBE, ³ University of Delaware, ⁴ North Carolina State University
Room 317/318	S2: Neuromechanics in action: Integrating the neural control and biomechanics of walking Sarah Roelker ¹ , Nidhi Seethapathi ² , Daniel Ferris ³ , Jessica Allen ³ , Michael Rosenberg ⁴ , Gelsy Torres-Oviedo ⁵ ¹ University of Massachusetts Amherst, ² Massachusetts Institute of Technology, ³ University of Florida, ⁴ Emory University, ⁵ University of Pittsburgh
Room 310/311	O1.1: Osteoarthritis from thumb to ankle Chairs: Michael Samaan and Skylar Holmes O1.1.1: The impact of carpometacarpal osteoarthritis on thumb-tip force, movement-evoked pain, and self-reported disability Troy Kelly Jr ¹ , Benjamin Nowak ¹ , Alexis Benoit ¹ , Jessica Molina ¹ , Victor Akpaloo ¹ , Jennifer Nichols ¹ ¹ University of Florida O1.1.2: The relationship between 3D scapular morphology and glenohumeral osteoarthritis Rebekah Lawrence ¹ , Lindsey Kahan ¹ , Jay Keener ¹ , Alexander Aleem ¹ , Benjamin Zmistowski ¹ ¹ Washington University School of Medicine

Room 310/311

O1.1.3: Muscle and adipose elastic modulus following elective total hip arthroplasty

Alyssa Tondat¹, Emiko Arshad¹, Sheryl Bourgaize², Marina Mourtzakis¹, Tina Mah³, Matthew Snider⁴, Paul Grosso⁴, Brandon Girardi⁴, Oliver Gauthier-Kwan⁴, Stephanie Nemirov⁴, Carla Girolametto⁴, Kailyn Clarke⁴, Andrew Laing¹

¹ University of Waterloo, ² Cape Breton University, ³ Schlegel-University of Waterloo Research Institute for Aging, ⁴ Grand River Hospital

O1.1.4: Biofeedback modifies lower extremity loading without increased pain in patients with knee osteoarthritis

Elizabeth Bjornsen¹, Todd Schwartz¹, Brian Pietrosimone¹, Jason Franz²

¹ University of North Carolina at Chapel Hill, ² North Carolina State University

O1.1.5: Loading asymmetry persists despite physical activity and symmetry intervention after total knee arthroplasty

Renoa Choudhury¹, Liubov Arbeeva², Carla Hill², Katie Huffman², Todd Schwartz², Kelli Allen², Robin Queen¹

¹ Virginia Polytechnic Institute and State University, ² University of North Carolina at Chapel Hill

O1.1.6: Effects of age and lateral ankle sprain history on talar cartilage characteristics

Amin Mohammadi¹, Ryan Mccann¹

¹ Old Dominion University

Room 319/320

O1.2: Advances in Biomechanics with the Power of AI & ML

Chairs: Matty Major and Ke Song

O1.2.1: Personalized exoskeleton control for optimizing gait economy in stroke survivors

Daniel Rodriguez-Jorge¹, Gregory Sawicki¹, Aaron Young¹

¹ Georgia Institute of Technology

O1.2.2: Automatic segmentation of abductor hallucis in ultrasound images: Development of deep neural networks

Halime Gulle¹, Furkan Mumcu¹, Austin Goodrich², Lokman Bekit¹, Wayne Johnson², Yasin Yilmaz¹, Irene Davis³

¹ University of South Florida, ² Brigham Young University, ³ University of South Florida, Tampa, FL

O1.2.3: Neural network for reconstruction of intact tibia shapes from post-fracture bone CT scans

Alireza Ariyanfar¹, Hannah Dailey¹

¹ Lehigh University

Room 319/320

O1.2.4: Downhill walking classification for gait-assistive wearable robot: a machine learning and deep learning approachChihyeong Lee¹, Eunsik Choi¹, Minhye Kim¹, Joeeun Ahn¹¹ Seoul National University**O1.2.5: Deep learning biological state estimation enables joint work optimization across tasks**Matthew Lerner¹, Ethan Schonhaut¹, Aaron Young¹¹ Georgia Institute of Technology**O1.2.6: Gait differences in ACL injuries: Machine learning for uncovering patient clusters² years after reconstruction**Jingyu Hu¹¹ University of Hawaii at Manoa

Room 315/316

THEMATIC 1: Exoskeletons in Gait

Chairs: Meghan Huber and Phillip Malcolm

T1.1: Data-driven deep learning of human biology enables task agnostic control for wearable robotsAaron Young¹, Dean Molinaro¹, Keaton Scherpereel¹¹ Georgia Institute of Technology**T1.2: Soft exosuit reduces freezing-of-gait in an individual with Parkinson's disease by applying bilateral hip flexion assistance during personalized hotspot**Sukirat Bhullar¹¹ Research Fellow**T1.3: Neural adaptation to exoskeleton assistance during walking**Banu Abdikadirova¹¹ University of Massachusetts Amherst**T1.4: Kinematic coupling relationships between hip and knee joints when walking with a hip exoskeleton**Chihyeong Lee¹, Hyeonwoo Kim¹, Chae Lynne Kim¹, Joeeun Ahn¹, Keewon Kim¹, Yujin Kwon¹¹ Seoul National University

Room 315/316	<p>T1.5: Quantitative and qualitative effects of biological torque assistance parameters using a hip exoskeleton during decline walking</p> <p>Jelovy Djaja¹, Katherine Peterka¹, Keya Ghonasgi², Aaron Young¹ ¹ Georgia Institute of Technology, ² Rice University</p> <p>T1.6: The effects of ankle exoskeleton assistance on gait capacity in younger adults</p> <p>Ethan Simaitis¹, Oluranti Olatosi¹, Michael Lewek¹, Jason Franz² ¹ University of North Carolina at Chapel Hill, ² North Carolina State University</p>
10:30AM - 11:00AM Ballroom BC	<p>COFFEE BREAK</p> <p>Sponsored by University of Pittsburgh</p> <div>  <div> <p>University of Pittsburgh.</p> </div> <div> <p>Swanson School of Engineering Bioengineering</p> </div> </div>
11:00AM - 11:15AM Ballroom A	ANNOUNCEMENTS
11:15AM - 12:15PM Exhibit Hall A	<p>KEYNOTE LECTURE 1</p> <p><i>Forging a new future with people with disabilities</i></p> <p>Rory Cooper, University of Pittsburgh and US Department of Veterans Affairs</p>
12:15PM - 1:45PM Ballroom BC	<p>LUNCH</p> <p>Grab some lunch, visit an exhibitor, and network with other attendees!</p>
Room 301/302/303	<p>MENTOR/MENTEE LUNCH</p> <p>Pre-registration required. Meet with your mentor over a casual lunch.</p>
Room 310/311	<p>AFFINITY GROUP</p> <p>ASB CHRISTIAN BIOMECHANICS</p>
1:45PM - 2:45PM Ballroom A	<p>AWARD LECTURES</p> <p>Chairs: Virginia Liang, Josh Baxter, and David Lipps</p> <p>PRE-DOCTORAL ACHIEVEMENT AWARD</p> <p>Soyong Shin, Carnegie Mellon University</p> <p>EARLY CAREER ACHIEVEMENT AWARD</p> <p>Scott Uhlich, University of Utah</p> <p>UP AND COMER 2024</p> <p>Caitlin Banks, Johns Hopkins University</p> <p>Kinyata Cooper, University of Florida</p>

Room 317/318

3 MINUTE THESIS COMPETITION

Chairs: **Andy Karduna** and **Max Diaz**

Join us to hear from the 3MT competitors!

3:00PM - 4:30PM

Ballroom A

O2.1: *Baseball biomechanics from the mound to the box*

Chairs: **Brian Knarr** and **Antonia Zaferiou**

O2.1.1: *Forearm flexor muscle strength & elbow joint gap changes when utilizing FlexPro Grip*

Jessica Geiger¹, Blake Jones¹, Brett Pexa², Kristen Nicholson¹

¹ Wake Forest University School of Medicine, ² High Point University

O2.1.2: *Ground reaction forces and pitch velocity: A comparative study of youth and professional baseball pitchers*

Zyanya Burgos Resendiz¹

¹ University of Denver

O2.1.3: *Pitchers show bilateral lower extremity neuromuscular decline in a simulated baseball game: A RMS analysis*

Thomas Demirjian¹, Adam Barrack², Jeremy Praski³, Zachary Domire¹, Nicholas Murray¹

¹ East Carolina University, ² University of Southern California, ³ University of Tennessee

O2.1.4: *"An ounce of prevention": How increasing ball weight and size decrease elbow varus torque in baseball pitching*

Glenn Fleisig¹, Jonathan Slowik¹, Brad Hall¹, David Beason¹, Lyle Cain¹

¹ American Sports Medicine Institute

O2.1.5: *Segmental contribution to whole-body angular momentum in baseball pitching*

Jun Liu¹, Christopher Knowlton², Mathew Gauthier³, Zach Tropp⁴, Nikhil Verma⁴, Gregory Nicholson⁴, Anthony Romeo⁵, Antonia Zaferiou¹

¹ Stevens Institute of Technology, ² Rush University Medical Center, ³ University of Illinois at Chicago, ⁴ Rush University, ⁵ Midwest Orthopaedic

O2.1.6: *Comparing the performance of modern collegiate non-wood baseball bats to historic wood bat data*

Joseph Crisco¹, Amy Morton¹, Kristen Nicholson², Richard Greenwald³

¹ Brown University, ² Wake Forest University School of Medicine, ³ Dartmouth College

Room 317/318 **02.2: Back to basics: Measuring mechanics of skeletal muscle**

Chairs: Carrie Peterson and Alex Reiter

02.2.1: Effects of passive stretching on muscle-tendon unit viscoelasticity

Skylar Taylor¹, Kristen Jakubowski², Madison Gaines¹, Young-Hui Chang³, Gregory Sawicki³

¹ Undergraduate Student, ² Emory University, ³ Georgia Institute of Technology

02.2.2: Defining the relationship between tear severity and mechanical properties in a rabbit muscle-tendon unit

Kathryn Rex¹, Joshua Pataky¹, Zoe Moore¹, Meghan Vidt¹

¹ Pennsylvania State University

02.2.3: Investigating the role of fat infiltration patterns on mechanical strain in facioscapulohumeral dystrophy

Kimberly Steininger¹, Allison McCrady¹, Seth Friedman², Silvia Blemker¹

¹ University of Virginia, ² Seattle Children's Hospital

02.2.4: In-vivo human gracilis muscle active force-length relationship is explained by the sliding filament theory

Zheng Wang¹, Lomas Persad¹, Benjamin Binder-Markey², Ernest Hoffman¹, William Litchy¹, Alexander Shin¹, Kenton Kaufman¹, Richard Lieber³

¹ Mayo Clinic, ² Drexel University, ³ Shirley Ryan AbilityLab

02.2.5: Increased tendon compliance can increase muscle power and work output

David Lin¹, Austin Au¹, Bertrand Tanner¹

¹ Washington State University

02.2.6: Measuring whole and sectioned skeletal muscle stiffness with microindentation

Benjamin Wheatley¹, Gianni Valentine¹

¹ Bucknell University

Room 319/320 **02.3: Slips, Trips, and Falls**Chairs: **Erika Pliner** and **Michelle Harter****02.3.1: Effects of tripping types and repetitions on reactive balance control during walking and carrying tasks****Ling Li¹, Kaden Valkenburg², Ben Geske², Carly Palmer², Boyi Dai³**¹ College of Idaho, ² University of Wyoming, ³ University of Vermont**02.3.2: Ankle and hip muscle activation in response to ground slide perturbations****Theresa Hardin¹, Aaron Young¹, Gregory Sawicki¹, Jennifer Leestma¹**¹ Georgia Institute of Technology**02.3.3: Reactive stepping responses to lateral perturbations in individuals with transfemoral amputation****Hiva Razavi¹, Kristin Perrin², Boer Chen², Kayla Russell-Bertucci², Noah Rosenblatt³, Deanna Gates²**¹ University of Michigan - Ann Arbor, ² University of Michigan, ³ Rosalind Franklin University of Medicine**02.3.4: Goal-directed lateral stepping sheds light on muscle coordination strategies in walking balance challenges****Grant Maddox¹, Andrew Shelton², Vicki Mercer², Jeremy Crenshaw³, Jason Franz⁴, Jessica Allen¹**¹ University of Florida, ² University of North Carolina at Chapel Hill, ³ University of Delaware, ⁴ North Carolina State University**02.3.5: Shoe-rung coefficient of friction as a predictor of slips in ladder climbing****Violet Williams¹, Sarah Griffin¹, Richard Smith¹, Jaspreet Chera¹, Mark Redfern¹, Kurt Beschoner¹**¹ University of Pittsburgh**02.3.6: Preliminary design and validation of the Glidiator: a novel means of eliciting unexpected and repeated large amplitude slips****Gaspard Diotalevi¹, Chantal Gauvin², Denis Rancourt¹, Cécile Smeesters¹**¹ Université de Sherbrooke, ² Institut de recherche Robert-Sauvé en santé et en sécurité du travail

Room 315/316

THEMATIC 2: *Wearables for detection and rehabilitation*

Chairs: Matthew Sunil Varre and Inseung Kang

T2.1: *Musical feedback for gait retraining in orthopedic rehabilitation*

Luisa Cedin¹, Camilla Antognini¹, Christopher Ferrigno¹, Christopher Knowlton¹, Markus Wimmer¹

¹ Rush University Medical Center

T2.2: *Estimating metabolic energy cost using wearable sensors*

Katherine Butler¹, Rachel Vitali¹

¹ University of Iowa

T2.3: *Accuracy of a tibial mounted accelerometer at identifying take-off and landing of a single-legged vertical jump*

Jean Mccrory¹, Millissia Murro², Marcus Marpoe¹, Matthew Fleshman¹, Michelle Sandrey¹

¹ West Virginia University, ² University of Delaware

T2.4: *How much insole sensor data is enough to identify habitual Achilles tendon loading?*

Ke Song¹, Michelle Kwon¹, Andy Smith², Ryan Pohlig², Karin Grävare Silbernagel², Josh Baxter¹

¹ University of Pennsylvania, ² University of Delaware

T2.5: *Arm movement in reaction to emotional stimuli reveal potential biomarker for childhood mental health diagnoses*

Jenna Cohen¹, Bryn Loftness², Julia Halvorson-Phelan³, Ellen McGinnis⁴, Ryan McGinnis⁴

¹ University of Vermont, ² University of Vermont, ³ Larner College of Medicine, ⁴ Wake Forest University School of Medicine

T2.6: *Detecting shoulder range of motion changes following breast reconstruction using a novel smartphone app*

Kayla Russell-Bertucci¹

¹ University of Michigan

4:30PM - 6:30PM

Ballroom BC

POSTER SESSION 1 & EXHIBITORS

6:30PM - 8:00PM

Room

301/302/303

WOMEN IN SCIENCE EVENT

Please note, pre-registration is required

Sponsored by novel electronics inc



7:30PM - 9:00PM Offsite	LGTBQIA+ SOCIAL
7:30PM - 9:00PM The Eagle - Pittsburgh 737 Penn Ave	ORTHOPAEDIC BIOMECHANICS INTEREST GROUP SOCIAL
7:00PM - 10:00PM Coop de Ville 2305 Smallman St	BBA & LIB SOCIAL

FRIDAY, AUGUST 15, 2025

7:00AM - 8:00AM Room 301/302/303	FELLOWS BREAKFAST Invite only. Join the Council of Fellows for a breakfast meeting
8:00AM - 9:30AM Ballroom A	DEBATE: <i>The essential capabilities and knowledge exists in biomechanics to draw meaningful insights from big data: For or against?</i> Scott Selbie¹, Katherine Boyer², Janie Wilson³ ¹ Has-Motion Inc, ² University of Massachusetts Amherst, ³ Dalhousie University
Room 317/318	S3: <i>Advancing our understanding of the biomechanics of real-world wheelchair use: Perspectives, tools, and innovations for improving health and quality of life</i> Melissa Morrow¹, Stephen Cain², Omid Jahanian³, Kerri Morgan⁴, Shivayogi Hiremath⁵, Rachel Cowan⁶, Dan Ding⁷ ¹ University Medical Branch Texas, ² West Virginia University, ³ Mayo Clinic, ⁴ Washington University in St. Louis, ⁵ Temple University, ⁶ University of Alabama at Birmingham, ⁷ University of Pittsburgh
Room 319/320	03.1: "Seeing" inside the body: Imaging technology for data collection Chairs: Daniel Ferris and Timothy Lowe 03.1.1: <i>Stepping into the flow: Mechanical work influences walking-induced hyperemia</i> Jose Anguiano-Hernandez¹, Jenna Burnett¹, Cody Anderson², Song-Young Park², Kota Takahashi¹ ¹ University of Utah, ² University of Nebraska at Omaha 03.1.2: <i>Not all muscles are created equal: exploring torque density, a measure of muscle torque generating efficiency</i> Mario Garcia¹, Emily McCain¹, Xiao Hu¹, Shawn Russell¹, Silvia Blemker¹ ¹ University of Virginia

Room 319/320

03.1.3: The impact of manual wheelchair use during childhood and adolescence on shoulder joint complex muscle elasticityDenali Hutzelmann¹, Colleen Vogel¹, Savanna Rudy¹, Heath Henninger², Joshua Leonardis³¹ University of Illinois at Urbana-Champaign, ² University of Utah, ³ University of Illinois**03.1.4: Leveraging Ultrasound Imaging to personalize musculoskeletal thumb models**Victor Akpaloo¹, Alexis Benoit¹, Jennifer Nichols¹¹ University of Florida**03.1.5: Clinical application of virtual mechanical testing of tibial fracture healing and nonunion**Mehran Bahrami¹, Hannah Dailey¹¹ Lehigh University**03.1.6: Patellofemoral joint stress is associated with cartilage composition seven years after anterior cruciate ligament reconstruction**Riley Starr¹, Richard Magony¹, Dianne Bryant¹, Alan Getgood¹, Derek Pamukoff¹¹ Western University

Room 315/316

THEMATIC 3: The "Other things" that influence balance

Chairs: James Finley and Jessica Allen

T3.1: Transient sadness is associated with altered gait and balance in people with glaucomaNatalie Bick¹, Helmet Karim¹, Howard Aizenstein¹, Mark Redfern¹, Subashan Perera¹, Rakie Cham¹¹ University of Pittsburgh**T3.2: Changes in posture of clinicians during VR interactions designed to elicit implicit biases**Thomas Rossi¹, Connor Delaney¹, Samuel Acuña¹¹ George Mason University**T3.3: Visual context affects lateral stepping regulation on winding paths**Anna Render¹, Tarkeshwar Singh¹, Joseph Cusumano¹, Jonathan Dingwell¹¹ Pennsylvania State University

Room 315/316	<p>T3.4: Influence of threat-induced anxiety on muscle coordination between upper and lower limbs during reactive balance</p> <p>Anke Hua¹, Katherine Dudek¹, Kelly Westlake¹ ¹ University of Maryland, Baltimore</p> <p>T3.5: How do individuals with chronic stroke adapt walking balance control to task demands?</p> <p>Grace Kellaher¹, Elisa Arch¹, Jason Franz², Darcy Reisman¹, Jeremy Crenshaw¹ ¹ University of Delaware, ² North Carolina State University</p> <p>T3.6: The impact of dog walking on gait kinematics and variability</p> <p>Alex Peebles¹, Michael Bennett¹, Samantha Morrison¹, Ji Chen¹, Lara Thompson¹ ¹ University of The District of Columbia</p>
9:30AM - 10:00AM Ballroom BC	<p>COFFEE BREAK</p> <p>Sponsored by University of Pittsburgh</p> <div>  <div>University of Pittsburgh</div> </div> <div>  </div>
10:00AM - 10:15AM Ballroom A	ANNOUNCEMENTS
10:15AM - 11:15AM Ballroom A	<p>KEYNOTE LECTURE 2</p> <p><i>Transforming clinical care of damaged knees: The critical role of MD-PhD partnerships</i></p> <p>Suzanne Maher, Hospital for Special Surgery</p>
11:15AM - 12:45AM Ballroom BC	<p>LUNCH</p> <p>Grab your lunch, visit an exhibitor, and network with other attendees!</p>
Room 301/302/303	<p>COMMUNITY LUNCH (previously Diversity Lunch)</p> <p>Open to anyone interested. Grab your lunch and make your way to the lunch session.</p>
Room 310/311	<p>AFFINITY GROUP</p> <p>AMERICAN BASEBALL BIOMECHANICS SOCIETY ANNUAL BUSINESS MEETING</p>

<p>12:45PM - 14:15PM Ballroom A</p>	<p>AWARDS SESSION</p> <p>Chairs: Erin Mannen and Brian Davis</p> <p><i>Goel award for translational research in biomechanics</i> Josh Caputo, Humotech</p> <p><i>Founders' award</i> Peter Adamczyk, University of Wisconsin-Madison</p> <p><i>Jean Landa Pytel Award for Diversity mentorship in biomechanics award</i> Brooke Odle, Hope College</p>
<p>Room 317/318</p>	<p>O4.1: Locomotion: Maneuverability and coordination</p> <p>Chairs: Jaimie Roper and Frankie Wade</p> <p>O4.1.1: Effects of asymmetric surface stiffness walking on weight bearing and lower limb muscle excitation symmetry Elena Schell¹, Jonaz Moreno¹, Leah Metsker¹, Jenna Chiasson¹, Meghan Huber¹, Mark Price¹, Wouter Hoogkamer¹ ¹ University of Massachusetts Amherst</p> <p>O4.1.2: Heads up! Altered head movement in walking tasks in people with glaucoma Michelle Harter¹, Galen Holland¹, Amanda Bicket², Mark Redfern¹, Rakie Cham¹ ¹ University of Pittsburgh, ² University of Michigan</p> <p>O4.1.3: Long-term adaptation in step width and short-term adaptation in stepping coordination Corbin Rasmussen¹, Nathaniel Hunt², Seongwoo Mun² ¹ Creighton University, ² University of Nebraska at Omaha</p> <p>O4.1.4: The effects of walking speed on multi-segment foot rigidity and coordination Megan Weaver¹, Ross Smith², Shyam Patel³, Kota Takahashi⁴, Jason Franz⁵ ¹ University of North Carolina at Chapel Hill, ² University of North Carolina, ³ University of North Carolina at Chapel Hill & North Carolina State University, ⁴ University of Utah, ⁵ North Carolina State University</p> <p>O4.1.5: Quantifying predictive and reactive control strategies during stepping maneuvers Allison Kenney¹, Francis Grover¹, Anna Shafer², Keith Gordon¹ ¹ Northwestern University, ² Edward Hines Jr. Veterans Affairs Hospital</p> <p>O4.1.6: Human brain and body dynamics during visual tracking and stepping over virtual objects Andrew Nordin¹, Yu-Po Cheng² ¹ University of Houston, ² Texas A&M University</p>

THEMATIC 4: *Knee deep in ACL reconstruction biomechanics*Chairs: **Stephanie DiStasi** and **Stephanie Cone****T4.1: *Sagittal plane moment and impulse¹ month post-ACL reconstruction are associated with cartilage degeneration¹ 2 months post-ACL reconstruction*****Justin Dennis¹, Alex Edison², Thomas Birchmeier¹, Troy Blackburn¹**¹ University of North Carolina at Chapel Hill, ² University of Kentucky**T4.2: *Arthrokinematics analysis of high impact and large rotation activities 1–2 years post-ACLR+M*****Sadegh Khodabandeloo¹**¹ University of Vermont**T4.3: *Sex-based variations in meniscal morphology and contact mechanics follow ACL reconstruction*****Dominique Barnes¹, Crystal Murray¹, Mohammadreza Movahhedi², Ata Kiapour², Jillian Beveridge³, Martha Murray², Braden Fleming¹**¹ Brown University, ² Boston's Children Hospital, ³ Brown University Health**T4.4: *Comparison of musculoskeletal modeling methods to estimate tibiofemoral contact force in individuals post-ACL reconstruction*****Willa Ma¹, Russell Johnson², Susan Sigward¹**¹ University of Southern California, ² Northwestern University**T4.5: *Impact of targeted neuromuscular training on clinical performance testing in athletes returning to sport after ACL reconstruction*****Nathaniel Bates¹**¹ Ohio State University**T4.6: *Adolescent athletes post-ACL reconstruction demonstrate gender and limb differences in strut and spring behaviors*****Katelyn Campbell¹, Sierra Hastings¹, Eric Dugan¹**¹ Texas Children's Hospital

2:30PM - 4:00PM
Ballroom A

AWARDS TALK: *Journal of Biomechanics and Clinical Biomechanics Awards*

Chairs: **Matty Major** and **David Lipps**

AS1.1: Reconstruction of articular joints using implanted compliant mechanisms

Brandon Peterson¹, Jonathan Hopkins¹, Nelson Soohoo¹, Tyler Clites¹

¹ University of California, Los Angeles

AS1.2: The effect of optical flow perturbations on walking foot placement control in people with multiple sclerosis

Kavya Katugam-Dechene¹, Irena Dujmovic Basuroski², Brian Selgrade³, Jacob Sosnoff⁴, Jason Franz⁵

¹ University of North Carolina at Chapel Hill, ² University of North Carolina School of Medicine, ³ Westfield State University, ⁴ University of Kansas Medical Center, ⁵ North Carolina State University

AS1.3: Limb lengthening: slower distraction rates may improve joint recovery

Hui Tang¹, John Heydemann², Niamh McMahon², Kevin Mchorse², Kathleen Rickert², Owen Beck¹

¹ University of Texas at Austin, ² Central Texas Pediatric Orthopedics

AS1.4: Isolated plantar flexor stimulation exposes Achilles subtendon sliding

Kathryn Strand¹, Todd Hullfish¹, Maggie Wagner¹, Josh Baxter¹

¹ University of Pennsylvania

AS1.5: The effect of carbon fiber insoles on foot-ankle mechanical leverage and vulnerability to walking balance perturbations

Aubrey Gray¹, Kabir Dewan¹, Kota Takahashi², Jason Franz³

¹ University of North Carolina at Chapel Hill & North Carolina State University,

² Department of Health & Kinesiology, University of Utah, ³ North Carolina State University

AS1.6: Locomotor adaptation control shifts from the brain to the spinal cord with practice

Nikhil Madaka¹, Shuqi Liu¹, Nathan Brantly¹, Theodore Huppert¹, Douglas Weber², Hartmut Geyer², Gelsy Torres-Oviedo¹


¹ University of Pittsburgh, ² Carnegie Mellon University

Room 317/318

05.1: Rehabilitation interventionsChairs: **Tamara Bush** and **Jack Williams****05.1.1: The effects of a visual disruptive task on walking gait biomechanics in those with anterior cruciate ligament reconstruction**Alex Edison¹, Justin Dennis², Thomas Birchmeier², Troy Blackburn²¹ University of Kentucky, ² University of North Carolina at Chapel Hill**05.1.2: Effects of water weight-induced perturbation on gait characteristics**Malicki Diallo¹, Nicholas Tom², Shawanee Patrick², Ajit Chaudhari²¹ University of Massachusetts, ² The Ohio State University**05.1.3: Impact of arm dominance and practice type on movement task performance post spinal cord injury**Rebekah Revadelo¹, Skyler Barclay¹, Andrew Hill¹, Trent Brown¹, Allison Kinney¹, Timothy Reissman¹, Megan Reissman¹¹ University of Dayton**05.1.4: Strength imbalances and shoulder pain in manual wheelchair users stratified by age of spinal cord injury/disease onset**Carrie Peterson¹, Brooke Slavens², Ashlyn Jones¹, Alyssa Schnorenberg²¹ Virginia Commonwealth University, ² University of Wisconsin – Milwaukee**05.1.5: Shoulder and wrist intralimb joint coordination are age and trial dependent**Robyn Hansen¹, Sara Arena¹, Robin Queen¹¹ Virginia Polytechnic Institute and State University**05.1.6: Self-adaptive passive hand exoskeleton (SPHEX) for home-based training**Sang Wook Lee¹, Thanh Phan²¹ Catholic University of America, ² University of Maryland, Baltimore

Room 319/320

05.2: Gait and cognitionChairs: **Doug Martini** and **Jenna Yentes****05.2.1: Age-specific adaptations to mental fatigue in dual-task walking of varying complexity****Hang Qu¹, Jinfeng Li², Tim Derrick², Li-Shan Chou³**¹ University of Florida, ² Iowa State University, ³ Purdue University**05.2.2: Dual-task reactive balance control in older adults with mild cognitive impairment: The effect of cognitive task domain on cognitive-motor interference****Jessica Pitts¹, Lakshmi Kannan¹, Tony Szturm², Tanvi Bhatt¹**¹ University of Illinois at Chicago, ² University of Manitoba**05.2.3: Impact of mild cognitive impairment on dynamic gait stability in older adults during overground walking****Caroline Simpkins¹, Sara Mahmoudzadeh Khalili¹, Diane' Brown¹, Jiyun Ahn¹, Feng Yang¹**¹ Georgia State University**05.2.4: Does adding a secondary task while walking alter margin of stability?****Douglas Mitchell¹, Frankie Wade¹**¹ San Diego State University**05.2.5: Modeling brain connectivity as a mediator of dual-task performance: pilot work****John Manning¹, Jenna Yentes¹**¹ Texas A&M University**05.2.6: Canonical correlation analysis of motor function and cognition****Haley Hentnik¹, Christine Phillips¹, Abigail Stephan¹, Lesley Ross¹, Reed Gurchiek¹**¹ Clemson University

Room 315/316	<p>THEMATIC 5: AI & ML for biomechanics and clinical predictions</p> <p>Chairs: Anne Martin and Michael Rosenberg</p> <p>T5.1: Sex-based machine learning models for prediction of abdominal aortic aneurysm patient outcomes</p> <p>Katherine Kerr¹, Indrani Sen², Pete Guelnder³, Tiziano Tallarita², Joseph Wildenberg², Nathan Liang⁴, David Vorp³, Timothy Chung⁵</p> <p>¹ University of Pittsburgh, ² Mayo Clinic, ³ Department of Bioengineering, ⁴ University of Pittsburgh Medical Center, ⁵ Clinical and Translational Sciences Institute</p> <p>T5.2: Generalizable deep learning model enables prediction of future physiological states during perturbed locomotion</p> <p>Sofia Arvelo Rojas¹, Jennifer Leestma¹, Gregory Sawicki¹, Aaron Young¹</p> <p>¹ Georgia Institute of Technology</p> <p>T5.3: A hybrid machine learning and physics-based simulation approach for predicting musculoskeletal forces from video-based kinematics</p> <p>Emily Miller¹</p> <p>¹ University of Utah</p> <p>T5.4: A machine-learning based, kirigami-inspired shoulder patch accurately predicts shoulder elevation angles</p> <p>Amani Alkayyali¹, Max Shtein¹, David Lipps¹</p> <p>¹ University of Michigan</p> <p>T5.5: Evaluating post-stroke upper extremity impairments with pose estimation</p> <p>Kaleb Burch¹</p> <p>¹ Johns Hopkins University</p> <p>T5.6: Personalized musculoskeletal hand models: should we strive for anatomic accuracy, prediction accuracy, or both?</p> <p>Maximillian Diaz¹, Erica Lindbeck¹, Joel Harley¹, Jennifer Nichols¹</p> <p>¹ University of Florida</p>
4:00PM - 6:00PM Ballroom BC	POSTER SESSION 2 & EXHIBITORS
5:00PM - 6:00PM Room 315/316	JOB MARKET POSTER SESSION
7:00PM - 9:00PM Rooftop	<p>BANQUET DINNER</p> <p>Pre-registration required</p> <p>Sponsored by University of Pittsburgh</p> <div>  <div> <p>University of Pittsburgh.</p> </div> <div> <p>Swanson School of Engineering Bioengineering</p> </div> </div>

SATURDAY, AUGUST 16, 2025

8:00AM - 9:30AM
Ballroom A**06.1: Neuromuscular changes with age**

Chairs: Kota Takahashi and Gu Eon Kang

06.1.1: Aging adults with hip osteoarthritis walk with altered lower extremity joint powerAmara Sharp¹, Kate Jochimsen², Aaron Fain¹, Anthony Mangino¹, Stephen Duncan¹, Jaimie Roper³, Michael Samaan¹¹ University of Kentucky, ² Massachusetts General Hospital & Harvard Medical School,³ Auburn University**06.1.2: Soleus functional electrical stimulation attenuates older adult distal-to-proximal redistribution during walking**Ningzhen Zhao¹, Lisa Griffin², Owen Beck¹¹ University of Texas at Austin, ² Movement and Cognitive Rehabilitation Science**06.1.3: Age explains a significant portion of the increase in lateral gastrocnemius shearwave velocity during passive stretching**Andrew Sawers¹, Daniel Ludvig², Paige Cordts², Eric Perreault²¹ University of Illinois at Chicago, ² Northwestern University**06.1.4: Older adults fail to modulate muscle excitations in anticipation of walking balance perturbations**Emily Eichenlaub¹, Jessica Allen², Vicki Mercer¹, Jeremy Crenshaw³, Jason Franz⁴¹ University of North Carolina at Chapel Hill, ² University of Florida, ³ University of Delaware, ⁴ North Carolina State University**06.1.5: Lower-limb joint kinetics of older adults during turning gait**Erin Kreis¹, Zahava Hirsch¹, Jun Liu¹, Antonia Zaferiou¹¹ Stevens Institute of Technology**06.1.6: Older adults walk with a less efficient step-to-step transition (STST) than young adults and modulate STST timing to achieve higher efficiency at faster speeds.**Elham Alijanpour¹, Daniel Russell²¹ Old Dominion University, ² Ellmer College of Health Sciences

Room 317/318

06.2: Ergonomics: Where biomechanics meets the real world

Chairs: Michael Madigan and Fabricio Saucedo

06.2.1: A comparative study of glove use on carpal tunnel pressure relief during manual wheelchair operation: a pilot studyKathleen Olmstead¹, Wendy Reffeor¹, Jeanine Beasley¹, Yunju Lee¹¹ Grand Valley State University**06.2.2: Investigating the relationship between lower extremity kinematics and lumbar joint moments during initial ground impact of military parachute jumping tasks**Felicia Davenport¹, Jazmin Cruz², Peter Le²¹ Georgia Institute of Technology, ² Air Force Research Laboratories (ORISE)**06.2.3: Personalized muscle strength modeling predicts larger joint contact impulses in military load carriage**Anna Corman¹, Pinata Sessoms², Jordan Sturdy¹, Hedaya Rizeq², Carlie Daquino², Tyler Whittier³, Amy Silder², Anne Silverman¹¹ Colorado School of Mines, ² Naval Health Research Center, ³ Montana State University**06.2.4: Feasibility testing of back exoskeletons for loads associated with patient transfers**Madeline Jenkins¹, Josh Riesenbergs¹, Jason Gillette¹¹ Iowa State University**06.2.5: It's not my fault! Rung kicking is associated with the ladder design and climbing task, not the person**Sarah Griffin¹, Violet Williams¹, Kurt Beschorner¹¹ University of Pittsburgh**06.2.6: Stroller running on hills: how terrain affects ground reaction forces**Joseph Mahoney¹, Teresa Reed², Amanda Mueller², Abby Miller², Allison Altman-Singles²¹ Alvernia University, ² Penn State Berks

Room 319/320 **06.3: Advances in prosthetics**

Chairs: Cara Welker and Tyler Clites

06.3.1: Assessing relationships between ankle-foot prosthesis stiffness, residuum-socket interface pressure, and socket comfort in unilateral transtibial prosthesis usersMichael Jacobson¹, Zachary Hoegberg², Ashutosh Tiwari¹, Michelle Sanchez¹, Kiley Armstrong², Myunghee Kim¹, Matthew Major²¹ University of Illinois at Chicago, ² Northwestern University**06.3.2: Intramuscular EMG and Regenerative Peripheral Nerve Interface (RPNI) signals improve intuitive prosthetic control of multi-grip hand and wrist prosthesis**Ziyad Emara¹, Mira Mutnick¹, Dylan Wallace¹, Cynthia Chestek¹, Paul Cederna¹, Deanna Gates¹¹ University of Michigan**06.3.3: Metabolic cost of walking is lower in high-functioning transfemoral prosthesis-users with bone-anchored prostheses vs. socket-based prostheses**Ross Miller¹, Gauri Desai², Jae Kun Shim³¹ University of Maryland, ² Stanford University, ³ University of Maryland, College Park**06.3.4: Transtibial prosthesis users exhibit different patterns of hip muscle co-contraction than controls in both their residual and intact limbs**Hannah Carey¹, Andrew Sawers¹¹ University of Illinois at Chicago**06.3.5: Transtibial prosthesis users are more fatigable than unimpaired adults**Julie Ferrell-Olson¹, Dan Junquera¹, Brian Hafner², Andrew Sawers¹¹ University of Illinois at Chicago, ² University of Washington**06.3.6: In-socket mechanics are associated with patient-reported comfort and function in individuals with transfemoral amputations**Paige Paulus¹, Tom Gale¹, Rishabh Shetty¹, Justin Elder¹, Yulia Yatsenko¹, Gina Mckernan¹, Goeran Fiedler¹, William Anderst¹¹ University of Pittsburgh

Room 315/316

THEMATIC 6: *Animal and comparative biomechanics*

Chairs: Chase Rock and Monica Daley

T6.1: *Passive mechanics of skeletal muscle demonstrate sexual dimorphisms*Timothy McGinley¹, Benjamin Binder-Markey¹¹ Drexel University**T6.2: *Shared signatures of foot placement control for stable locomotion across species***Antoine De Comite¹, Nidhi Seethapathi¹¹ Massachusetts Institute of Technology**T6.3: *In vivo estimates of shear properties in cat soleus muscle***Ridhi Sahani¹, Qifeng Wang¹, Hendrik Dewald¹, Amr Mahrous¹, Matthieu Chardon¹, Kenneth Shull¹, Daniel Ludvig¹, Eric Perreault¹¹ Northwestern University**T6.4: *Development of a small animal device for measuring in vivo muscle-tendon loading***Alex Reiter¹, Patrick Hinkle¹, Fuad Al Hasan Bin Enam¹, Koyal Garg¹¹ Saint Louis University**T6.5: *Peak stress and peak strain locations are different in a porcine Achilles tendon following application of biological loads***Zoe Moore¹, Christopher Curry¹, Jayden Weaber-Heagele¹, Julianna Simon¹, Meghan Vidt¹¹ Pennsylvania State University**T6.6: *The design of a bighorn sheep horn bioinspired impact mitigation system***Bryce Reimer¹, Benjamin Wheatley¹, Chiara Vessicchio¹¹ Bucknell University**9:30AM - 10:00AM**

Ballroom BC

COFFEE BREAK**10:00AM - 10:15AM**

Ballroom A

ANNOUNCEMENTS**10:15AM - 11:15AM**

Ballroom A

BORELLI LECTURE***Models, sensors, and the forces of motion***

Darryl Thelen, University of Wisconsin

11:15AM - 12:45PM Ballroom BC	LUNCH Grab your lunch, visit an exhibitor, and network with other attendees!
Room 301/302/303	PROFESSIONAL DEVELOPMENT ROUNDTABLES Everyone welcome
Room 310/311	TEACHING BIOMECHANICS INTEREST GROUP
Room 309	JOURNAL OF BIOMECHANICS EDITORIAL BOARD MEETING Invite only
12:45PM - 2:15PM Ballroom BC	HAY AWARD SYMPOSIUM <i>Engineered advances in sports safety and performance</i>
Room 317/318	07.1: Locomotion: Arms and trunk Chairs: Jonathan Lee-Confer and Karen Troy 07.1.1: Interlimb neural coupling during gait with coherence and directionality analysis using rhythmic haptic cueing in arm swing training Ines Khiyara ¹ , Babak Hejrati ¹ ¹ University of Maine 07.1.2: Vector coding quantifying whole-body coordination during functional mobility in pediatric cerebral palsy Guilherme Cesar ¹ , Ligia Mochida ¹ , David Williams ¹ , Clayton Wauneka ² , Kira Flanagan ¹ , Paulo Santiago ³ , Bruno Bedo ³ ¹ University of North Florida, ² Brooks Rehabilitation Hospital, ³ University of São Paulo 07.1.3: Effects of back muscle fatigue and modified trunk inertia on lumbar kinematics, kinetics, and muscle activity during walking Benjamin Sibson ¹ , Andrew Yegian ² , Ali Yawar ² , Daniel Lieberman ² ¹ Beth Israel Deaconess Medical Center, ² Harvard University 07.1.5: Gait biomechanics differ between transfemoral and transtibial amputations Nikou Nikoumanesh ¹ , Shraddha Sudhir ¹ , Kharm Foucher ² , Lindsay Hannigan ¹ ¹ University of Illinois at Chicago, ² University of Illinois, Chicago 07.1.6: How does hands-free stroller running affect the ground reaction force? Allison Altman-Singles ¹ , Naomi Fay ¹ , Amanda Mueller ¹ , Abby Miller ¹ , Teresa Reed ¹ , Joseph Mahoney ² ¹ Penn State Berks, ² Alvernia University

Room 319/320

07.2: Methods of biomechanics data collection and validationChairs: **Silvia Blemker** and **Sam Masters****07.2.1: Test-retest reliability of passive ankle quasi-stiffness in young able-bodied adults****Nicole Rendos¹, Jorjie Wilson², Kristen Jakubowski², Mark Lyle³, Trisha Kesar², Jason Franz⁴**¹ Florida Institute for Human and Machine Cognition, ² Emory University, ³ Emory University School of Medicine, ⁴ North Carolina State University**07.2.2: A generalized coherence framework for quantifying input contributions in multi-input biomechanical systems with correlated or uncorrelated inputs****Nolan Howes¹, Matthew Allen¹, Dario Farina², Steven Charles¹**¹ Brigham Young University, ² Imperial College London**07.2.3: Determining the efficacy of short-separation channels for fNIRS motion artifact correction****Alexandra Lynch¹, Ka'jean Tallette², Corey Pew¹, Keith Hutchison¹, Scott Monfort¹**¹ Montana State University, ² Howard University**07.2.4: Distal femur fracture displacement fields from weightbearing computed tomography****Eric Thorhauer¹, William D. Lack¹, Elmer Vazquez¹, Joseph Davis¹, Sam Nelson¹, Aerie Grantham², Scott Telfer¹, William Ledoux²**¹ University of Washington, ² VA Puget Sound**07.2.5: Markerless motion capture can reliably assess cervical and shoulder range of motion****Morgan Lamarre¹, Matin Jahani Jirsaraei¹, Yonathan Assefa², Abhishek Aher¹, Reihana Akhwand¹, Kirubel Tadesse¹, Yu-Lin Hsu¹, Seiyon Lee¹, William Rosenberger¹, Secili Destefano³, Jay Shah², Lynn Gerber¹, Siddhartha Sikdar¹, Samuel Acuña¹**¹ George Mason University, ² National Institutes of Health Clinical Center, ³ Optical Motion Physical Therapy**07.2.6: Accuracy of 2D video-based movement analysis tools for the study of human falls and impacts****Kitaek Lim¹, Junwoo Park¹, Seyoung Lee¹, Soyeon Yoon¹, Sungmin Chun¹, Donggeon Kim¹, Woochol Choi¹**¹ Yonsei University

Room 315/316

THEMATIC 7: Aging bodies: From biomechanics to physiology

Chairs: Katherine Boyer and Jason Franz

T7.1: Relationship between foot mechanical power and whole-body metabolic power in older and younger adultsChristopher Long¹, Daniel Davis¹, Jason Franz², Kota Takahashi¹¹ University of Utah, ² North Carolina State University**T7.2: Effects of passive stretch training on plantarflexor function and gait speed in patients with peripheral artery disease**Logan Faux-Dugan¹, Stephen Piazza¹¹ Pennsylvania State University**T7.3: Age-related changes in the biomechanics of the lowering phase of a push-up: Implications for arresting a forward fall**James Borrelli¹, Rebecca Go¹¹ Stevenson University**T7.4: The effects of incontinence type on balance in adult women**Sydney Lemley¹, Sarah Hudacheck¹, Haley Hartman¹, Marlee Scott¹, Robert Shapiro¹, Corrie Mancinelli¹, Omar Garcia¹, Jean Mccrory¹¹ West Virginia University**T7.5: Intraindividual variability in simple reaction time is associated with balance and falls in older cancer survivors**Colby Shores¹, Sarah Bell¹, Michael Hehir², Caterina Rosano¹, James Richardson³, Noah Kolb², Mark Redfern¹, Brendan McNeish³¹ University of Pittsburgh, ² University of Vermont, ³ University of Michigan**T7.6: Heart rate dynamics during motor function: a marker of frailty**Mohammad Hosseinalizadeh¹, Kübra Akbaş², Alexandria Jean Rufin², Nima Toosizadeh²¹ Rutgers School of Graduate Studies, ² Rutgers University

2:30PM - 4:00PM

Ballroom A

S4: Walk this way, reach that way: exchanges between upper- and lower-limb biomechanicsSteven Charles¹, Jennifer Nichols², Meghan Vidt³, Julia Choi², Amy Lenz⁴, Niccolo Fiorentino⁵¹ Brigham Young University, ² University of Florida, ³ Pennsylvania State University, ⁴ University of Utah, ⁵ University of Vermont

Room 317/318

S5: Integrating patients' lived experiences into your biomechanics researchSamuel Acuña¹, Andrew Sawers², Erica King¹, Ashlyn Jendro³¹ George Mason University, ² University of Illinois at Chicago, ³ University of Arkansas

Room 319/320

O8.1: Tread carefully: Unpacking running biomechanics

Chairs: Jean McCrory and Gauri Desai

O8.1.1: Shoe heel-toe drop affects running economyKaleigh Renninger¹, Owen Beck¹¹ University of Texas at Austin**O8.1.2: Determining the effectiveness of footwear as an intervention for plantar fasciitis in female recreational runners**Kristyne Wiegand¹¹ Eastern Washington University**O8.1.3: The influence of running cadence manipulation on knee cartilage deformation in distance runners**Ryan Evans¹, Harry Battersby¹, Tom Boers¹, Richard Willy², Derek Pamukoff¹¹ Western University, ² University of Montana**O8.1.4: Effect of running speed on limb coordination within the framework of the Uncontrolled Manifold analysis**Joelle Dick¹, Alena Grabowski², Young-Hui Chang¹¹ Georgia Institute of Technology, ² University of Colorado Boulder**O8.1.5: Effects of speed, load, and surface on tibial bending and stress**Thomas Wenzel¹, Eric Francis¹, Tyler Brown¹¹ Boise State University**O8.1.6: Biomechanical adaptations in runners with medial tibial stress syndrome and tibial stress fractures: a ground reaction force and load rate analysis**Ryan Nixon¹, Sharareh Sharififar¹, Matthew Martenson¹, Kevin Vincent¹, Heather Vincent¹¹ University of Florida

Room 315/316

THEMATIC 8: *Musculoskeletal modeling for clinical applications*

Chairs: BJ Fregley and Katie Knaus

T8.1: *Distal residual limb soft tissue stresses in transfemoral amputees are associated with modifiable prosthetic sockets geometry parameters*

Tom Gale¹, Paige Paulus¹, Goeran Fiedler¹, William Anderst¹

¹ University of Pittsburgh

T8.2: *Optimal powered ankle prosthesis torque profile to reduce knee joint loading during walking for individuals with unilateral transtibial amputations*

Eric Hu¹, Glenn Klute², Richard Neptune¹

¹ University of Texas at Austin, ² U.S. Department of Veterans Affairs

T8.3: *Glenohumeral secondary kinematics and joint contact during unloaded tasks: A simulation study*

Morgan Dalman¹, Katherine Saul¹

¹ North Carolina State University

T8.4: *The sensitivity of glenohumeral joint arthrokinematic variables to different calculation methods*

Stacey Chen¹, Marcie Harris-Hayes¹, Michael Harris¹, Rebekah Lawrence²

¹ Washington University in St. Louis, ² Washington University School of Medicine

T8.5: *Multiple, not single, recipient muscle tendon transfers accomplish everyday grasping tasks: a simulation study with application to post-SCI grasp-restorative procedures*

Oliver Garcia¹, Joseph Towles¹

¹ Swarthmore College

T8.6: *High-resolution neuromechanics of the human eyelid*

Jinyoung Kim¹, Ashley Shirriff¹, Jordan Cornwell¹, Ereni Delis¹, Sophia Wang¹, Daniel Rootman¹, Tyler Clites¹

¹ University of California, Los Angeles

4:15PM - 5:45PM

Ballroom A

BUSINESS MEETING

All are welcome to learn more about the society, including financials, membership, future plans, and more.

Poster Listings

SESSION 1

Thursday, August 14, 2025 4:30 PM – 6:30 PM

SESSION 2

Friday, August 15, 2025 4:00 PM – 6:00 PM

POSTER SESSION 1

Thursday, August 14, 2025

PS1 - 1 - Knee adduction moment, not muscle composition, predicts medial-to-lateral cartilage thickness ratio in individuals with knee osteoarthritis

Skylar Holmes¹, Akshay Chaudhari¹, Garry Gold¹, Anthony Gatti¹, Katherine Boyer²

¹ Stanford University, ² University of Massachusetts Amherst

PS1 - 2 - Older adults activate muscles earlier in response to activity

Millissia Murro¹, Fany Alvarado¹, Grace Kellaher¹, Nancy Nguyen¹, Mayumi Wagatsuma¹, Jeremy Crenshaw¹, Jocelyn Hafer¹

¹ University of Delaware

PS1 - 3 - Inequalities in diabetes-related foot amputations among U.S. adults

Ghazal Mashhadiagha¹, Brian Davis¹

¹ Cleveland State University

PS1 - 4 - Feasibility of community based biomechanics data collection in individuals with knee osteoarthritis

Ryan McCloskey¹, Alex Gruber², Sean Leapley¹, Heather Vincent¹, Kerry Costello¹

¹ University of Florida, ² University of Wisconsin

PS1 - 5 - Acceptability of community-based, markerless biomechanics data collection with individuals with knee osteoarthritis

Jenna Qualter¹, Kathryn Stofer¹, Ryan McCloskey¹, Heather Vincent¹, Kerry Costello¹

¹ University of Florida

PS1 - 6 - Determining the changes in gluteal muscle force requirements after gluteus maximus tendon transfer for hip abductor insufficiency

Madison Wissman¹, Cecilia Pascual-Garrido¹, Michael Harris¹

¹ Washington University in St. Louis

PS1 - 7 - Impact of increased respiratory load on prefrontal cortical activation under varying task complexities of trail-walking task

Alka Bishnoi¹, Manuel Hernandez²

¹ Kean University, ² University of Illinois at Urbana-Champaign

PS1 - 8 - Executive function predicts age-related redistribution of joint power from ankle to hip during gait

Kenneth Harrison¹, Brandon Peoples¹, Keven Santamaria-Guzman¹, Jaimie Roper¹

¹ Auburn University

PS1 - 9 - Gait variability changes in older adults with and without knee osteoarthritis with a prolonged walk

Skylar Holmes¹, Hunter Brierly², Jacob Thomas², Jane Kent², Katherine Boyer²

¹ Stanford University, ² University of Massachusetts Amherst

PS1 - 10 - The influence of gait variability on human odometry

Tyler Wiles¹, Alli Grunkemeyer¹, Nick Stergiou¹, Aaron Likens¹

¹ University of Nebraska at Omaha

PS1 - 12 - Ischemic preconditioning alters gait mechanics in patients with knee osteoarthritis

Shraddha Sudhir¹, Nikou Nikoumanesh², Steven Garcia¹, Kharm Foucher¹, Lindsay Hannigan¹

¹ University of Illinois at Chicago, ² University of Massachusetts Amherst

PS1 - 13 - Stiff-knee gait is associated with walking energetics and forward propulsion in persons with knee osteoarthritis

Steven Garcia¹, Ogundoyin Ogundiran¹, Joy Itodo², Oiza Peters¹, Paige Perry¹, Kharm Foucher¹

¹ University of Illinois at Chicago

PS1 - 14 - Detection of translational perturbations using lower-limb kinematics during locomotion

Maria Tagliaferri¹, Leonardo Campeggi¹, Owen Beck², Inseung Kang¹

¹ Carnegie Mellon University, ² University of Texas at Austin

PS1 - 15 - Age-related differences in the step-to-step control of foot placement during prolonged walking

Ethan Simaitis¹, Yujin Kwon², Jason Franz³

¹ University of North Carolina at Chapel Hill, ² Seoul National University, ³ North Carolina State University

PS1 - 16 - A closer look at thumb force measurement: are clinical tools overlooking key details?

Ryan Harth¹, Adam Chrzan¹, Tamara Bush¹

¹ Michigan State University

PS1 - 17 - Changes in an IMU-derived metric of joint power after a bout of activity

Fany Alvarado¹, Millissia Murro¹, Nancy Nguyen¹, Mayumi Wagatsuma¹, Grace Kellaher¹, Jeremy Crenshaw¹, Jocelyn Hafer¹

¹ University of Delaware

PS1 - 18 - Exploring a stick drop paradigm with a smartphone app for reaction time testing

Colby Shores¹, Mark Redfern¹, Brendan McNeish²

¹ University of Pittsburgh, ² University of Michigan

PS1 - 19 - Aging-related changes in regulation of brain-heart coherence during dual tasking

Kübra Akbaş¹, Kelsi Petrillo¹, Hossein Ehsani¹, Nima Toosizadeh¹

¹ Rutgers University

PS1 - 20 - When gait matters: step length variability may be a stronger predictor of cognitive status than step width or walking speed reserve

Bre Morales¹, Jenna Yentes¹

¹ Texas A&M University

PS1 - 21 - Assessing age-related alterations in brain connectivity using dual tasking

Kelsi Petrillo¹, Hossein Ehsani¹, Kubra Akbas¹, Nima Toosizadeh¹

¹ Rutgers University

PS1 - 22 - Intradiscal pressure distributions in degenerated intervertebral discs

Asghar Rezaei¹, Chih-Hsiu Cheng², Areonna Schreiber¹, Babak Dashtdar¹, Maria Astudillo Potes¹, Xifeng Liu¹, Kai-Nan An¹, Kenton Kaufman¹, Lichun Lu¹

¹ Mayo Clinic, ² Graduate Institute of Rehabilitation Science

PS1 - 23 - The relationship between tibial bone density and peak knee adduction moment during level walking in older adults

Shelley Oliveira Barbosa¹, Tom Gale², Emelia Krakora², Raghav Ramraj², Kenneth Urish², William Anderst²

¹ University of Rhode Island, ² University of Pittsburgh

PS1 - 24 - Assessing knee joint mechanics in knee osteoarthritis phenotypes in aging adults

Mariana Jacobs¹, Sarah Malek², Stephen Duncan¹, Jeffrey Selby¹, Christopher Fry¹, Michael Samaan¹

¹ University of Kentucky, ² Purdue University

PS1 - 25 - An exploratory comparison of recovery kinematics between lab-induced trips and naturally-occurring real-world trips

Youngjae Lee¹, Neil Alexander², Christopher Franck³, Michael Madigan³

¹ Carilion Clinic, ² University of Michigan, ³ Virginia Polytechnic Institute and State University

PS1 - 26 - Eye drop bottle stability is related to sensorimotor performance in older adults

Daniel Duque Urrego¹, Stephen Cain¹, Cameron Haire², Alanson Sample², David Burke², Paula Newman-Casey², Susan Brown²

¹ West Virginia University, ² University of Michigan

PS1 - 27 - Evaluating sternum drop as a new trip recovery performance measure

Youngjae Lee¹, Michael Madigan²

¹ Carilion Clinic, ² Virginia Polytechnic Institute and State University

PS1 - 28 - Toward biomechanically valid synthetic human motion: an initial assessment

Adrian Krieger¹, Changseob Song¹, Inseung Kang¹

¹ Carnegie Mellon University

PS1 - 29 - Personalization of IMU-based joint kinematics estimation using computer vision

Changseob Song¹

¹ Carnegie Mellon University

PS1 - 30 - Unsupervised discovery of human motion primitives from biomechanical data

Carlos Carrasquillo¹, Aakash Bajpai², Lena Ting³, Anirban Mazumdar¹, Aaron Young¹

¹ Georgia Institute of Technology, ² Johns Hopkins University Applied Physics Laboratory, ³ Emory University and Georgia Tech

PS1 - 31 - Personalizing gait entrainment: a reinforcement learning approach to optimizing perturbation magnitude

Omik Save¹, Hyunglae Lee¹, Jennie Si¹, Junmin Zhong¹, Suhrud Joglekar¹

¹ Arizona State University

PS1 - 32 - Random forest classifier of stair ascent and descent embedded in a robotic ankle foot orthosis

Samuel Hopkins¹, Zachary Lerner¹

¹ Northern Arizona University

PS1 - 33 - AI-based reference model for personalized robot-assisted gait training for dependent ambulatory chronic stroke survivors

Derong Yang¹, Wen Liu¹

¹ University of Kansas Medical Center

PS1 - 34 - Automated machine learning to simplify the application of wearable sensors

Syedmojtaba Mohasel¹, Corey Pew¹

¹ Montana State University

PS1 - 35 - Integrating multiple biosensors to model postural agility

Charlize Lowrie¹, Rebecca Zifchock¹, Josiah Steckenrider¹, Gregory Freisinger¹, Christopher Aliperti¹, Mitchell Wollen¹, William Saunders¹, Nathan Adams¹, Caspian Bell¹

¹ United States Military Academy

PS1 - 36 - Determining optimal IMU sensor placement to predict center of pressure velocity during perturbed standing in the chronic stroke population

Isabelle Museck¹, Jesse Dean¹

¹ Medical University of South Carolina

PS1 - 37 - Towards general motion tracking in physics-based simulation

Hyoungseo Son¹, Seungmoon Song¹

¹ Northeastern University

PS1 - 38 - AI-based wearable gait analysis for proactive fall risk prediction

Patrick Kim¹

¹ Governor's Academy

PS1 - 40 - AI-assisted grading: Effects on student grades, faculty workload, and feedback quality

Nikita Kuznetsov¹

¹ University of Cincinnati

PS1 - 41 - Automated analysis of the worn condition for shoes: using smartphone pictures, convolutional neural networks, and thin-film modeling to predict loss in traction

Gerard Aristizábal Pla¹, Kurt Beschoner¹, Matthew Kaboly¹, Sydney Clements¹

¹ University of Pittsburgh

PS1 - 42 - Evaluation of auto-segmentation's ability to accurately define ankle bone edges

Abdulganeey Olawin¹, Emily Gray¹, Tom Gale¹, Macalus Hogan¹, William Anderst¹

¹ University of Pittsburgh

PS1 - 43 - Assessing two computed tomography image segmentation methods using morphology for application in abdominal aortic aneurysm

Emily Stephan¹

¹ University of Pittsburgh

PS1 - 44 - The concurrent equivalence and reliability of in-lab markerless motion capture in estimating kinematic waveforms during load carriage

Carlie Daquino¹, Brent Alvar¹, Arnel Aguinaldo¹

¹ Point Loma Nazarene University

PS1 - 45 - Towards a foundational model of pathological gait kinematics

R Daniel Magruder¹, Selim Gilon¹, Emily Miller¹, Scott Uhlich¹

¹ University of Utah

PS1 - 46 - Detecting emotions from gait biomechanics: a machine learning approach

Angeloh Stout¹, Gu Eon Kang¹

¹ University of Texas at Dallas

PS1 - 47 - Deep learning-based foot placement prediction models reveal multi-timescale control

Wei-Chen Wang¹, Antoine De Comite¹, Alexandra Voloshina², Monica Daley², Nidhi Seethapathi¹

¹ Massachusetts Institute of Technology, ² University of California, Irvine

PS1 - 48 - Validity of markerless motion analysis using a dynamic time warping approach

Eleonora Cabai¹, Jorge Chahla², Leonardo Metsavaht³, Gustavo Leporace⁴, Jonathan Gustafson¹

¹ Rush University Medical Center, ² Rush University, ³ Instituto Brasil de Tecnologia da Saude (IBTS), ⁴ Instituto Brasil de Tecnologias da Saúde

PS1 - 49 - Beyond 3D kinematics: A machine learning approach to identifying movement phenotypes across multiple tasks in orthopaedic patients

Eleonora Cabai¹, Jorge Chahla², Leonardo Metsavaht³, Gustavo Leporace³, Jonathan Gustafson¹

¹ Rush University Medical Center, ² Rush University, ³ Instituto Brasil de Tecnologias da Saúde

PS1 - 50 - Validation of using smartphone camera and human pose estimation algorithm for dynamic movement analysis

Huaqing Liang¹, Steven Leigh¹

¹ Marshall University

PS1 - 51 - Human activity recognition using large language models' few-shot learning of wearable data

Mohammed Alnemer¹, Zedong Hao¹, Jay Sunil Goenka¹, Rachneet Kaur², Manuel Hernandez¹

¹ University of Illinois at Urbana-Champaign, ² JP Morgan AI Research

PS1 - 52 - Transfer learning for biological joint moment estimation in stroke populations

Vaidehi Wagh¹, Dongho Park², Aaron Young², Inseung Kang¹

¹ Carnegie Mellon University, ² Georgia Institute of Technology

PS1 - 53 - Artificial intelligence for streamlined CAI diagnosis: Single-marker gait analysis using machine learning

Jaeyoung Cho¹, Victor Bonilla¹, Erik Wikstrom², Jaeho Jang¹

¹ University of Texas at El Paso, ² University of North Carolina at Chapel Hill

PS1 - 54 - The effect of growth period treadmill training on voluntary physical activity in adulthood

Jessica Murawski¹, Derek Jurestovsky¹, Jonas Rubenson¹, Stephen Piazza¹

¹ Pennsylvania State University

PS1 - 55 - Needle axial force and insertion speed during cadaveric canine epidural

Claudia Smith¹, Scott Brandon¹, Carolyn Kerr¹

¹ University of Guelph

PS1 - 56 - Evaluation of hemiarthroplasty bearing materials in animal models: A scoping review

Landon Begin¹, Victoria Marino², Francesca De Vecchi³, Douglas Moore¹, Markus Wimmer³, Joseph Crisco¹

¹ Brown University, ² University of Illinois at Chicago, ³ Rush University Medical Center

PS1 - 57 - Development of small bone implants in a porcine model for carpal bone replacement

Quianna Vaughan¹, Amy Morton¹, Douglas Moore¹, Joseph Crisco¹

¹ Brown University

PS1 - 59 - Multiarticular mechanical connections of the plantaris tendon in kangaroo rats

David Lin¹, Destinee Ditton², Nathan Schiele², Craig McGowan³

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PS1 - 60 - How do mechanical stimuli at the muscle tissue scale vary during resistance exercise?

Katherine Knaus¹, Mark Viggars², Casey Sexton³, Andrew McCulloch⁴, Karyn Esser²

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PS1 - 62 - The effect of chronic limb loading on the tibialis cranialis moment arm in guinea fowl

Roberto Castro Jr¹

¹ The Pennsylvania State University

PS1 - 63 - Markerless motion capture for full-body analysis of horses

Sarah Shaffer¹, Omar Medjaouri¹, Brian Swenson¹, Travis Eliason¹, Daniel Nicoletta¹

¹ Southwest Research Institute

PS1 - 64 - Built for balance: Unique knee joint morphology of birds enables passive unipedal stance

Skylar Taylor¹, Karen Graham², Asia Humphrey¹, Young-Hui Chang³

¹ Undergraduate Student, ² Undergraduate, ³ Georgia Institute of Technology

PS1 - 65 - Knee joint forces during unassisted and exoskeletal-assisted sit-to-stand and stand-to-sit maneuvers

Salma Mohammed¹, Gabriela De Carvalho¹, Harish Sekar¹, Vishnu D. Chandran², Ann M. Spungen³, Saikat Pal¹

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PS1 - 66 - Knee joint forces during exoskeletal-assisted walking in an FDA-approved exoskeleton: comparison between spinal cord injured and able-bodied participants

Gabriela De Carvalho¹, Ann M. Spungen², William A. Bauman³, Saikat Pal¹

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PS1 - 67 - Effect of parallel elastic element stiffness on UCL strain during a baseball pitch: a biomechanical model

Ben Baker¹, Kalin Blinstrub¹, Dustin Crouch²

¹ University of Tennessee-Knoxville, ² University of Tennessee

PS1 - 68 - Human joint level force responsiveness and control with exoskeleton assistance

Amro Alshareef¹, Gregory Sawicki¹

¹ Georgia Institute of Technology

PS1 - 69 - Kicking it off: Does toddler leg muscle activation while driving change with posture?

Madeleine McCreary¹, Kim Ingraham¹, Heather Feldner¹, Kat Steele¹

¹ University of Washington

PS1 - 70 - Design and evaluation of two 3D-printed pneumatic soft robot prototypes for finger extension rehabilitation

Maggie Deal¹, Brittany Heintz Walters¹, Max Anderson¹, Eric Olson¹, Jhet Cooperrider Young¹, Yen-Lin Han¹

¹ Seattle University

PS1 - 71 - Changes of knee laxity and stiffness in tibial rotation in knee osteoarthritis

Zongpan Li¹, Raziye Baghi¹, Giovanni Oppizzi², Peter Bowman¹, Li-Qun Zhang³

¹ University of Maryland, Baltimore, ² University of Maryland, College Park, ³ University of Maryland

PS1 - 72 - Muscle activity during walker-based exoskeleton use in children with cerebral palsy

Katie Landwehr-Prakel¹, Anna Fragomeni¹, Kristie Bjornson², Chet Moritz¹, Heather Feldner¹, Katherine Steele¹

¹ University of Washington, ² Seattle Children's Hospital

PS1 - 73 - Modular insole technology: A novel approach for pressure redistribution in diabetic foot

Gurpreet Singh¹, Arnab Chanda¹

¹ Indian Institute of Technology Delhi

PS1 - 74 - The effect of passive-mechanical prosthetic knee and ankle-foot components on gait safety during ramp ambulation

Miguel Vaca¹, Steve Gard¹, Kiley Armstrong¹, Matthew Major¹

¹ Northwestern University

PS1 - 75 - The effect of axis of rotation location on ankle-foot orthosis stiffness

Katherine Vaiciulis¹, Rachel Vitali¹, Deema Totah¹

¹ University of Iowa

PS1 - 76 - Active prosthetic wrist control reduces compensatory movements and improves functional outcomes

Grace Li¹, Mira Mutnick¹, Dylan Wallace¹, Cynthia Chestek¹, Deanna Gates¹

¹ University of Michigan

PS1 - 77 - Effects of a wearable hamstrings assistive device on leg motion in overground sprinting

Quinn Castner¹, Reed Gurchiek¹, Divya Srinivasan¹

¹ Clemson University

PS1 - 78 - ExerExo: Exploring the effects of assistive and resistive ankle exoskeleton torque on walking mechanics and energetics

Arshad Mandani¹, Gregory Sawicki¹, Zachary Lerner², Zachary Graham³

¹ Georgia Institute of Technology, ² Northern Arizona University, ³ Florida Institute for Human and Machine Cognition

PS1 - 79 - Self-adaptive passive elbow movement assistance (PEMA-S): a portable exoskeleton for enhancing elbow mobility in flexor hypertonia through angle-specific assistance

Sang Wook Lee¹, Ha Jessica Ngo¹

¹ Catholic University of America

PS1 - 80 - The effects of different terrains and inclined surfaces on force generation in association with a wheelchair

Somlata Dev Sharma¹, Tamara Bush¹

¹ Michigan State University

PS1 - 81 - Comparative study of shoulder joint stiffness in dynamic movement and static posture tasks

Seunghoon Hwang¹, Katia Ponce², Suhud Joglekar², Hyunglae Lee²

¹ California State University, Northridge, ² Arizona State University

PS1 - 82 - *OpenExo: experimental validation of an open-source modular exoskeleton*

Jack Williams¹, Shanpu Fang¹, Daniel Colley¹, Noah Enlow¹, Zachary Lerner¹

¹ Northern Arizona University

PS1 - 83 - *Effects of music on postural control among breast cancer survivors with chemotherapy-induced neuropathy (CIN)*

Lise Worthen-Chaudhari¹, Bhillie Luciani¹, Maryam Lustberg²

¹ Ohio State University, ² Yale University

PS1 - 84 - *Effects of pickleball on unilateral static balance and dynamic balance for young adults with intellectual disabilities*

Alana Turner¹, Emma Wilkinson², Mckenzie Hardee², Riley Hieb², Taylor Redensky², Kiana Brown², Harish Chander³, Adam Knight³

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PS1 - 85 - *Levodopa-induced dyskinesia in Parkinson's disease causes inflexible multisegmental coordination during standing*

Joseph Aderonmu¹, Carolin Curtze², Dobromir Dotov³

¹ University of Nebraska at Omaha, ² University of Nebraska, ³ University of Nebraska Omaha

PS1 - 86 - *Influence of bra type, body composition, and sex hormone levels on center of pressure measures during gait in full-busted women*

Stacey Gorniak¹, Abigail Clement², Saba Yazdekhashti¹, Emily Lavoy¹

¹ University of Houston, ² University of Kansas

PS1 - 88 - *Reactive adaptation to repeated standing trips in young adults*

Sara Mahmoudzadeh Khalili¹, Diane' Brown¹, Caroline Simpkins¹, Feng Yang¹

¹ Georgia State University

PS1 - 89 - *Acute and chronic effects of mild traumatic brain injury on reactive balance*

Cecilia Monoli¹, Paula Johnson², Amanda Morris³, Ryan Pelo¹, Leland E. Dibble¹, Peter Fino¹

¹ University of Utah, ² Robert Morris University, ³ California State University

PS1 - 90 - *Restricted antiphase trunk motion increases sway velocity and ankle torque during quiet stance*

Robert Creath¹, Veronica Venezia¹, Benjamin Hinkley¹, Niclas Sharp¹, Christopher Sciamanna²

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PS1 - 91 - *Effects of somatosensory augmentation on mediolateral standing balance*

Jesse Dean¹, Olivia Laird¹, Amber White¹

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PS1 - 92 - *Clinical balance and mobility outcomes following total hip arthroplasty*

Katarzyna Puzio¹, Sheryl Bourgaize², Emiko Arshad¹, Alyssa Tondat¹, Andrew Laing¹, Marina Mourtzakakis¹, Tina Mah³, Matthew Snider⁴, Paul Grosso⁴, Brandon Girardi⁴, Oliver Gauthier-Kwan⁴, Stephanie Nemirov⁴, Carla Girolametto⁴, Kailyn Clarke⁴

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PS1 - 94 - *Effect of bone-anchored limbs on dynamic balance in multiple activities of daily living*

Grace Georgiou¹, Nicholas Vandenberg¹, James Tracy², Cory Christiansen², Jason Stoneback¹, Brecca Gaffney¹

¹ University of Colorado Denver, ² University of Colorado

PS1 - 95 - *Neuromechanical characterization of human trunk function during real-world upper limb tasks*

Lily Liu¹, Quinn Boser¹, Albert Vette¹

¹ University of Alberta

PS1 - 96 - *Exploration of a clinical application of low-cost inertial measurement units and a custom-build Android application*

Joseph Wagner¹, Alex Roop¹, Kylie Evoy¹, Morgan Bleicher¹, Megan Gangl¹, Grant Kuhn¹, Daniel Panchik¹, Meghan Chemidlin², Alicia Reiser², Kurt Degode¹

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PS1 - 97 - *Examining the relationship between balance, fear of falling, and falls in older adults*

Amanda Holtzman¹, Kim Bigelow¹, Jordan Wilson¹

¹ University of Dayton

PS1 - 98 - *Factors associated with falls after a standing-slip in people with multiple sclerosis*

Diane' Brown¹

¹ Georgia State University

PS1 - 99 - Quantifying the connection between ankle proprioception and postural response to multi-dimensional pseudorandom perturbations

Sophia Chirumbole¹, Manami Fujii², Daniel Merfeld¹, Ajit Chaudhari¹

¹ Ohio State University, ² The Ohio State University

PS1 - 100 - Testing the feasibility of deploying standing and walking balance perturbations in patients with dementia with Lewy bodies

Emily Eichenlaub¹, Andrea Bozoki², Jason Franz³

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PS1 - 101 - Gait performance at the conclusion of a collegiate athletic career: role of repetitive head impacts

Thomas Buckley¹, Caitlin Gallo¹, Scott Passalugo¹, Barry Munkasy²

¹ University of Delaware, ² Georgia Southern University

PS1 - 102 - Collegiate female lacrosse players demonstrate asymmetry in time to stabilization following lateral hops

Kevin Dames¹, Gwyneth Laukaitis²

¹ SUNY Cortland, ² New York University

PS1 - 103 - Does limb specialization in track and field introduce asymmetry in dynamic stability?

Kevin Dames¹, Bryanne Bellovary¹, Jason Parks¹, Aaron Jones¹

¹ SUNY Cortland

PS1 - 104 - The relationship between knee isokinetic strength measures and bilateral balance performance in university students

Ben Meyer¹

¹ Shippensburg University

PS1 - 105 - Investigating the dual-task effect of sensory integration for navigation and dynamic balance control following mild traumatic brain injury

Sam Beech¹, Maggie K. Mccracken¹, Christina Geisler¹, Leland Dibble¹, Colby R. Hansen¹, Sarah Creem-Regehr¹, Peter Fino¹

¹ University of Utah

PS1 - 106 - Walk this way: Crocs® and the impact of heel-strap utilization on overground gait performance and lower-limb kinematics

Fabricio Saucedo¹, Pradeep Ambati², Thiago Teles Santos³

¹ Pennsylvania State University Altoona, ² California State University, San Bernardino, ³ Universidade Federal de Uberlândia

PS1 - 107 - Evaluation of pedestrian overturn risk associated with railing interaction

Robert Bove¹, Shady Elmasry¹, Bruce Miller¹, Elizabeth Rapp Van Roden¹, Dhara Amin¹, Rachael Aber¹

¹ Exponent, Inc

PS1 - 108 - Impact direction and brain injury mechanisms in sports: a finite element analysis of golf ball head impacts

Hossein Bahreinizad¹, Suman Chowdhury¹

¹ University of Florida

PS1 - 109 - Ground reaction force discrepancies between force plates and foot insoles: Implications for in field monitoring

Leutrim Mehmeti¹, Kaitlyn Buell², Felicia Davenport³, Therese Parr⁴, Charles Weisenbach², Jazmin Cruz⁴, Peter Le⁴

¹ Reef Systems Corp - Air Force Research Laboratory, ² Naval Medical Research Unit-Dayton, ³ Georgia Institute of Technology, ⁴ Air Force Research Laboratories (ORISE)

PS1 - 110 - Assessing the upper limb kinematics of a novel wheelchair design for participants with spinal cord injury: A pilot study

John Looft¹

¹ Minneapolis VA Health Care System

PS1 - 111 - Automated recognition of user intent for dishwasher use via motion capture analysis

Kanghyeon Lee¹, Taehyung Kim¹, Gwanseob Shin¹, Yoonhee Jeong²

¹ Ulsan National Institute of Science and Technology (UNIST), ² HS R&D Center, LG Electronics

PS1 - 113 - Comparison of lumbar loads during initial ground impact of military parachute jumping tasks

Jazmin Cruz¹, Felicia Davenport², Peter Le¹

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PS1 - 114 - Impact of back-support exoskeletons on trunk muscle coactivation during lifting

Rahul Narasimhan Raghuraman¹, Divya Srinivasan¹

¹ Clemson University

PS1 - 115 - The relationship between an individual's height and the movement strategies implemented to perform manual patient-handling tasks

Regina Vicente¹

¹ Hope College

PS1 - 116 - Evaluating optimization criteria in the AnyBody Modeling System for estimating muscle activity during lifting with and without a back-support exoskeleton

Mohamad Behjati Ashtiani¹, Lingyu Li², Sunwook Kim², Maury Nussbaum²

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PS1 - 117 - Analysis of the effects of helmet inertial properties on cervical spine loading

Gustavo Paulon¹, Suman Chowdhury¹

¹ University of Florida

PS1 - 118 - Biomechanical analysis of the shoulder undergoing industry relevant tasks

Carlo Canezo¹, Gregory Sawicki¹, Dustin Crouch²

¹ Georgia Institute of Technology, ² University of Tennessee

PS1 - 119 - The influence of sex and individual variation on contributions to torso lateral bending

Jordan Sturdy¹, Anne Silverman¹

¹ Colorado School of Mines

PS1 - 120 - The mechanical loading of the spine during patient transfer from bed to wheelchair in physical therapists

Seyoung Lee¹, Kitaek Lim¹, Junwoo Park¹, Wocho Choi¹

¹ Yonsei University

PS1 - 121 - A case study analysis of ground condition on ladder setup angle and climbing friction

Erika Pliner¹, Carson Davis¹, Cole Ward¹

¹ University of Utah

PS1 - 122 - Ladder foot friction across ground conditions

Erika Pliner¹, Cole Ward¹, Carson Davis¹, Kurt Beschorner²

¹ University of Utah, ² University of Pittsburgh

PS1 - 123 - Arm swing, trunk rotation, and free moment during running

Joseph Mahoney¹, Allison Altman-Singles², Naomi Fay², Amanda Mueller², Abby Miller², Teresa Reed²

¹ Alvernia University, ² Penn State Berks

PS1 - 124 - Variation of lumbar rotation during asymmetric patient handling tasks

Elsa Brillinger¹, Regina Vicente¹, Brooke Odle¹

¹ Hope College

PS1 - 125 - Evaluating contamination risk during medical gown doffing using movement analysis: A preliminary study

Jinfeng Li¹, Li-Shan Chou²

¹ Iowa State University, ² Purdue University

PS1 - 126 - Shoulder exoskeleton EMG and usability assessment at a construction worksite

Jason Gillette¹, Madeline Jenkins¹, Josh Riesenbergs¹

¹ Iowa State University

PS1 - 127 - Lumbar shear loads of ADLs/lifting tasks and rear-end collisions

Kevin Adanty¹, Jordan Ogbu Felix², Clyde Westrom², Keya Zambare², John Adam Caraan², Sean Shimada¹

¹ Aperture LLC, ² Biomechanical Consultants Inc.

PS1 - 128 - Firefighter's turnout gear limitations on mobility: A scoping review

Kuan-Ting Chen¹, Jenna Yentes¹

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PS1 - 129 - Validation of an ultrasound-embedded shoe for measuring plantar tissue properties

Nicholas Ozanich¹, Scott Telfer¹, Ellen Li², William Ledoux²

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PS1 - 130 - Potential mechanical biomarker for chronic lower back pain using 3D-ultrasound strain tensor imaging

Zhiyu Sheng¹, Maryam Satarpour¹, John Cormack¹, Yu-Hsuan Chao¹, Emily Landis-Walkenhorst¹, Allison Bean¹, Ryan Nussbaum¹, Jiantao Pu¹, Ajay Wasan¹, Kang Kim¹

¹ University of Pittsburgh

PS1 - 131 - A reliable tool to characterize Achilles subtendon behavior within the tendon cross section

Kathryn Strand¹, Todd Hullfish¹, Maggie Wagner¹, Josh Baxter¹

¹ University of Pennsylvania

PS1 - 132 - Handheld ultrasound measurement of Achilles tendon thickness: intra- and inter-rater reliability at single location and orientation

Kendall Mulvaney¹, Julia Dunn¹, Michelle Sabick¹, Julio Serrano Samayoa¹

¹ University of Denver

PS1 - 133 - Carpal tunnel area measurement using ultrasound imaging

Mary Henderson¹, David Jordan¹, Zong-Ming Li¹

¹ University of Arizona

PS1 - 134 - Measurements of post-operative subsidence after trapeziectomy may be inaccurate when using standard posteroanterior and lateral radiographs

Sanah Handu¹, Cortez Brown¹, Edward Godbold¹, Tom Gale¹, M. Zino Kuhn¹, Maria Munsch², John Fowler², William Anderst¹

¹ University of Pittsburgh, ² University of Pittsburgh Medical Center

PS1 - 135 - A preliminary study on the validity and reliability of freehand 3D ultrasound for gluteus medius muscle volume quantification in healthy young adults

Ali Karimi Azandariani¹, Hyun Kyung Kim¹, Megan Gordon¹, Irene Kaiser¹, Oluwagbemiga Dademathews¹, Ali Mirjalili²

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PS1 - 136 - Muscle architecture analysis of agonist/antagonist pairs show differences in cerebral palsy compared to typically developing adolescents

Zhenhao Liu¹, Geoffrey Handsfield²

¹ University of North Carolina at Chapel Hill, ² University of North Carolina

PS1 - 137 - Assessment of calcaneal morphological differences of pediatric flatfoot via statistical shape modeling

Nick Slavik¹, Renae Lapins², Amanda Whitaker³, Amy Lenz², Karen Kruger⁴

¹ Medical College of Wisconsin, ² University of Utah, ³ University of California, Davis, ⁴ Marquette University

PS1 - 138 - Repeatability of Hounsfield unit measurements in bone from weight bearing CT

Tyce Marquez¹, Anup Pant¹, Tadiwa Waungana², Sarah Manske², Joshua Johnson¹, Don Anderson¹

¹ University of Iowa, ² University of Calgary

PS1 - 139 - Kinematics of the pre-operative dysplastic hip

Connor Luck¹, Edward Godbold¹, Camille Johnson¹, Ashley Disantis¹, Craig Mauro¹, Michael McClincy¹, William Anderst¹

¹ University of Pittsburgh

PS1 - 140 - Knee bone alignment is predictive of non-operative outcomes in patellar instability

Marissa Sinopoli¹, Anthony Gatti², Christian Wright², Anna Bartsch³, Matthew Veerkamp⁴, Robert Boutin⁵, Douglas Mintz⁶, Kathleen Emery⁴, Beth Shubin Stein⁶, Shital Parikh⁴, Kevin Shea⁵, Akshay Chaudhari², The Jupiter Study Group⁷, Seth Sherman⁵, Scott Delp²

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PS1 - 141 - Using virtual mechanical testing to probe mechanical strain in bone fracture healing

Maham Tanveer¹, Alireza Ariyanfar¹, Peter Schwarzenberg², Peter Varga², Hannah Dailey¹

¹ Lehigh University, ² AO Foundation

PS1 - 142 - Quantitative MRI evaluation of the meniscus with and without applied load in patients 1–2 years following ACL reconstruction with meniscal surgery

Divya Pradip Roy¹

¹ University of Vermont

PS1 - 143 - In vivo cervical spine kinematics in neck pain and generalized joint hypermobility

Rebecca Abbott¹, Maxwell Carlson², William Couture², Bryan Peralta Garces², May-Ling Li², Lacy Richter², Yaqoub Yusuf², Alan Mangan², Arin Ellingson³

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PS1 - 144 - 3D muscle-tendon anatomy in healthy and surgically repaired biceps brachii

Jorie Budzikowski¹, Sam Gillespie¹, Ilana Deutsch¹, Stephen Gryzlo¹, Wendy Murray¹

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PS1 - 145 - Quantitative measures of bone marrow edema to assess bone stress injury

Rachel Shalit¹, Olivia L. Bruce¹, Kathryn J. Stevens¹, Yael Vainberg¹, Abigail McIntyre², Emily Kraus², Feliks Kogan¹

¹ Stanford University School of Medicine, ² Department of Orthopaedic Surgery

PS1 - 147 - Knee joint adaptations associated with patella femoral pain syndrome in collegiate women volleyball athletes across a competitive season

Erica King¹, Charlotte M. Lim¹, Morgan Lamarre¹, Lauren Distad¹, Abhishek Aher¹, Angela Miller¹, Margaret Jones¹, Parag Chitnis¹

¹ George Mason University

PS1 - 148 - Stepping into motherhood: plantar fascia stiffness and arch height during pregnancy

Lauren Williams¹, Dustin Bruening¹

¹ Brigham Young University

PS1 - 149 - Using Digital Image Correlation with a tensile test to measure strain properties of the interspinous ligament

Isaac Kumi¹, Abed Khosrojerdi¹, Ahmadreza Ravangard¹, Oleksandr Kravchenko¹, Sebastian Bawab¹, Stacie Ringleb¹

¹ Old Dominion University

PS1 - 150 - Annulus piston excitation minimizes tissue compression artifact in focused shear wave transient elastography

Yu-Hsuan Chao¹, Kang Kim¹, John Cormack¹

¹ University of Pittsburgh

PS1 - 151 - Investigating upper trapezius muscle quality in people with or without chronic shoulder pain

Chun-Kai Tang¹, Yi Fen Shih¹

¹ National Yang Ming Chiao Tung University

PS1 - 152 - Supraspinatus muscle morphology and architecture assessment after rotator cuff tear and surgical repair using Dixon and diffusion tensor imaging methods

Raquel Miera¹, Kathryn Rex¹, Lilla Caton¹, April Armstrong¹, Thomas Neuberger¹, Meghan Vidt¹

¹ Pennsylvania State University

PS1 - 153 - Comparing observed Achilles tendon characteristics across sports

Camille Nguyen¹, Joshua K. Sponbeck², Martina Uvacsek³, Dora Molnar³, Wayne Johnson¹

¹ Brigham Young University, ² Weber State University, ³ Magyar Testnevelési és Sporttudományi Egyetem

PS1 - 154 - Predicting head injury criterion in real-world rear-end vehicle collisions

Clyde Westrom¹, Kevin Adanty², Sean Shimada²

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PS1 - 155 - Preliminary impact testing of an ovine model to validate a biomechanical test method for cadaveric studies

Madysn Cardinal¹, Abbie Underwood¹, John Desjardins¹, Gregory Batt¹

¹ Clemson University

PS1 - 156 - High g-forces in unintentional improper infant handling: Implications for shaken baby syndrome

Lila Wayman¹, Jonathan Lee-Confer¹, Kathryn Havens²

¹ University of Arizona, ² University of Southern California

PS1 - 157 - Kinematic response to warned and unwarned perturbations in running humans

Alicia Boynton¹

¹ Madonna University

PS1 - 158 - A multivariable model of peak lower spine acceleration during near-side lateral impacts

John Adam Caraan¹, Clyde Westrom¹, Kevin Adanty², Sean Shimada²

¹ Biomechanical Consultants Inc., ² Aperture LLC.

PS1 - 160 - A kinematic comparison of lumbar spine and pelvic acceleration in IIHS rear-end sled tests

Keya Zambare¹, John Adam Caraan², Clyde Westrom², Kevin Adanty³, Sean Shimada³

¹ Biomechanical Consultants, ² Biomechanical Consultants Inc., ³ Aperture LLC.

PS1 - 161 - Head contact points and acceleration during vehicle collisions by impact angle

Jordan Ogbu Felix¹, Kevin Adanty², Sean Shimada²

¹ Biomechanical Consultants Inc., ² Aperture LLC.

PS1 - 162 - Ankle and foot biomechanics during pregnancy using markerless motion capture

Michelle Meyers¹, Josh Baxter¹

¹ University of Pennsylvania

PS1 - 163 - Frontal plane jerk cost and fluctuation analysis for individuals with ACL reconstruction and osteoarthritis

Nicholas Hunt¹, Tyler Brown¹

¹ Boise State University

PS1 - 164 - Side-stepping does not increase intact knee moments in bone-anchored prostheses users compared to straight-line walking

Maliheh Fakhar¹, Jenna Burnett², John Pope¹, Gauri Desai³, Ross Miller¹, Jae Kun Shim⁴

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PS1 - 165 - Long-term strength deficits post-ACLR impact higher-demand task performance

Camille Johnson¹, Tereza Janatova¹, Meredith Owen¹, Brian Noehren¹

¹ University of Kentucky

PS1 - 166 - Gait differences between fallers and non-fallers in people with knee osteoarthritis

Joy Itodo¹, Steven Garcia², Oiza Peters², Paige Perry¹, Ogundoyin Ogundiran¹, Kharma Foucher¹

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PS1 - 167 - Comparison of ankle kinematics between inertial measurement units and 3D optical motion capture system in various walking conditions

Jongsu Kim¹, Sanghyun Cho¹, Lingchao Xie¹

¹ Yonsei University

PS1 - 168 - Effect of treadmill training on joint kinematics in infants with Down syndrome

Yeon Joo Kang¹

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PS1 - 169 - Prosthesis attachment type does not affect the ground reaction force and leg alignment nor the metabolic cost of walking in transfemoral amputees

Gauri Desai¹, Maliheh Fakhar², Chioma Ezeajughi³, John Pope³, Jae Kun Shim³, Ross Miller²

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PS1 - 170 - Bone-anchored limb use reduces hip power and work during swing limb advancement

James Tracy¹, Brecca Gaffney², Peter Thomsen-Freitas¹, Mohamed Awad¹, Danielle Melton¹, Cory Christiansen¹, Jason Stoneback¹

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PS1 - 171 - Towards a greater understanding of barriers to outdoor mobility to inform lower limb prosthetics research and design

Jenny Kent¹, Szu-Ping Lee²

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PS1 - 172 - Gait differences in children with Down syndrome with and without supramalleolar orthosis

Robert Zeid¹, Jianhua Wu¹, Alexandre Kotarski¹, Yeon Joo Kang¹

¹ Georgia State University

PS1 - 173 - Inertial measurement units to predict prosthetic propulsion and power

Thomas Madden¹, Corey Pew¹

¹ Montana State University

PS1 - 174 - Propulsion changes induced by dynamic treadmill walking post-stroke

Brooke Hall¹, Caitlin Banks¹, Ryan Roemmich¹

¹ Kennedy Krieger Institute

PS1 - 175 - Adaptive split-belt treadmill may improve propulsion symmetry in people with chronic stroke

Rucha Kulkarni¹, Jill Higginson¹

¹ University of Delaware

PS1 - 176 - Energetics of walking with within-stride changes in treadmill speed post-stroke

Caitlin Banks¹, Brooke Hall¹, Ryan Roemmich¹

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PS1 - 177 - Walk, stumble, recover faster, and prevent long-term effects with pink noise

Marilena Kalaitzi Manifrenti¹, Nick Stergiou¹, Aaron Likens¹

¹ University of Nebraska at Omaha

PS1 - 178 - Comparison of three-dimensional trunk and upper extremity joint kinematics during wheelchair propulsion using marker- and markerless-based motion analysis

Jungsun Moon¹, Matthew Hanks¹

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PS1 - 179 - Use of haptic feedback to increase plantarflexion and propulsion

Margo Donlin¹

¹ Bucknell University

PS1 - 180 - Knee-Joint Loading During Gait of TKA Patients 2 Months After Surgery: A Preliminary Study

Alejandro Ovispo-Martinez¹, Songning Zhang¹, Tsung-Lin Lu², Walter Menke¹, Katie Stevens³, Harold Cates³

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PS1 - 181 - Gait phase and slopes affect joints' contributions to stability, not orbital stability

Chae Lynne Kim¹, Jungho Lee¹, Joeeun Ahn¹

¹ Seoul National University

PS1 - 182 - The association between center of mass variability and dynamic knee joint stiffness in people with knee osteoarthritis

Ogundoyin Ogundiran¹, Steven Garcia¹, Joy Itodo¹, Oiza Peters¹, Paige Perry¹, Kharma Foucher¹

¹ University of Illinois at Chicago

PS1 - 183 - Running habits and injury patterns in parents using running strollers

Allison Altman-Singles¹, Grace Kim¹

¹ Penn State Berks

PS1 - 184 - Influence of Ballet Technique Jump Style on Lower Body Mechanics

Hailey Wrona¹, Glenna Clifton², Kathleen Bieryla², Shawn Russell¹

¹ University of Virginia, ² University of Portland

PS1 - 185 - Stress fractures of metatarsals in an adolescent cross-country runner – case study

Mika Ndikumana¹, Megan Gordon¹, Ali Karimi Azandariani¹, Julio Morales¹, Hyun Kyung Kim¹

¹ Louisiana State University

PS1 - 186 - Kinematic differences exist at the hip but not the knee between standardized and normalized running speeds in healthy female and male runners

Eric Foch¹, Richard Brindle², Kevin Ford³

¹ Central Washington University, ² Shaw Sports Turf, Shaw Industries Group, Inc., ³ High Point University

PS1 - 188 - Activity-induced changes in pain and gait in adults with and without knee OA

Julien Mihy¹, Mayumi Wagatsuma¹, Katie Butera¹, Elisa Arch¹, Stephen Cain², Jocelyn Hafer¹

¹ University of Delaware, ² West Virginia University

PS1 - 189 - Walking kinematics during treadmill, overground, and outdoor walking

Jingjing Sun¹, Diego Samson¹, Chang Liu¹

¹ University of Illinois at Chicago

PS1 - 190 - Leveraging inertial measurement units for quantifying variability in outdoor walking

Ruchika Iqbal¹, Jeffery Haddad¹, Satyajit Ambike¹

¹ Purdue University

PS1 - 191 - Validation of a single mask type IMU for running gait analysis

Yoojin Choi¹, Jaeyoun Choi², Hyunji Kim¹, Joeeun Ahn¹, Jinmo Kim³, Kibeom Lee³, Jaehoon Kim⁴

¹ Seoul National University, ² Massachusetts Institute of Technology, ³ Neumafit Inc., ⁴ ETH Zurich

PS1 - 192 - Unevenly added mass decreases peak hip flexion and increases hip extension in non-pregnant women during over ground walking

Mathew Sunil Varre¹, Grace Watson², Janet Zhang-Lea¹

¹ University of Oregon, ² Gonzaga University

PS1 - 193 - Body size, gait mechanics and maximal running speeds

Gouresh Powar¹, Peter Weyand¹

¹ Texas Christian University

PS1 - 194 - The influence of speed on stair ascent functional demand is joint dependent

Abigail Salvatore¹, Sarah Roelker¹

¹ University of Massachusetts Amherst

PS1 - 195 - Step length affects metatarsophalangeal joint moments during forefoot rocker phase of walking

Harsh Buddhadev¹, Emily Lovekin²

¹ Sam Houston State University, ² Seattle Children's Hospital, Seattle, WA

PS1 - 196 - Reviewing measures of metabolic rate across walking speeds and estimating the cost of pregnant walking across gestation

Elizabeth Bell¹, Jenna Burnett², Samantha Snyder³

¹ Towson University, ² University of Utah, ³ University of Maryland

PS1 - 198 - 3D kinematics of uneven-terrain gait using a multi-segment foot model

Taylor Hoekstra¹, Lisa Macfadden²

¹ Dordt University, ² University of South Dakota

PS1 - 199 - Effect of walking speed on joint angles during treadmill walking with rhythmic auditory stimulation at preferred cadence

Haneol Kim¹, Matthew Beerse², Jianhua Wu³

¹ University of Wisconsin – La Crosse, ² University of Dayton, ³ Georgia State University

PS1 - 200 - Long-term trend analysis of spatiotemporal measures in self-paced treadmill walking

Hong Min¹, Jangwhan Ahn¹, Jeongin Moon¹, Jungho Lee¹, Hyeonyong Lee¹, Joeeun Ahn¹

¹ Seoul National University

PS1 - 201 - Greater toe flexor strength associates with lesser soleus activation during walking

Ross Smith¹, Jason Franz², Kota Takahashi³, Howard Kashefsky⁴, Aubrey Gray⁵

¹ University of North Carolina, ² North Carolina State University, ³ University of Utah, ⁴ University of North Carolina at Chapel Hill, ⁵ University of North Carolina at Chapel Hill & North Carolina State University

PS1 - 202 - Altered kinematics and muscle synergies during gait in persons with Multiple Sclerosis

Qiang Guo¹, Haya Alharthi¹, Nessa Sontag¹, Fan Gao¹

¹ University of Kentucky

PS1 - 203 - Positive relationship between motor and perceptual adaptation during split-belt walking

Marcela Gonzalez-Rubio¹, Amber Costello¹, Pablo Iturralde², Gelsy Torres-Oviedo¹

¹ University of Pittsburgh, ² Universidad Católica del Uruguay

PS1 - 204 - Going dark: blindfolded hypogravity adaptation differentially affects motor and cognitive tasks

Chase Rock¹, Hyorim Kim¹, Young-Hui Chang¹

¹ Georgia Institute of Technology

PS1 - 205 - Similarity across walking contexts improve the generalization of motor adapted patterns

Adwoa Awuah¹, Dulce Mariscal Olivares¹, Krista Fjeld², Gelsy Torres-Oviedo¹

¹ University of Pittsburgh, ² MR3 MUSC

PS1 - 206 - In estimating paretic propulsion, trailing limb angle may be less than the sum of its parts

Austin Mituniewicz¹, Jonathan Stallrich², He Huang¹, Michael Lewek¹

¹ University of North Carolina at Chapel Hill, ² North Carolina State University

PS1 - 207 - A finite element-based mesh morphing technique for subject specific human head modeling

Anastasia Tzoumaka¹, Anu Tripathi¹, Rika Carlsen¹

¹ Robert Morris University

PS1 - 208 - Validity of markerless motion capture for assessing osteoarthritic knee biomechanics

Ke Song¹, Carla Scanzello¹, Joshua Baker¹, Josh Baxter¹

¹ University of Pennsylvania

PS1 - 209 - Prosthetic pylon emulator for controlling stiffnesses under gait loading

Chelsea Haddy¹, Emma Caringella¹, Carl Curran², Joshua Caputo², Trevor Kingsbury³, Matthew Major⁴, Kota Takahashi¹

¹ University of Utah, ² Humotech, ³ Naval Medical Center, San Diego, ⁴ Northwestern University

PS1 - 210 - Evaluating markerless motion capture in children with cerebral palsy wearing ground reaction ankle-foot orthoses

Riley Horn¹, John Collins¹, Heather Waters¹, Christine Amacker¹, Martins Amaechi¹, Rachel Thompson¹, Patrick Curran¹, Henry Chambers¹

¹ Rady Children's Hospital

PS1 - 211 - Biomechanical simulation of 55 yoga poses reveals that the yoga poses are more diverse kinematically than kinetically

Sriram Sekaripuram Muralidhar¹, Manoj Srinivasan²

¹ University of Southern California, ² Ohio State University

PS1 - 212 - Manual labeling vs auto labeling

Alex Phan¹, Tishya Wren¹, Shawn Roberts¹

¹ Children's Hospital of Los Angeles

PS1 - 213 - Validation of a multi-segment foot model using weight-bearing CT

Matheus Vilela¹, Pedro Benevides², Lucas Pallone¹, Felipe F. Gonzalez¹, Gustavo Leporace², Leonardo Metsavaht², Jonathan Gustafson¹

¹ Rush University Medical Center, ² Instituto Brasil de Tecnologias da Saúde

PS1 - 214 - Estimation of the Hip Joint Center in 3 Month Old Humans

Abby Brittain¹, John Collins², Michael Harris³, Christine Farnsworth², Vidayadhar Upasani², Erin Mannen¹

¹ Boise State University, ² Rady Children's Hospital, ³ Washington University in St. Louis

PS1 - 215 - A novel approach to uncovering governing equations of sports movement

Seung Kyeom Kim¹, Tyler Wiles¹, Aaron Likens¹

¹ University of Nebraska at Omaha

PS1 - 216 - Guidelines for parameter selection for cross recurrence quantification analysis

Seung Kyeom Kim¹, Tyler Wiles¹, Nick Stergiou¹, Aaron Likens¹

¹ University of Nebraska at Omaha

PS1 - 217 - Validation of OpenCap during the Triangle Completion Test

Ying Fang¹, Rachel Ludwig², Sabnam Hajari², Janet Helminski²

¹ Rosalind Franklin University, ² Rosalind Franklin University of Medicine

PS1 - 218 - Wearable delivery of mechanical stimulus to improve tendon healing

Andy Smith¹, Tomonobu Ishigaki², Karin Grävare Silbernagel¹, Stephanie Cone¹

¹ University of Delaware, ² Niigata University of Health and Welfare

PS1 - 219 - Influence of site on pre/post clinical performance and patient-reported outcome changes observed within intervention group in a multisite randomized clinical trial

Nathaniel Bates¹

¹ Ohio State University

PS1 - 220 - Influence of site on pre/post biomechanical changes observed within intervention group in a multisite randomized clinical trial

Nathaniel Bates¹

¹ Ohio State University

PS1 - 221 - Quantifying the relationship between infant body position and breathing: a pilot study

Holly Olvera¹, Autumn Ost¹, Ryan Tam¹, Abby Brittain¹, Chris Wilson¹, John Carroll², Brandi Whitaker³, Megan Koster¹, Camille Stover¹, Andrew Bossert¹, Clare Fitzpatrick¹, Erin Mannen¹

¹ Boise State University, ² Arkansas Children's Research Institute, ³ Arkansas Children's Research Institute

PS1 - 222 - Effects of slip velocity and duration on fall incidence: evidence from unexpected slip perturbations induced by a split-belt treadmill

Chihyeong Lee¹, Joeeun Ahn¹, Beom-Chan Lee²

¹ Seoul National University, ² University of Houston

PS1 - 223 - Implications of time normalization during bilateral landings in patients with ACLR compared to healthy controls

Samantha Weiss¹, Robin Queen¹, Kevin Ford², Sara Arena¹, Joseph Hart Iii³, Thomas Ollendick⁴

¹ Virginia Polytechnic Institute and State University, ² High Point University, ³ Professor of Orthopaedic Surgery, University of North Carolina Chapel Hill, ⁴ University Distinguished Professor Emeritus of Psychology

PS1 - 224 - Enhancing gait retraining with musical feedback: speed, cadence, and biomechanical changes

Luisa Cedin¹, Camilla Antognini¹, Christopher Ferrigno¹, Christopher Knowlton¹, Markus Wimmer¹

¹ Rush University Medical Center

PS1 - 225 - Validity of OpenCap to identify marker locations on the lower limb

Madison Arno¹, Louis Diberardino¹

¹ Ohio Northern University

PS1 - 227 - Offest feet induce greater plantarflexor muscle forces during rising in sit-to-walk

Michael Miller¹, Anne Silverman¹, Eline Van Der Kruk²

¹ Colorado School of Mines, ² Delft University of Technology

PS1 - 228 - On bracing the neck muscles for a head perturbation: experimental and analytical study

Hogene Kim¹, Yumeng Wang², Anita Vasavada³, James A Ashton-Miller¹, James T. Eckner⁴

¹ University of Michigan, ² University of Michigan - Ann Arbor, ³ Washington State University, ⁴ University of Michigan Hospital

PS1 - 229 - The effects of psychosocial stress on surface electromyography signals of the lower leg during isometric contractions

Sierra Eady¹, Michael Zabala¹, Ivan Nail-Ulloa¹

¹ Auburn University

PS1 - 230 - The effects of saddle height on the knee joint during cycling

Fangbo Bing¹, Tony Lin-Wei Chen¹, Yan Wang¹, Ming Zhang¹

¹ Hong Kong Polytechnic University

PS1 - 231 - Using Continuous Relative Phase to assess ground reaction force coordination in single leg countermovement jumps

Jeromy Miramontes¹

¹ Prisma Health

PS1 - 232 - Motor unit recruitment variability during stationary cycling

Robert Creath¹, Alex Wiggins¹

¹ Lebanon Valley College

PS1 - 233 - Maximum voluntary contraction muscle activity in individuals with acute transtibial amputation

Mai-Ly Thompson¹, Nicole Stafford¹, Daniel Ferris¹

¹ University of Florida

PS1 - 234 - Exploring nonlinear muscle networks during yoga postures and functional tasks

Gaurav Seth¹, Soniya Kadam¹, Rory O'keeffe¹, S. Farokh Atashzar¹, Smita Rao¹

¹ New York University

PS1 - 235 - Sex-based differences in glenohumeral joint function in individuals with a symptomatic isolated supraspinatus tear after a 12-week personalized exercise therapy to 5 years

Lidya Canturk¹, Luke Mattar¹, Richard Debski¹, William Anderst¹, Jumpei Inoue¹, Adam Popchak¹, James Irrgang¹, Volker Musahl¹

¹ University of Pittsburgh

PS1 - 236 - Knee muscle coactivation during yoga and activities of daily living

Soniya Kadam¹, Rory O'keeffe¹, Riva Karia¹, S. Farokh Atashzar¹, Smita Rao¹

¹ New York University

PS1 - 237 - Energy absorption analysis reveals persistent knee deficits underestimated by isokinetic testing during return-to-sport following ACL reconstruction

Lin Wei¹, Samuel Imbus², Andrew Parker²

¹ University of Pittsburgh, ² Texas Health Sports Medicine Allen

PS1 - 238 - The role of neuromuscular control and electromyographic properties in maximum voluntary contraction of the muscle after brachial plexus injury

Sandesh Bhat¹, Zheng Wang¹, Alexander Shin¹, Richard Lieber², Kenton Kaufman¹

¹ Mayo Clinic, ² Shirley Ryan AbilityLab

PS1 - 239 - Electromyographic analyses of shoulders post-Latarjet procedure

Renato Miyadahira¹, João Artur Bonadiman², Vitor La Banca², Talissa Generoso³, Felipe Gonzalez³, Matheus Vilela³, Grant E. Garrigues³, Gregory Nicholson⁴, Jonathan Gustafson³

¹ Research Fellow, ² Instituto Brasil de Tecnologias da Saúde, ³ Rush University Medical Center, ⁴ Rush University

PS1 - 240 - Failure properties of muscle-tendon units under passive tension at different strain rates

Adrina Iachini¹, Benjamin Wheatley¹

¹ Bucknell University

PS1 - 241 - Biomechanics of an optimized sprint start testing three distances from the start line

Melissa Patton¹

¹ Elizabethtown College

PS1 - 242 - Between-joint coordination strategy does not change after a total knee arthroplasty

Kathryn Blessinger¹, Jennifer Perry¹, Reese Lloyd¹, Laura Schmitt¹, Ajit Chaudhari¹, Robert Siston¹

¹ Ohio State University

PS1 - 243 - Feedback parameters for a closed-loop multiple-input multiple-output model of the upper limb

Ian Syndergaard¹, Dario Farina², Steven Charles¹

¹ Brigham Young University, ² Imperial College London

PS1 - 244 - Approach to rising from a chair does not change following total knee arthroplasty

Kathryn Blessinger¹, Reese Lloyd¹, Laura Schmitt¹, Ajit Chaudhari¹, Robert Siston¹

¹ Ohio State University

PS1 - 245 - Transtibial bone-anchored limbs affect sound limb knee cartilage contact pressure

Mitchell Ekdahl¹, Cory Christiansen², Jason Stoneback¹, Brecca Gaffney¹

¹ University of Colorado Denver, ² University of Colorado

PS1 - 246 - The influence of pain classification methods in understanding thumb joint loading in women with carpometacarpal osteoarthritis

Alexis Benoit¹, Tamara Ordonez Diaz¹, Yenisel Cruz-Almeida¹, Jennifer Nichols¹

¹ University of Florida

PS1 - 247 - Rigid body modeling outcomes using osteogenesis imperfecta specific geometry

Maeve McDonald¹, Christina Garman², Rachel Lenhart¹, Jessica Fritz¹

¹ Medical College of Wisconsin, ² Marquette University

PS1 - 248 - Sagittal plane stiffness evaluation of a surrogate neck device and a computational model

Anthony Marino¹, Reed Gurchiek¹, Greg Batt¹, John Desjardins¹

¹ Clemson University

PS1 - 249 - What determines whether an ankle sprain occurs when the rear foot lands on an irregular surface? Insights from a frontal plane dynamic model

Andrea Kowalski¹, Hogene Kim¹, James A Ashton-Miller¹

¹ University of Michigan

PS1 - 250 - Effect of kinematic constraints and bushing loads on model-predicted cervical spine joint loads

Anita Vasavada¹, Jeffrey Reinbolt²

¹ Washington State University, ² University of Tennessee

PS1 - 251 - Sequential Vs. Simultaneous Personalization of Lower Extremity Functional Axes

Robert Salati¹, Benjamin Fregly¹

¹ Rice University

PS1 - 252 - Automatic foot-ground contact model personalization robustly reduces force plate position errors for multiple subjects

Spencer Williams¹, Geng Li¹, Claire Hammond¹, Benjamin Fregly¹

¹ Rice University

PS1 - 253 - Development of upper-limb muscle architecture following brachial plexus birth injury

Vivian Mota¹, Katherine Saul¹, Kyla Bosh², Jacqueline Cole³, Christina Lasdin¹, Isabel Baillie¹, Marisa Boretti²

¹ North Carolina State University, ² University of North Carolina at Chapel Hill, ³ UNC Chapel Hill and NCSU

PS1 - 254 - Investigating the influence of the extrinsic toe flexors in jumping

Ben Perrin¹, John Challis¹

¹ Pennsylvania State University

PS1 - 255 - Prediction of bone ingrowth into porous swelling bone anchors using an osteoconnectivity-based adaptive framework

Amirreza Sadighi¹, Nolan Black¹, Mehrangiz Taheri¹, Moein Taghvaei¹, Sorin Siegler¹, Thomas P. Schae², Ahmad Najafi¹

¹ Drexel University, ² University of Pennsylvania

PS1 - 256 - Finite element analysis of bone remodeling induced by swelling anchors with heterogeneous properties

Amirreza Sadighi¹, Mehrangiz Taheri¹, Nolan Black¹, Jordan Stolle¹, Madeline Boyes², Sorin Siegler¹, Thomas P. Schae², Ahmad Najafi¹

¹ Drexel University, ² University of Pennsylvania

PS1 - 257 - Assessing the influence of hip dysplasia severity on function, mobility, and pain

Christina Bourantas¹, Madison Wissman¹, Molly Shepherd¹, Keith Lohse¹, John Clohisy¹, Michael Harris¹

¹ Washington University in St. Louis

PS1 - 258 - Differences in yield stress and stiffness of the iliofemoral ligament associated with normal and high BMI

Ana Figueroa¹, Jacob Elkins¹, Marc Brouillette¹, Silvana Velasquez-Marin¹, Victoria Tappa¹, Jessica Goetz¹

¹ University of Iowa

PS1 - 259 - Three dimensional printed femoral diaphyses for flexural biomechanical testing: printer variability and validation

Omar Manzur¹, Kishore Nagaraja², Blaine Oldham¹, Richard Samade¹, Robert Weinschenk¹, Wei Li²

¹ University of Texas Southwestern Medical Center, ² University of Texas at Dallas

PS1 - 260 - Cervical hard collar immobilization: evaluating dynamic intervertebral kinematics

M. Zino Kuhn¹, Clarissa M. Levasseur¹, Adam Almoukamal¹, Aditya Padmanabhan¹, Eleanor Roberts¹, Rishabh Shetty¹, Andrew Sudar¹, William Anderst¹

¹ University of Pittsburgh

PS1 - 261 - Are favorable patient-reported outcomes 3 months after anterior cruciate ligament reconstruction associated with interlimb loading symmetry at 6 months?

Abdulmajeed Alfayyadh¹, Jack Williams², Kelsey Neal³, Ashutosh Khandha⁴, Kurt Manal⁴, Lynn Snyder-Mackler⁴, Thomas S. Buchanan⁴

¹ Jounf University, ² Northern Arizona University, ³ University of New Mexico School of Medicine, ⁴ University of Delaware

PS1 - 262 - Improvement of knee adduction moment and function following six-week off-axis stepping training for knee osteoarthritis

Raziyeh Baghi¹, Wei Yin², Giovanni Oppizzi³, Li-Qun Zhang¹

¹ University of Maryland, Baltimore, ² New Jersey Institute of Technology, ³ University of Maryland, College Park

PS1 - 263 - Patellofemoral contact forces during different types of walking in adults with and without knee osteoarthritis

Sharf Daradkeh¹, John Willson², Gretchen Salsich¹, Joshua Stefanik³, Patrick Corrigan⁴

¹ Saint Louis University, ² East Carolina University, ³ Northeastern University, ⁴ Cleveland Clinic

PS1 - 264 - Weight-bearing asymmetry patterns during squatting after fibular free flap harvest

Adam Bunn¹, Madeline Grosklos², Michelle Lockwood³, Gaeryn Salverda⁴, Courtney Butowicz⁵, Trevor Kingsbury⁴, Marisa Pontillo²

¹ Amputation Center for Excellence, ² Amputation Center of Excellence, ³ Amputation Center of Excellence, ⁴ Naval Medical Center, San Diego, ⁵ DoD-VA EACE

PS1 - 265 - In vivo assessment of patellar tendon loading during Basas Spanish squats with neuromuscular electrical stimulation

Jack Felipe¹, Claudia Kacmarcik¹, Joao Durigan², Karin Grävare Silbernagel¹, Stephanie Cone¹

¹ University of Delaware, ² Universidade de Brasília

PS1 - 266 - Pre-intervention kinesiophobia and self-reported knee function do not predict post-intervention load symmetry improvement after total knee arthroplasty in patients who received physical activity and symmetry (PAS) and control intervention

Vaibhavi Rathod¹, Liubov Arbeeva², Carla Hill², Katie Huffman², Todd Schwartz², Kelli Allen², Robin Queen¹

¹ Virginia Polytechnic Institute and State University, ² University of North Carolina at Chapel Hill

PS1 - 267 - No differences in drop vertical jump biomechanics at seven years when lateral extra-articular tenodesis is added to ACL reconstruction in young active patients: a sub-analysis of the Stability RCT

Richard Magony¹, Jane Thornton¹, Dianne Bryant¹, Alan Getgood¹, Derek Pamukoff¹

¹ Western University

PS1 - 268 - Impact of graft type on load symmetry and physical performance following ACL reconstruction

Vaibhavi Rathod¹, Pang Du², Laura Sands¹, Kevin Ford³, Joseph Hart⁴, Robin Queen¹

¹ Virginia Polytechnic Institute and State University, ² Department of Statistics, ³ High Point University, ⁴ University of North Carolina at Chapel Hill

PS1 - 270 - Associations between PEDI-IKDC, hopping, and isokinetic torque in adolescents 6 to 12 months post-ACL reconstruction

Kalpaka Pradip¹, Caroline Lisee¹, Chris Kuenze², Adam Weaver³

¹ University of Georgia, ² University of Virginia, ³ Connecticut's Children Sports Physical Therapy

PS1 - 271 - The accuracy of manual clinical exams for detecting lumbar spine instability during flexion/extension

Caitlyn Johnson¹, Clarissa M. Levasseur¹, M. Zino Kuhn¹, Gina Mckernan¹, Sara Piva¹, William Anderst¹

¹ University of Pittsburgh

PS1 - 272 - Pre-treatment impairments define rotator cuff tendinopathy phenotypes that respond differently to exercise rehabilitation

Oscar Vila Dieguez¹, Chethan Reddy¹, Lori Michener¹, Matthew Heindel¹

¹ University of Southern California

PS1 - 273 - Are affected limb joint powers associated with physical activity in people with knee osteoarthritis?

Oiza Peters¹

¹ University of Illinois at Chicago

PS1 - 274 - Proximal femur bone strength in persons with spinal cord injury: development of a computational framework to simulate sideways fall from a wheelchair

Anmol Doss¹, William Kuo¹, Christopher Ciriogliaro², William A. Bauman³, Saikat Pal¹

¹ New Jersey Institute of Technology, ² James J. Peters Veterans Affairs Medical Center, ³ Icahn School of Medicine at Mount Sinai

PS1 - 275 - The relationship between foot posture, dorsiflexion range of motion and lower extremity biomechanics during a drop-landing task

Kendra Graham¹

¹ University of Tennessee

PS1 - 276 - Impact of sports specialization on load symmetry during unilateral and bilateral landings after anterior cruciate ligament reconstruction

Renoa Choudhury¹, Joseph Hart², Kevin Ford³, Robin Queen¹

¹ Virginia Polytechnic Institute and State University, ² University of North Carolina at Chapel Hill, ³ High Point University

PS1 - 277 - Single leg crossover drop provides distinctive cluster of risk for secondary ACL injury

Jacob Connolly¹, Lauren Luginsland¹, Nathan Schilaty¹, Aaron Krych², Nathaniel Bates³

¹ University of South Florida, ² Mayo Clinic, ³ Ohio State University

PS1 - 278 - Exploring the effect of propulsive ground reaction force biofeedback on baseball pitching biomechanics

Dimitri Haan¹, Brian Knarr¹, Adam Rosen¹, Sam Wilkins¹

¹ University of Nebraska at Omaha

PS1 - 279 - Kinematic and kinetic differences in trunk rotational velocity and trunk tilt

Brandon Muczynski¹, Brian Knarr¹, Adam Rosen¹, Sam Wilkins¹

¹ University of Nebraska at Omaha

PS1 - 280 - Evaluating fastball biomechanical responses to cumulative pitch count: a comparison of n-of-1 and group modeling approaches

Garrett Fernandez¹, Kristen Nicholson¹, Garrett Fernandez¹
¹ Wake Forest University School of Medicine

PS1 - 281 - Comparison of three landing tasks and their ability to predict likelihood of secondary ACL injury

Lauren Luginsland¹, Jacob Connolly¹, Nathan Schilaty¹, Aaron Krych², Nathaniel Bates³
¹ University of South Florida, ² Mayo Clinic, ³ Ohio State University

PS1 - 282 - BCMJ variables mean power and concentric impulse correlate to fastball velocity

Yasmine Jutt¹
¹ Marshall University

PS1 - 283 - Analysis of peak hamstring length during decelerative running

Andrew Polson¹, Ryan Culin¹, Reed Gurchiek¹
¹ Clemson University

PS1 - 284 - Sex-specific effects of eccentric strength training on lower-limb sprinting kinematics

Samantha Kahr¹, Jack Martin¹, Scott Crawford¹
¹ University of Wisconsin – Madison

PS1 - 285 - Plantarflexion/dorsiflexion in ballet sautés: A multi-segment foot analysis

Kathleen Bieryla¹, Glenna Clifton¹
¹ University of Portland

PS1 - 286 - Increasing neurocognitive task complexity in a run to cut maneuver: understanding the influence on knee biomechanics and implications for anterior cruciate ligament injury

Katherine Perille¹
¹ University of Tennessee

PS1 - 287 - Strategy to step on obstacle safely during cross-country race

Emanuela Kang¹, Jan Karel Petric², Sophia Ulman²
¹ Hockaday School, ² University of Texas Southwestern Medical Center

PS1 - 288 - Comparison of joint contributions to total support moment during single-leg hopping between collegiate male athletes with neutral versus low arch heights

Brandi Decoux¹, Christopher Wilburn², Amber Stockton¹, Wendi Weimar²
¹ Southeastern Louisiana University, ² Auburn University

PS1 - 289 - Effect of cognitive motor interference on landing and jumping kinematics following anterior cruciate ligament reconstruction

Alexander Morgan¹, Jacob Petrus¹, Alek Johnson¹, Justin Blankenburg², Aaron Harris¹, Aaron Montgomery¹, Ryan Guggenheim¹, Harry Costlow¹, Bailey Hall¹, John Abt³, Jacob Calcei⁴, James Voos⁴, John Polousky⁵, Melanie Morscher⁵, Jennifer Kadlowec¹, Patrick Ledwidge⁶
¹ Baldwin Wallace University, ² Kent State University, ³ Children's Health Andrews Institute for Orthopaedics & Sports Medicine, ⁴ University Hospitals Department of Orthopaedic Surgery, ⁵ Akron Children's Hospital Department of Orthopaedics, ⁶ Western Kentucky University

PS1 - 290 - Lower-body power generation and pitching velocity: Insights from joint torque power

Takato Ogasawara¹, Adam Rosen¹, Sam Wilkins¹, Brian Knarr¹
¹ University of Nebraska at Omaha

PS1 - 291 - Assessing interrelationships between individual hamstring muscle volumes

Jack Martin¹, Silvia Blemker², David Opar³, Bryan Heiderscheit¹
¹ University of Wisconsin – Madison, ² Springbok Analytics, ³ Australian Catholic University

POSTER SESSION 2

Friday, August 15, 2025

PS2 - 1 - Dual-task cost of sit-to-walk in older adults: preliminary results

Gu Eon Kang¹

¹ University of Texas at Dallas

PS2 - 2 - Effects of visual complex cues on temporal stepping mechanics

Ruba Alraqibah¹, Erika Pliner¹, Peter Fino¹, Nooshin Seddighi¹

¹ University of Utah

PS2 - 3 - Evaluating obstacle course walking as a form of clinical testing for gait metrics

Norah Stivala¹, Galen Holland¹, Michelle Harter¹, Ethan Hicks¹, Amanda Bicket², Mark Redfern¹, Rakie Cham¹

¹ University of Pittsburgh, ² University of Michigan

PS2 - 4 - The effects of repetitive head impacts on postural control in mature adults

Caitlin Gallo¹, Christopher Knight¹, Jeremy Crenshaw¹, Tiphane Raffeeau², Melissa Anderson³, Thomas Buckley¹

¹ University of Delaware, ² George Mason University, ³ Ohio University

PS2 - 5 - What can 400 miles of overground walking tell us about the individuality of gait?

Tyler Wiles¹, Seung Kyeom Kim¹, Nick Stergiou¹, Aaron Likens¹

¹ University of Nebraska at Omaha

PS2 - 6 - AI-based wearable gait analysis for proactive fall risk prediction

Nathaniel Im¹

¹ Portsmouth Abbey School

PS2 - 7 - Influence of obesity on walking stability control in older adults

Nancy Nguyen¹, Carrie Earthman¹, Jocelyn Hafer¹, John Jeka¹, Noah Rosenblatt², Jeremy Crenshaw¹

¹ University of Delaware, ² Rosalind Franklin University of Medicine

PS2 - 8 - Correlations of objective measures of gait with clinical and subjective measures

Chitra Banarjee¹, Patria Marcano Maldonado¹, Hwan Choi¹, Md Sanzid Bin Hossain¹, Rui Xie¹, Ladda Thiamwong¹

¹ University of Central Florida

PS2 - 9 - Directional stability: A new presentation of the Margin of Stability during walking

Sydney Garrah¹, Amy Coyle¹, Richard Moulton¹, Scott Selbie¹

¹ Has-Motion Inc

PS2 - 10 - The effects of foot-ankle work on margin of stability differ by age and walking slope

Paula Kramer¹, Aubrey Gray², Kota Takahashi¹, Jason Franz³, Peter Fino¹

¹ University of Utah, ² University of North Carolina at Chapel Hill & North Carolina State University, ³ North Carolina State University

PS2 - 12 - Sensor-based tracking game to assess proprioceptive deficits in older adults

Monica Hruzd¹, Kubra Akbas², Mohammad Hosseinalizadeh¹, Nima Toosizadeh²

¹ Rutgers School of Graduate Studies, ² Rutgers University

PS2 - 13 - Total hip arthroplasty and static postural balance: a pre- and post-operative analysis

Danielle Peters¹, Sheryl Bourgaize², Alyssa Tondat¹, Emiko Arshad¹, Marina Mourtzakis¹, Tina Mah³, Matthew Snider⁴, Paul Grosso⁴, Brandon Girardi⁴, Oliver Gauthier-Kwan⁴, Stephanie Nemirov⁴, Carla Girolametto⁴, Kailyn Clarke⁴, Andrew Laing¹

¹ University of Waterloo, ² Cape Breton University, ³ Schlegel-University of Waterloo Research Institute for Aging, ⁴ Grand River Hospital

PS2 - 14 - Personalized sonified biofeedback for older adults to improve turning gait: A pilot study

Zahava Hirsch¹, Jun Liu¹, Erin Kreis¹, Antonia Zaferiou¹

¹ Stevens Institute of Technology

PS2 - 15 - Obesity increases fall risk in older adults following a standing-slip

Jiyun Ahn¹

¹ Georgia State University

PS2 - 16 - Effects of prolonged walking on toe clearance and stability margins in older adults

Nancy Nguyen¹, Fany Alvarado¹, Millissia Murro¹, Grace Kellahe¹, Mayumi Wagatsuma¹, Jocelyn Hafer¹, Jeremy Crenshaw¹

¹ University of Delaware

PS2 - 18 - Sustainability framework applied to biomechanics course modules to motivate opportunities and collaboration

Eric Meyer¹

¹ Lawrence Technological University

PS2 - 19 - Measured effects of stack height, drop, and midsole hardness on gait: minimalist shoes increase cadence, single limb support, and stance phase duration in adults over 50.

Keven Santamaria-Guzman¹, Damaris Cifuentes¹, Kenneth Harrison¹, Brandon Peoples¹, Silvia Campos-Vargas¹, Bria Smith¹, Jaimie Roper¹

¹ Auburn University

PS2 - 20 - Mobility outcomes in older adults with and without carbon fiber insole

Rohit Kundu¹, Daniel Davis¹, Jason Franz², Paul Estabrooks¹, Kota Takahashi¹

¹ University of Utah, ² North Carolina State University

PS2 - 21 - Reduced toe-off angle using at-home footwear: implications for fall risk in older adults

Damaris Cifuentes¹, Keven Santamaria-Guzman¹, Brandon Peoples¹, Silvia Campos-Vargas¹, Kenneth Harrison¹, Bria Smith¹, Jaimie Roper¹, Francisco Siles², Eduardo Santiago²

¹ Auburn University, ² Universidad De Costa Rica

PS2 - 22 - Are altered knee joint forces a contraindication for the use of carbon fiber insoles to enhance walking performance in older adults?

Elizabeth Bjornsen¹, Aubrey Gray², Chase Aiken³, W. Zachary Horton⁴, Brian Pietrosimone¹, Kota Takahashi⁵, Jason Franz³

¹ University of North Carolina at Chapel Hill, ² University of North Carolina at Chapel Hill & North Carolina State University, ³ North Carolina State University, ⁴ University of California, Santa Cruz, ⁵ University of Utah

PS2 - 23 - Efficacy of therapeutic shoes in reducing plantar pressure in patients with foot pain

Krista Samreth¹, Hafizur Rahman², Elnaaz Eskandari³, Karishma Sebastain⁴, Luis Venegas², Javier La Fontaine², Sabrina Wrinkler²

¹ UTRGV School of Podiatric Medicine, ² University of Texas Rio Grande Valley, ³ University of Texas at Rio Grande Valley, ⁴ School of Podiatric Medicine

PS2 - 24 - MDS-UPDRS Section III score prediction using neural network approach with mobile phone application data

Seonghyeon Hwang¹, Kiwon Park¹, Jeongsik Kim¹, Ryeongah Kim¹, Ryul Kim²

¹ Incheon National University, ² Dept. of Neurology, SMG-SNU Boramae Medical Center, Seoul National University College of Medicine,

PS2 - 25 - Concurrent assessment of markerless and marker-based motion capture for kinematics and kinetics during functional activities in knee osteoarthritis

Rhodora Therese Torres¹, Benjamin Senderling², Ehyun Kim¹, Michael Rose³, Tuhina Neogi¹, Deepak Kumar¹

¹ Boston University, ² Drexel University, ³ University of California, Los Angeles

PS2 - 26 - Physics-informed statistical shape model for geometry prediction of nonunion scaphoid fractures

Junjun Zhu¹, Weimin Zhu²

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PS2 - 27 - Validation of AI-driven markerless motion capture system for spatiotemporal gait analysis in stroke survivors

Balsam Alammari¹, Brandon Schoenwether¹, Zachary Ripic¹, Neva Kirk-Sanchez¹, Moataz Eltoukhy¹, Lauri Bishop¹

¹ University of Miami

PS2 - 28 - Concurrent validity of a markerless motion capture system for the maximal instep soccer kick

Ivan Palomares-Gonzalez¹, Arnel Aguinaldo², Brent Alvar¹, Jacob Goodin¹

¹ Point Loma Nazarene University, ² Point Loma Nazarene University

PS2 - 29 - Wearable IMU ground reaction force estimation via hybrid GRU model

Zakir Ullah¹, Zach Strout², Dong Wang³, Peter Shull¹

¹ Shanghai Jiao Tong University, ² SageMotion, ³ School of Mechanical Engineering

PS2 - 31 - A real-time algorithm for detecting gait events in lower-limb prosthesis users using a markerless motion capture system

Liang-Wei Huang¹, Mu-Hua Wang¹, Bo-Hung Chen¹, Kai-Han Su¹, Cheng-Hung Tsai², You-Yin Chen¹, Hui-Ting Shih¹

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PS2 - 32 - Utilizing reinforcement learning to overcome the challenge of muscle specific EMG placements for musculoskeletal models

Reilly Stafford¹, Katherine Saul¹, Helen Huang¹

¹ North Carolina State University

PS2 - 33 - Dynamic mode decomposition identifies dominant medial collateral ligament strain patterns under knee loadings.

William Gamble¹, Patrick Smolinski¹, Mark Carl Miller¹, Anja Wackerle², Armin Runer², Michael Dinenna¹, Michael Smolinski¹, Volker Musahl¹

¹ University of Pittsburgh, ² Technical University of Munich

PS2 - 34 - Clustering IMU data of patients with spinal sagittal imbalance using machine learning

Sadegh Madadi¹, Mostafa Rostami², Hadi Farahani³, Farshad Nikouee⁴, Mohammad Samadian⁵, Ram Haddas⁶

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PS2 - 35 - Using IMU data and unsupervised learning to predict outcomes in spinal sagittal imbalance surgery

Sadegh Madadi¹, Mostafa Rostami², Hadi Farahani³, Farshad Nikouee⁴, Mohammad Samadian⁵, Ram Haddas⁶

¹ Amirkabir University of Technology, Faculty of Biomedical Engineering, Tehran, Iran, ² Amirkabir University of Technology, ³ Shahid Beheshti University, ⁴ Iran University of Medical Sciences, ⁵ Shahid Beheshti University of Medical Sciences, ⁶ Texas Back Institute

PS2 - 36 - Videos capture functional strength deficits following ACL reconstruction

Zhixiong Li¹, Chaeun Lee¹, Kunwoo Lee¹, Evy Meinders¹, Andrew Sprague², James Irrgang², Volker Musahl², Eni Halilaj¹

¹ Carnegie Mellon University, ² University of Pittsburgh

PS2 - 37 - Upper extremity virtual reality motion capture using machine learning

Skyler Barclay¹, Trent Brown¹, Tessa Hill², Allison Kinney¹, Timothy Reissman¹, Ann Smith², Megan Reissman¹

¹ University of Dayton, ² Dayton Children's Hospital

PS2 - 38 - Video-based analysis for estimating knee impact angle during a fall using pose-estimation

Reese Michaels¹, Yaejin Moon¹

¹ Syracuse University

PS2 - 39 - Identifying the optimal number and location of IMU sensors to classify older adults at high risk of a fall while walking

Junwoo Park¹, Kitaek Lim¹, Seyoung Lee¹, Jongwon Choi¹, Woochol Choi¹

¹ Yonsei University

PS2 - 40 - Real-world evaluation of a laboratory-based fall detector for lower limb amputees

Seyedmojtaba Mohasel¹, Corey Pew¹, Richar Neptune²

¹ Montana State University, ² University of Texas at Austin

PS2 - 41 - Periodic autoencoder for injury designation using marker position

Alex Dzewaltowski¹, Christopher Connaboy¹

¹ Rosalind Franklin University of Medicine

PS2 - 42 - Machine learning-based sex-specific prediction of fatigue during running using inertial measurement unit sensors

Yiyang Chen¹, Oussma Jlassi¹, Jill Emmerzaal¹, Caroline Paquette¹, Julie Cote¹, Philippe Dixon¹

¹ McGill University

PS2 - 43 - Quantifying artificial turf stiffness using wearable sensors and machine learning

Jake Ruschkowski¹, John Wannop¹, Brent Edwards¹, Danielle Whittier¹, Reed Ferber¹

¹ University of Calgary

PS2 - 44 - Lightweight real-time human activity recognition approach using biomechanical features

Ehsan Sharafian Moghaddam¹, Colby Ellis², Babak Hejrati³

¹ PhD student, ² University of North Carolina at Chapel Hill, ³ University of Maine

PS2 - 45 - Pseudo-targets as a preselection method for feature engineering in continuous activities

Louis Dankovich Iv¹, Andrew Tweedell², Chloe Callahan-Flintoff¹, Richard Diego³

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PS2 - 46 - Evaluating Stride rate and ground time accuracy in running using Monocular pose estimation.

Luke Vankeersbilck¹, Iain Hunter¹

¹ Brigham Young University

PS2 - 47 - Artificial intelligence-based virtual surveillance: forecasting biomechanical wall stress and 3D surface geometry of abdominal aortic aneurysms

Aakash Kottakota¹, Jason Lee¹, Pete Gueldner¹, Nathan Liang¹, David Vorp¹, Timothy Chung²

¹ Bioengineering, ² University of Pittsburgh

PS2 - 48 - Effects of slope gradient on the contribution of joints to destabilization of gaits

Jungho Lee¹, Chae Lynne Kim¹, Jeongin Moon¹, Joeeun Ahn¹
¹ Seoul National University

PS2 - 51 - The relationship between assistance torque and muscle activity during lifting with Back-Support Exoskeletons

Amir Mehdi Shayan¹, Zeinab Kazemi¹, Divya Srinivasan¹
¹ Clemson University

PS2 - 52 - Evaluation of the effects of spring stiffness in knee aids on the knee joint loading

John Wu¹, Kevin Moore¹, Liying Zheng¹, Ting Xia²
¹ National Institute for Occupational Safety and Health, ² Northern Illinois University

PS2 - 53 - Robotic pneumatic shoes elicit adaptations to weight bearing symmetry during walking

Mark Price¹, Sarah Szemethy¹, Wouter Hoogkamer¹, Meghan Huber¹
¹ University of Massachusetts Amherst

PS2 - 54 - Robotic ankle exoskeleton reduces ankle muscle demand during walking in peripheral artery disease

Farahnaz Fallahtafi¹, Zahra Salamifar¹, Iraklis Pipinos², Sara Myers¹
¹ University of Nebraska at Omaha, ² Nebraska-western Iowa Veterans Affairs Medical Center

PS2 - 55 - Biomechanical evaluation of hip protectors and compliant flooring: A systematic review and qualitative analysis

Kitaek Lim¹, Seyoung Lee¹, Junwoo Park¹, Woochol Choi¹
¹ Yonsei University

PS2 - 56 - Can virtual neuromuscular exoskeleton torque provide speed-adaptive gait assistance?

Rish Rastogi¹, Seungmoon Song¹, Max Shepherd¹
¹ Northeastern University

PS2 - 57 - Joint power responses of individuals post-stroke walking with a powered hip exoskeleton with different limb assistance strategies

Kristen Stewart¹, Gregory Sawicki², Aaron Young², Richard Neptune¹
¹ University of Texas at Austin, ² Georgia Institute of Technology

PS2 - 58 - Biomechanical effects of varying assistance magnitude during level-ground and ramp-ascent locomotion using a robotic hip exoskeleton

Jimin An¹, Inseung Kang¹, Eni Halilaj¹
¹ Carnegie Mellon University

PS2 - 59 - Towards simulation-based exoskeleton control design and optimization

Calder Robbins¹, Chun Kwang Tan¹, Seungmoon Song¹
¹ Northeastern University

PS2 - 60 - Optimizing lower-limb exoskeleton assistance through subject-specific predictive gait simulations: torque profiles and metabolic cost savings

Neethan Ratnakumar¹, Xianlian Zhou¹
¹ New Jersey Institute of Technology

PS2 - 61 - Changes in physiological biomarkers during gait adaptation to hip vs. ankle exoskeletons

Hansol Ryu¹, Dongho Park¹, Kennedy Kerr², Amro Alshareef¹, Hangeol Song¹, Aaron Young¹, Gregory Sawicki²
¹ Georgia Institute of Technology, ² Emory University

PS2 - 62 - Metabolic differences in gait adaptation to an ankle vs. hip exoskeleton

Kennedy Kerr¹, Hansol Ryu², Dongho Park², Amro Alshareef², Hangeol Song², Aaron Young², Gregory Sawicki²
¹ Emory University, ² Georgia Institute of Technology

PS2 - 63 - Effects of body weight support on center of mass kinematics during infant crawling

Tristan Mccarty¹, Leah Nguyen¹, James Galloway², Elena Kokkoni¹
¹ University of California, Riverside, ² Baylor University

PS2 - 64 - Quantifying nonlinear ankle quasi-stiffness behavior during sloped walking

Emma Caringella¹, Kota Takahashi¹
¹ University of Utah

PS2 - 65 - Characterizing the dynamic stiffness of twisted and coiled artificial muscles for powered ankle-foot orthoses

George Elias¹, Jason Wilken¹, Deema Totah¹, Kirsten Anderson¹, Braeden Harrell¹, Caterina Lamuta¹, Katherine Vaiciulis¹
¹ University of Iowa

PS2 - 66 - Effects of asymmetric stiffness walking on joint kinematics and kinetics

Leah Metsker¹, Mark Price¹, Elena Schell¹, Jenna Chiasson¹, Jonaz Moreno¹, Meghan Huber¹, Wouter Hoogkamer¹

¹ University of Massachusetts Amherst

PS2 - 67 - The benefits of gait retraining with vibrotactile feedback outweigh higher perceived mental load

Vani Hiremath Sundaram¹, Nataliya Rokhmanova², Eni Halilaj³, Katherine J. Kuchenbecker¹

¹ Max Planck Institute for Intelligent Systems, ² Motive Labs, ³ Carnegie Mellon University

PS2 - 68 - Haptic cueing modulates gait variability and is more user friendly than visual cues

Kolby Brink¹, Mehrnoush Haghighatnejad², Tyler Wiles¹, Nick Stergiou¹, Aaron Likens¹

¹ University of Nebraska at Omaha, ² University of Nebraska Omaha

PS2 - 69 - Estimating knee joint impedance across varying walking speeds for adaptive continuous impedance control in powered knee prostheses

Woolim Hong¹

¹ North Carolina State University

PS2 - 70 - Pairing limb angle biofeedback with an ankle exoskeleton to augment propulsion in individuals with chronic hemiparesis

Steven Thompson¹, Emily Foley¹, Sonia Wrobel¹, Jason Franz², Gregory Sawicki³, Michael Lewek¹

¹ University of North Carolina at Chapel Hill, ² North Carolina State University, ³ Georgia Institute of Technology

PS2 - 71 - Comparing the transfer of treadmill-based and overground-based exosuit training toward overground gait

Sangwon Shin¹, Pieter Van Den Berghe¹, Mukul Mukherjee², Philippe Malcolm²

¹ University of Nebraska Omaha, ² University of Nebraska at Omaha

PS2 - 72 - Development of an active wheelchair seat cushion to address pressure injuries

Evelyn Ochoa Arias¹, Diane Gonzalez¹, Natalie Taylor¹, Patricia Richards¹, Jason Robinson¹, Jooyoung Hong¹, Elizabeth Hsiao-Wecksler¹, Holly Golecki¹, Joohyung Kim¹, Laura Rice¹, J. J. Guedet², Matthew Nieukirk², Emily Pisani², Mary Schopp², Britny Coyle², Christopher Zallek²

¹ University of Illinois at Urbana-Champaign, ² OSF HealthCare

PS2 - 73 - Accurate assessment of passive impairment coupling across five digits post stroke

Giovanni Oppizzi¹, Soh-Hyun Hur², Dali Xu², Xiaoyan Li¹, Derek Kamper³, Li-Qun Zhang¹

¹ University of Maryland, College Park, ² University of Maryland, Baltimore, ³ North Carolina State University

PS2 - 74 - Robotic ankle exoskeleton enhances ground reaction forces in patients with peripheral artery disease

Zahra Salamifar¹, Farahnaz Fallahtafti¹, Jania Williams¹, Iraklis Pipinos², Sara Myers¹

¹ University of Nebraska at Omaha, ² Nebraska-western Iowa Veterans Affairs Medical Center

PS2 - 75 - Higher levels of assistance from an ankle exoskeleton decrease heart rate but increase tibialis anterior fatigue ratio

Janja Williams¹

¹ University of Nebraska at Omaha

PS2 - 76 - How hospital room design impacts gait in older adults

Nooshin Seddighi¹, Oliver Rhodes¹, Junseop Son¹, Rebecca Go², K. Bo Foreman¹, Ellen Taylor³, Bob Wong¹, Peter Fino¹

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PS2 - 77 - Heavy lifts, small bodies: the influence of task and weight in infant lifting mechanics

Safeer Siddicky¹, Melvin Leon², Kathryn Havens²

¹ University of Texas at Austin, ² University of Southern California

PS2 - 78 - Leg length and waist-to-height ratio are associated with foot placement location while climbing down a ladder

Sarah Griffin¹, Kurt Beschorner¹

¹ University of Pittsburgh

PS2 - 79 - The kinematics and kinetics of unexpected ladder slip events

Violet Williams¹, Sarah Griffin¹, Mark Redfern¹, Kurt Beschorner¹

¹ University of Pittsburgh

PS2 - 81 - Weight shifts as a marker of discomfort during prolonged sitting

Krista Dronzek¹, Rutuja Kulkarni¹, April Chambers¹

¹ University of Pittsburgh

PS2 - 82 - Validation of an IMU and pressure insole motion tracking system across stoop and squat lifting postures

Vicki Wang¹, Rutuja Kulkarni¹, Alicia Koontz²

¹ University of Pittsburgh, ² Human Engineering Research Laboratories

PS2 - 83 - Center of pressure analysis of perception to falling objects

Sophie Pearson¹, Erika Pliner¹

¹ University of Utah

PS2 - 84 - Age and knee extension strength are associated with ladder climbing strategy

Luke Snyder¹, Sarah Griffin¹, Kurt Beschoner¹

¹ University of Pittsburgh

PS2 - 87 - Effects of ladder rung design on available coefficient of friction during forward and lateral slip testing

Jaspreet Chera¹, Madison Flaugh¹, Violet Williams¹, Richard Smith¹, Kurt Beschoner¹

¹ University of Pittsburgh

PS2 - 88 - Visual gaze during ladder climbing: effect of climbing direction

Jared Kolarcik-Schmitt¹, Sarah Griffin¹, Rakie Cham¹, Kurt Beschoner¹

¹ University of Pittsburgh

PS2 - 89 - Development of a walking technique to reduce barefoot walking impact

Yunbeom Nam¹, Taehyung Kim¹, Kanghyeon Lee¹, Gwanseob Shin¹

¹ Ulsan National Institute of Science and Technology (UNIST)

PS2 - 90 - Comparing whole body center-of-mass kinematics between a smartphone-based system and traditional motion capture

Jian Zhang¹, Julie Ferrell-Olson¹, Andrew Sawers¹

¹ University of Illinois at Chicago

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Vimal Chander¹, Manivannan M²

¹ Indian Institute of Technology Madras, ² IIT Madras

PS2 - 92 - Stepping stone walking alters early stance and swing phase sagittal knee kinematics

Brandon Peoples¹, Bella Helm¹, Grant Renfrow¹, Jacob Jerkins¹, Kenneth Harrison¹, Keven Santamaria-Guzman¹, Jaimie Roper¹

¹ Auburn University

PS2 - 93 - Visual context affects lateral balance while walking on winding paths

Anna Render¹, Tarkeshwar Singh¹, Joseph Cusumano¹, Jonathan Dingwell¹

¹ Pennsylvania State University

PS2 - 94 - Mediolateral dynamic postural stability during stair ascents in individuals with a rotationplasty about the knee

Kellen Krajewski¹, Amanda Vinson², Mia Lundin¹, Nathan Rogers¹, Susan Kanai², Lucas Moore², James Carollo², Steven Thorpe¹, Anna Silverman³, Nathan Donaldson¹

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PS2 - 95 - The effect of prosthetic foot stiffness on stability and balance confidence during walking in lower limb prosthesis users

Tyler Ho¹, Elizabeth Halsne², Andrew Sawers³, Sara Koehler-McNicholas⁴, Andrew Hansen⁴, Alexandria Lloyd⁴, Juan Cave⁴, Nicole Schaumann⁴, Christina Carranza¹, David Morgenroth²

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³ University of Illinois at Chicago, ⁴ Minneapolis VA Health Care System

PS2 - 96 - Effects of different cueing strategies on sit-to-walk in individuals with Parkinson's disease

Naghmeh Gheidi¹, Ying Fang², Thomas Kernozek¹

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PS2 - 97 - Characterizing center of mass control during gait in persons with motor incomplete spinal cord injury: A statistical parametric mapping analysis

Oliver Daliat Iv¹, Charles Creech², Edelle C. Field-Fote¹

¹ Shepherd Center, ² Georgia Institute of Technology

PS2 - 98 - Center of mass control is significantly impacted by intra-limb coordination in people with motor incomplete spinal cord injury

Charles Creech¹, Oliver Daliat Iv², Edelle C. Field-Fote²

¹ Georgia Institute of Technology, ² Shepherd Center

PS2 - 99 - Gait parameters related to dynamic balance and bilateral temporal coordination improve with sleep extension, but are not affected by motor dual tasking in young adults

Bria Smith¹, Kenneth Harrison¹, Brandon Peoples¹, Meral Culver¹, Keven Santamaria-Guzman¹, Silvia Campos-Vargas¹, Austin Robinson², Jaimie Roper¹

¹ Auburn University, ² Indiana University

PS2 - 100 - Locomotor adaptations to predictable and unpredictable balance perturbations in people with chronic stroke

Ashley Maloney¹, Keith Gordon¹, Shamali Dusane², Anna Shafer³, Heather Henderson¹

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PS2 - 101 - Test equivalence on dynamic and static balance systems

Kiara Barrett¹, Neha Kapoor¹, Megan Cotterman¹, Kristinn Heinrichs¹, Kamran Barin¹

¹ Bertec Corporation

PS2 - 102 - Assessment of rifle and posture synchronization metrics for detecting threat engagement readiness postures

Leah Enders¹, Michael Nonte²

¹ U.S. Army DEVCOM Army Research Laboratory, ² DCS Corporation

PS2 - 103 - Effects of cold-water immersion on shivering magnitude and postural stability

Amy Schwartz¹, Douglas Jones¹, Rebecca McClintock¹, Rebecca Weller¹, Tony Duong¹, Amy Silder¹

¹ Naval Health Research Center

PS2 - 104 - The misuse of biomechanical evidence in shaken baby cases

Barbara Billauer¹

¹ Institute of World Politics

PS2 - 106 - A preliminary review of infant cranium development during the first six months of life

Shameka Kimmel¹

¹ Boise Applied Biomechanics of Infants

PS2 - 107 - Pilot summer research program: high school students explore biomechanics at UT Dallas

Gu Eon Kang¹

¹ University of Texas at Dallas

PS2 - 108 - Framework for development, evaluation, and translation of biomechanics curriculum

Kayla Pariser¹, Amy Trauth², Margo Donlin³, Laurie Dearolf⁴, Amelia Lanier-Knarr⁵, Jill Higginson¹, Jenni Buckley¹

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PS2 - 109 - Broadening participation for biomechanics: impact of an NSF-funded travel award

Kurt Beschorner¹, Anna Bailes², Christopher Wilburn³, Allison Altman-Singles⁴

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PS2 - 110 - Empowerment in motion: a collaborative mentoring program for underrepresented scholars in biomechanics

Edward Ofori¹, Jazmin Cruz², Jordan Barajas¹, Elisa Romero Avila³, Tiphonie Raffegau⁴

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PS2 - 111 - Undergraduate experiential learning through biomechanics curriculum design

Kayla Pariser¹, Amy Trauth², Amy Posch³, Amelia Lanier-Knarr⁴, Jill Higginson¹, Jenni Buckley¹

¹ University of Delaware, ² American Institutes for Research, ³ Sawbones - Pacific Research Labs, ⁴ The Perry Initiative

PS2 - 112 - Pre-conference activities for biomechanics trainees: Impact of NSF funded programming

Anna Bailes¹, Sarah Hemler², Kurt Beschorner²

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PS2 - 113 - Why mentor undergraduate researchers in biomechanics?

David Phillips¹, Jacob Hinkel-Lipsker², Craig Goehler³, Allison Altman-Singles⁴, Michael Potter⁵, Mukul Talaty⁶, Brooke Odle⁷, Kim Bigelow⁸

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PS2 - 114 - Integrating FTIDR-based pressure mapping and real-time visualization in force distribution

Debadutta Subudhi¹, Vimal Chander², Manivannan M¹

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PS2 - 115 - Do stiffer foot arches improve top sprint speed?

Kamen Wong¹, Hui Tang¹, Owen Beck¹

¹ University of Texas at Austin

PS2 - 117 - Wearing socks that stiffen foot arches reduce the metabolic cost of walking

Hui Tang¹, Owen Beck¹

¹ University of Texas at Austin

PS2 - 118 - Decreased lower-limb muscle activation in advanced footwear technology

Iain Hunter¹

¹ Brigham Young University

PS2 - 119 - The effects of advanced footwear technology on the metabolic cost and biomechanics of sub-elite and elite distance runners

Bradley Needles¹, Alena Grabowski¹

¹ University of Colorado Boulder

PS2 - 120 - How does surface stiffness and frequency affect leg stiffness and the metabolic cost of hopping?

Luis Morata¹, Alena Grabowski¹

¹ University of Colorado Boulder

PS2 - 121 - Barefoot versus flip-flop walking ground reaction forces

Emily Gerstle¹

¹ University of Scranton

PS2 - 122 - Simulating early stance footwear-ground interaction with an inverted pendulum for slip resistance assessment

Cédric Dessureault¹, Gaspard Diotalevi¹, Chantal Gauvin², François Martel¹, Nicolas Zabjesky¹, Cécile Smeesters¹, Denis Rancourt¹

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Richard Smith¹, Kurt Beschorner¹

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PS2 - 124 - FlyBand® ExoBoots allow for increased ankle range of motion during walking compared to conventional boots

Gabrielle Moser¹, Jania Williams², Corbin Rasmussen³, Farahnaz Fallahtafti², Keith Eriks⁴, Thomas Cotton⁴, Mark Roser⁴, Sara Myers²

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PS2 - 125 - Medial longitudinal arch stability assessment during midstance: Influence of diabetic peripheral neuropathy

Jessi Martin-Liddy¹, Georgeanne Botek², Ahmet Erdemir², Brian Davis³

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PS2 - 126 - The effect of ankle & hallux positioning on hallux force production: a case study of flexor hallucis longus

Mickelle Maccabe¹, Joshua K. Sponbeck²

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Halime Gulle¹, Jennifer Bergeron², Sarah Ridge³, Irene Davis⁴

¹ University of South Florida, ² Hartford University, ³ University of Hartford, ⁴ University of South Florida, Tampa, FL

PS2 - 129 - Effects of barefoot vs shod conditions on traditional and sumo deadlift techniques

Paige Agnew¹, Kevin Valenzuela², Zachary Sievert³, Hunter Bennett¹

¹ Old Dominion University, ² California State University, Long Beach, ³ University of Cincinnati

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Kathy Reyes¹

¹ Oregon State University

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Rebekah Pallone¹, Aymeric Feyfant¹, Bryan Conrad¹, Evan Day¹

¹ Brooks Sports, Inc.

PS2 - 132 - Vagus nerve stimulation paired with lower limb rehabilitation improves walking after chronic spinal cord injury: a pilot study

Spencer Dunbar¹, Emmanuel Adehunoluwa², Joseph Epperson², Rhys Switzer², Robert Rennaker², Michael Kilgard², Seth Hays²

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PS2 - 133 - Short walking trials produce reliable Hurst exponents

Vasileios Mylonas¹, Seung Kyeom Kim¹, Tyler Wiles¹, Nick Stergiou¹, Aaron Likens¹

¹ University of Nebraska at Omaha

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Madeline Groszklos¹, Adam Bunn², Marisa Pontillo¹

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Seung Kyeom Kim¹, Tyler Wiles¹, Nick Stergiou¹, Aaron Likens¹

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PS2 - 136 - Revisiting Hof's inverted pendulum walking model from a state space perspective

Joseph Cusumano¹, William Corvino¹, Navendu Patil¹, Jonathan Dingwell¹

¹ Pennsylvania State University

PS2 - 137 - 5-times sit to stand performance in unilateral transtibial prosthesis users should be scaled to body size

Alyssa McIntosh¹, Andrew Sawers¹, Brian Hafner²

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Sally Kenworthy¹, Stacey Gorniak²

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Herman Van Werkhoven¹, Sean Doherty¹, Alan Needle¹, Bob Kowalsky¹

¹ Appalachian State University

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Alexander Gioia¹, Robin Queen¹, Daniel Schmitt²

¹ Virginia Polytechnic Institute and State University, ² Duke University

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Christina Kyriacou¹, Robin Queen², Cherice Hill¹

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Chelsea Maynard¹, Sakura Herron¹, Dennis Nimoh¹, Christina Kyriacou¹, Cherice Hill¹

¹ University of Rochester

PS2 - 143 - Metabolic efficiency for different gear ratios on a novel manual wheelchair

Madeline Czeck¹, Henry Wyneken¹, Laura Hogan¹, Andrew Hansen¹, John Looft¹

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PS2 - 144 - Asymmetry in spatiotemporal characteristics in runners with knee pain is associated with perceived global function

Marisa Pontillo¹, Madeline Grosklos¹, Adam Bunn²

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PS2 - 145 - Analyses of ground reaction force waveforms reveal prolonged periods of altered intact loading among persons with unilateral transfemoral limb loss

Steven Voinier¹, Julian Acasio¹, Brad Hendershot², Claire Kettula³

¹ Walter Reed National Military Medical Center, ² EACE-WRNMMC, ³ University of Maryland

PS2 - 146 - Influence of speed on continuous inter-limb coordination and stability in veterans and service members with transtibial limb loss

Alexis Sidiropoulos¹, Jason Maikos², David Herlihy³

¹ Department of Veterans Affairs, ² Veterans Affairs New York Harbor Healthcare System, ³ Narrows Institute of Biomedical Research

PS2 - 147 - Dynamic plantar pressure characteristics of CMT patients compared to healthy controls

Tyce Marquez¹, Lauren Crowe¹, Bopha Chrea¹, Jason Wilken¹, Don Anderson¹

¹ University of Iowa

PS2 - 148 - Relationship between altering gait speed and cognitive abilities in children with autism

Alyssa Vanderlinden¹, Meagan Kendall², Rhonda Manning², Jeffrey Eggleston²

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PS2 - 149 - Stiffness and deflection of custom-fit, 3D-printed ankle-foot orthoses during walking and the influence of anthropometric variability

Jacquelyn Brokamp¹, Ryan Pollard¹, Ivan Ulloa-Nail¹, Michael Zabala¹

¹ Auburn University

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Martins Amaechi¹, John Collins¹, Christine Amacker¹, Heather Waters¹, Riley Horn¹, Rachel Thompson¹, Patrick Curran¹

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Jason Tsai¹, Keng-Hung Shen¹, Hao-Yuan Hsiao¹

¹ University of Texas at Austin

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Nicholas Yaple¹, Anne Martin¹

¹ Pennsylvania State University

PS2 - 153 - Dynamic motor control during walking can be acutely modulated through manipulations in environment and speed in children with cerebral palsy

Stephanie Mace¹, Joseph Harrington¹, Vivek Dutt², Brian Knarr¹, David Kingston¹

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Nathan Brantly¹, Dulce Mariscal Olivares¹, Jiwon Choi¹, Andrea Weinstein¹, Helmet Karim¹, Gelsy Torres-Oviedo¹

¹ University of Pittsburgh

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Hudson Burke¹, Shawn Russell¹, Xiao Hu¹

¹ University of Virginia

PS2 - 156 - A mathematical model of hopping with stopping controlled by muscle damping instantaneous change: biological implications and limitations

Alessandro Selvitella¹, Kathleen Foster²

¹ Purdue University Fort Wayne, ² Ball State University

PS2 - 157 - Individual muscle contributions to ankle quasi-stiffness during healthy walking

Stephanie Molitor¹, Richard Neptune¹

¹ University of Texas at Austin

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Ryan Wedge¹, Russell Johnson²

¹ East Carolina University, ² Northwestern University

PS2 - 159 - Comprehensive analysis of neuromechanical control models of human walking in physics-based simulations

Vincent Ton¹, Seungmoon Song¹

¹ Northeastern University

PS2 - 160 - Tibiofemoral contact loads across walking, kneeling, and jumping tasks with and without cognitive challenges

Scott Monfort¹, Devon Doud¹, Corey Pew¹, David Saxby², David Graham³

¹ Montana State University, ² Griffith University, ³ Children's Health Queensland

PS2 - 161 - Comparing torsional gait kinematics between marker-based and markerless motion capture

Benjamin Wheatley¹, Allyson Clarke², Kailey Granger¹, Mark Seeley³

¹ Bucknell University, ² University of Washington, ³ Geisinger Medical Center

PS2 - 162 - Impact of age of injury onset on peak normalized rotator cuff muscle forces and glenohumeral joint contact forces during manual wheelchair propulsion

Hanhsen Zhao¹, Yeajin Cho¹, Caleb Cordes², Alyssa Schnorenberg², Brooke Slavens², Carrie Peterson¹

¹ Virginia Commonwealth University, ² University of Wisconsin – Milwaukee

PS2 - 163 - Ankle biomechanics is compromised in patient with forefoot amputation: a case study

Anthony Melgar¹, Karishma Sebastain², Dumitru Caruntu³, Javier La Fontaine³, Luis Venegas³, Hafizur Rahman³

¹ Biomedical Engineering Department, ² School of Podiatric Medicine, ³ University of Texas Rio Grande Valley

PS2 - 164 - Development of the endovascular orifice detector: a novel device for antegrade in-situ fenestration of off-the-shelf endografts

Cyrus Darvish¹, Mohammad Eslami², David Vorp¹, Timothy Chung³

¹ Department of Bioengineering, ² Charleston Area Medical Center, ³ Clinical and Translational Sciences Institute

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Shay Pinhey¹, Darcy Reisman¹, Elisa Arch¹

¹ University of Delaware

PS2 - 166 - Development and specifications of plantar cutaneous vibration stimulation therapy device

Shaye Tiell¹, Brian Davis¹

¹ Cleveland State University

PS2 - 167 - Use of OpenCap to assess kinetic values for single leg vertical jump tasks: a pilot study

Sophia Stemler¹, Fatemeh Aflatounian¹, Alexandra Lynch¹, David Graham², Scott Monfort¹

¹ Montana State University, ² Children's Health Queensland

PS2 - 168 - The acute effects of transcranial direct current stimulation on sports performance

Jesse Yun¹, Jun San Juan¹, Kelly Jantzen¹, David Suprak¹, Leanne Robbins¹, Ella Wyrick¹, Alexa Nooney¹

¹ Western Washington University

PS2 - 169 - Cadaveric validation of an extra-articular implant to prevent ACL injury

Ophelie Herve¹, Sean Thomas¹, Thomas Kremen¹, David Mcallister¹, Tyler Clites¹

¹ University of California, Los Angeles

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Raiyan Talukder¹, Veronica Stuckey¹

¹ Texas A&M University

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Lucinda Duncan¹, Josiah Owusu-Danquah¹

¹ Cleveland State University

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Axelle Wasiak¹, John Challis¹

¹ Pennsylvania State University

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Matthew Beerse¹, Alexandre Kotarski², Amy Talboy³, Seyda Ozcaliskan², Jianhua Wu²

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Mohammadreza Freidouny¹, Carson Squibb¹, Masaki Hada¹, Abbie Bailey¹, Brian Kaluf², Trevor Johnson³, Michael Philen¹, Michael Madigan¹

¹ Virginia Polytechnic Institute and State University, ² Ottobock, ³ Virginia Prosthetics

PS2 - 175 - Real-time spatial filtering methods of high density sEMG for lower limb prosthetic control signals

Joseph Redmond¹, Corey Pew¹

¹ Montana State University

PS2 - 176 - DeltaCuff: a novel device to measure venous compliance from acoustic signals

John Buttles¹, Jason Lee², Cyrus Darvish³, Pete Guedner³, Rabih Chaer⁴, David Vorp³, Timothy Chung⁵

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Olivia Greene¹, Douglas Martini¹

¹ University of Massachusetts Amherst

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Sabahat Rahman¹, Ella Holtermann¹, Brendon Young¹, Ethan Chang¹, Tina Tian¹, Stephanie Anyanwu¹, Smriti Srikanth¹, Sharanya Parvathaneni¹, Elizabeth Logsdon¹, Luo Gu¹, Vito Rebecca¹

¹ Johns Hopkins University

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Manik Bansal¹, Rika Carlsen¹

¹ Robert Morris University

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Ciera Price¹

¹ Henry M Jackson Foundation

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Silvia Campos-Vargas¹, Brandon Peoples¹, Kenneth Harrison¹, Jaimie Roper¹

¹ Auburn University

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Kiichi Ash¹, Pawel Golyski², Jason Maikos³, Brad Hendershot⁴, Steven Voinier⁵

¹ Henry M Jackson Foundation, ² DoD-VA EACE, ³ Veterans Affairs New York Harbor Healthcare System, ⁴ EACE-WRNMMC, ⁵ Amputation Center of Excellence

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Veronica Venezia¹, Alex Wiggins¹, Blair Shaffer¹, Cayce Onks², Jennifer Nyland², Terrence Murphy², Ram Narayanan², Robert Creath¹

¹ Lebanon Valley College, ² Pennsylvania State University

PS2 - 185 - Asymmetrical limb loading during sit-to-stand following ACL reconstruction

Robert Creath¹, Blair Shaffer¹, Veronica Venezia¹, Alex Wiggins¹, Cayce Onks², Terrence Murphy², Jennifer Nyland², Ram Narayanan²

¹ Lebanon Valley College, ² Pennsylvania State University

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Lily Rosenblum¹, Bobby Rawls¹, Ayden McCarthy², Evan Feigel¹, Kelly Mroz¹, Todd Stefl¹, Mita Lovalekar¹, Kristen Koltun¹, Brian Martin¹, Kai Pihlainen³, Tommi Ojanen⁴, Tim Doyle², Bradley Nindl¹

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Kate Curran¹, Paige Barta¹, James Peterson¹, Christopher Aliperti¹, Josiah Steckenrider¹, Rebecca Zifchock¹

¹ United States Military Academy

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Rebecca Daniels¹, Christopher Knight¹

¹ University of Delaware

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Allyson Clarke¹, Andrew Ries², Max Donelan³, Michael Schwartz², Katherine Steele¹

¹ University of Washington, ² Gillette Children's, ³ Simon Fraser University

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Mackenzie Pitts¹, Alyssa Spomer², Andrew Ries³, Michael Schwartz³, Kat Steele¹

¹ University of Washington, ² Gillette Children's, ³ University of Minnesota

PS2 - 191 - Kinematic and spatiotemporal parameters of infants with Down syndrome after treadmill training

Alexandre Kotarski¹, Matthew Beerse², Robert Zeid¹, Amy Talboy³, Seyda Ozcaliskan¹, Jianhua Wu¹

¹ Georgia State University, ² University of Dayton, ³ Emory University

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Kaitlyn Wojciechowski¹, Yousef Qadumi¹, Nikole Galman¹, Madison Weeks¹, Julianna Ethridge¹, Georgia Parnell¹

¹ East Carolina University

PS2 - 193 - A comparison of different surgical approaches for anterior distal femoral hemiepiphysiodesis on sagittal knee kinematics

Jessica Stockhausen¹, Kellen Krajewski², Amanda Vinson³, Lucas Moore³, Scott Miller³, James Carollo³, Mariano Garay³, Radomir Dimovski³, Jason Rhodes⁴, Sayan De⁵

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Oluwaseye Odanye¹, Joseph Harrington², David Kingston², Brian Knarr²

¹ University of Nebraska Omaha, ² University of Nebraska at Omaha

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Alex Dzewaltowski¹, Ryan Crews¹, Charles Layne², Christopher Connaboy¹

¹ Rosalind Franklin University of Medicine, ² University of Houston

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Hyunji Kim¹, Chae Lynne Kim¹, Yoojin Choi¹, Joeeun Ahn¹

¹ Seoul National University

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Garrett Weidig¹, Alysha Demay², Tamara Reid Bush¹, Olivia Risko²

¹ Michigan State University, ² The Recovery Project

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Narges Shakerian¹, Jorge Zuniga², Aaron Likens¹

¹ University of Nebraska at Omaha, ² University of Nebraska Omaha

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Matthew Beerse¹, Robert Zeid², Amy Talboy³, Seyda Ozcaliskan², Jianhua Wu²

¹ University of Dayton, ² Georgia State University, ³ Emory University

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Robert Zeid¹, Jianhua Wu¹, Jackelyne Perez¹, Seyda Ozcaliskan¹, Amy Talboy²

¹ Georgia State University, ² Emory University

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Stephanie Hernández Hernández¹, Peter Adamczyk¹

¹ University of Wisconsin – Madison

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Huaqing Liang¹, Cameron Ferguson¹, Sydney McComas¹, Bre Gahm¹, Melanie Lambert², Steven Leigh¹

¹ Marshall University, ² University of Colorado Colorado Springs

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Suzanne Konz¹

¹ Marshall University

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Nikolaj Freschlin¹, Samuel Zeff¹, Kevin Valenzuela¹, Scott Ducharme¹

¹ California State University, Long Beach

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Zhichen (Jason) Feng¹

¹ University of Wyoming

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Marilena Kalaitzi Manifrenti¹, Nick Stergiou¹, Aaron Likens¹

¹ University of Nebraska at Omaha

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Taylor Wilson¹

¹ University of Oregon

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Alli Grunkemeyer¹, Aaron Likens¹

¹ University of Nebraska at Omaha

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Maxine He¹, Hamzah Jamal¹, Jiaqi Zhao¹, Simon Yu¹, Elizabeth Hsiao-Wecksler¹, Manuel Hernandez¹

¹ University of Illinois at Urbana-Champaign

PS2 - 210 - Effects of fatigability on movement variability using wearable technology

Carla Pérez-Chirinos Buxadé¹, Vinyet Solé¹, Víctor Toro-Román¹, Víctor Illera¹, Sara González-Millán¹, Lluís Albasa¹, Gerard Moras¹, Sara Ledesma¹, Oriol Teruel¹, Felipe De Jesús Alviso¹, Ogundoyin Ogundiran², Bruno Fernández-Valdés¹

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Alexandra Lynch¹, Fatemeh Aflatounian¹, Keith Hutchison¹, Scott Monfort¹

¹ Montana State University

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Katherine Elder¹, Melissa Gross²

¹ University Of Michigan, ² University of Michigan

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Suzanne Konz¹

¹ Marshall University

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Julia Nicolescu¹, Anthony Le², Andrew Peterson², Amy Lenz², Karen Troy¹

¹ Worcester Polytechnic Institute, ² University of Utah

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John Holtgrewe¹, Crystal Murray¹, Dominique Barnes¹, Janine Molino¹, Braden Fleming¹, Jillian Beveridge²

¹ Brown University, ² Brown University Health

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Sadegh Khodabandeloo¹

¹ University of Vermont

PS2 - 217 - Single-leg crossover drop accurately predicts likelihood of secondary ACL injury

Nathan Schilaty¹, Jacob Connolly¹, Lauren Luginsland¹, Aaron Krych², Nathaniel Bates³

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Jonathan Slowik¹, Kyle Planchard¹, James Andrews¹, Glenn Fleisig¹

¹ American Sports Medicine Institute

PS2 - 219 - How do Achilles tendon cross-sectional areas differ between males and females when accounting for muscle volume and subject anthropometry?

Remy Brettell¹, Emily McCain¹, Silvia Blemker¹

¹ University of Virginia

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Jessica Geiger¹, Blake Jones¹, Kristen Nicholson¹

¹ Wake Forest University School of Medicine

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Tejus Surendran¹, Axel Moore¹

¹ Carnegie Mellon University

PS2 - 222 - Three-dimensional printed femoral cancellous bone models for biomechanical testing

Omar Manzur¹, Kishore Nagaraja², Richard Samade¹, Wei Li², Robert Weinschenk¹

¹ University of Texas Southwestern Medical Center, ² University of Texas at Dallas

PS2 - 223 - Ultrasonic tracking of ulnar nerve morphology: methods

Mark Carl Miller¹

¹ University of Pittsburgh

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Isaac Kumi¹, Sennay Ghenbot², Courtney Butowicz³, Alfred Pisano², Sebastian Bawab¹, Stacie Ringleb¹

¹ Old Dominion University, ² Walter Reed National Military Medical Center, ³ DoD-VA EACE

PS2 - 225 - Bone mineral density of vertebral body is significantly lower than that of posterior elements in lumbar vertebrae of chronic low back pain patients

C. James Kim¹, Clarissa M. Levasseur², Michael Spitnale², Richard Wawrose³, William Donaldson³, Joon Lee³, Gwendolyn Sowa³, Gina Mckernan², William Anderst²

¹ University of Pittsburgh School of Medicine, ² University of Pittsburgh, ³ University of Pittsburgh Medical Center

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Clarissa M. Levasseur¹, Tom Gale¹, Sabreen Megherhi¹, Gina Mckernan¹, Richard Wawrose¹, Michael Spitnale¹, William Donaldson¹, Joon Lee¹, William Anderst¹

¹ University of Pittsburgh

PS2 - 227 - Contributions of carpal motion to thumb motion are complex and task dependent

Joseph Crisco¹, Amy Morton¹, Douglas Moore¹

¹ Brown University

PS2 - 228 - Bilateral frontal-plane knee joint moments during different types of walking in adults with unilateral knee osteoarthritis

Samantha Price¹, Joshua Stefanik², Cara Lewis³, Irene Davis⁴, Patrick Corrigan⁵

¹ Saint Louis University, ² Northeastern University, ³ Boston University, ⁴ University of South Florida, Tampa, FL, ⁵ Cleveland Clinic

PS2 - 229 - Biomechanical comparison of three plate and screw systems for the treatment of distal fibular comminuted fractures

Matheus Vilela¹, Arthur Santos², Andre Pizzolatti³, Renato Miyadahira¹, Felipe Gonzalez¹, Carlos Roesler²

¹ Rush University Medical Center, ² Universidade Federal De Santa Catarina

PS2 - 230 - Single-bundle MCL reconstruction with anatomic single-bundle ACL reconstruction does not restore knee kinematics

Junjun Zhu¹, Weimin Zhu², Patrick Smolinski³

¹ Shanghai University, ² Shenzhen²nd People's Hospital (The First Affiliated Hospital of Shenzhen University), ³ University of Pittsburgh

PS2 - 231 - Mechanical competence of bone from persons with spinal cord injury: development of a non-invasive framework to quantify torsional and compressive stiffness and strength

William Kuo¹, Anmol Doss¹, Albin Mullan¹, Christopher Cirnigliaro², William Bauman³, Saikat Pal¹

¹ New Jersey Institute of Technology, ² James J. Peters Veterans Affairs Medical Center, ³ Icahn School of Medicine at Mount Sinai

PS2 - 232 - Effect of pain relief on tibiofemoral contact forces during different types of walking in adults with knee osteoarthritis

Patrick Corrigan¹, David Felson², Tuhina Neogi², Cara Lewis², Irene Davis³, Samantha Price⁴, Sharf Daradkeh⁴, Jamil Neme⁴, John Willson⁵, Joshua Stefanik⁶

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PS2 - 233 - Deciphering the "art" in modeling and simulation of the knee joint: Benchmarking

Maryam Nazem¹, Thor Andreassen², Nancy Kim³, Kate Moyle³, Jason Halloran⁴, Casey Myers¹, Snehal Chokhandre⁵, Thor Besier³, Carl Imhauser⁶, Kevin Shelburne¹, Ahmet Erdemir⁵, Peter Laz¹

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PS2 - 234 - Relationship between KOOS JR and physical performance measures: assessing changes in function following total knee arthroplasty

Youngjae Lee¹, Garret Burks¹, Devon Pekas¹, Peter Apel¹, Benjamin Coobs¹

¹ Carilion Clinic

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Maxwell Sakyi¹

¹ University of Iowa

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Holly Stanze¹, Michael Samaan¹, Kate Jochimsen², Bethany Wilcox³, Anthony Mangino¹

¹ University of Kentucky, ² Massachusetts General Hospital & Harvard Medical School, ³ Massachusetts General Hospital

PS2 - 237 - Evaluation of clavicle morphology using statistical shape modeling

Lydia Nicholson¹, Erin Lee², Michael Rainbow², Benjamin Zmistowski³, Rebekah Lawrence³

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PS2 - 238 - Bone-anchored transfemoral prosthetic users should carry side loads on the intact side to reduce knee adduction moment

John Pope¹, Jae Shim², Jenna Burnett³, Ross Miller²

¹ University of Maryland, College Park, ² University of Maryland, ³ University of Utah

PS2 - 239 - Validation of a sensor for monitoring load in lower limb prosthesis

Theophilus Annan¹, Amit Chaudhari¹, Sagar Doshi¹, Erik Thostenson¹, Jill Higginson¹

¹ University of Delaware

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Chioma Ezeajughi¹

¹ University of Maryland, College Park

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Sydney Savage¹, Allyson Richardson¹, Olivia Cunningham¹, Andrew Polson¹, Reed Gurchiek¹

¹ Clemson University

PS2 - 242 - An early increase in early rate of force development predicts a positive response to exercise for rotator cuff tendinopathy.

Daniel Mcpherson¹, Oscar Vila Dieguez¹, Matthew Heindel¹, Lori Michener¹

¹ University of Southern California

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Jonathan Slowik¹, Claudia Leonardi², Linus Igbokwe¹, Glenn Fleisig¹

¹ American Sports Medicine Institute, ² Louisiana State University Health Sciences Center

PS2 - 244 - Wheelchair propulsion muscle activation stratified by age of spinal cord injury onset

Carrie Peterson¹, Brooke Slavens², Alyssa Schnorenberg², Anna Hazzard¹, Whitney Harmon¹, Anna Hazzard¹

¹ Virginia Commonwealth University, ² University of Wisconsin – Milwaukee

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Ipsita Sahin¹, Melanie Barahona¹, Elena Kokkoni¹

¹ University of California, Riverside

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Mukul Talaty¹

¹ Pennsylvania State University Abington

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Trung Le¹, Ha Vo¹, Scott Brandon², Craig McMahan¹

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Daniela Scagnetti¹, Amber Drvodelic¹, Sydney Robinson¹, Jeffrey Fuhrmann¹

¹ Student

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Yu Gu¹, Wanyan Su¹, Nawfal Malik¹, Thanh Nguyen¹, Anne Jordan¹, Yu Song¹

¹ University of Kansas

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Allyson Richardson¹, Sydney Savage¹, Andrew Polson¹, Olivia Cunningham¹, Amanda Taylor¹, Reed Gurchiek¹

¹ Clemson University

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Amin Mohammadi¹, Reza Pousti¹, Eric Schussler¹, Tom Campbell¹

¹ Old Dominion University

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Carly Rauch¹

¹ East Carolina University

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Haley Hartman¹, Justin Payette¹, Corrie Mancinelli¹, Edward McDonough¹, Derik Geist¹, Jean Mccrory¹

¹ West Virginia University

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Mansoureh Samadi¹, Yih-Kuen Jan¹

¹ University of Illinois at Urbana-Champaign

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Omid Jahanian¹, Kathy Pinnock Branford², Meegan Vanstraten¹, Stephen Cain², Melissa Morrow³, Hannah Houde³

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Ajit Chaudhari¹, Peter Edwards², Kiana Shannon², Savannah Renshaw², Elanna Arhos¹, Lai Wei², Benjamin Poulouse², Stephanie Di Stasi¹

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Sang Wook Lee¹, Mada Alghamdi¹

¹ Catholic University of America

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Layla Lynch¹

¹ University of Michigan

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Andrew Hill¹, Timothy Reissman¹, Megan Reissman¹, Allison Kinney¹, Skyler Barclay¹, Rebekah Revadelo¹, Trent Brown¹

¹ University of Dayton

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Harsh Buddhadev¹, Kierra Anstee¹, Emme Loman¹

¹ Sam Houston State University

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Shady Elmasry¹, Zdravco Salipur², Bruce Miller¹, Leigh Allin¹, Sarah Sharpe¹

¹ Exponent, Inc., ² Brillouin Consulting

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Bianca Henline¹

¹ Clemson University

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Brandon Doehne¹, Takato Ogasawara¹, Adam Rosen¹, Sam Wilkins¹, Brian Knarr¹

¹ University of Nebraska at Omaha

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Jeff Barfield¹, Diego Ferreira¹

¹ Lander University

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Melissa Morrow¹, Jiefei Wang², Christopher Wilburn³, Wendi Weimar³, Jerad Kosek⁴, Bahman Adlou³, John Grace³, Hannah Houde¹

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Sakiko Oyama¹, Brian Stephens¹

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Jodi Motlagh¹, David Lipps²

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Arjun Parmar¹, Derek Dewig², Albert Cohen³, Garrett Bullock⁴, Anthony Gatti⁵, Matt Harkey³

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Ryan Zappa¹, Billy Lozowski¹, Anthony Fava¹, Gretchen Oliver¹

¹ Auburn University

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Aaron Harris¹, Mason Kiesel¹, Kelly Carver¹, Kalyn Rich¹, Alexander Morgan¹

¹ Baldwin Wallace University

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Chloe Carpenter¹, Alaina Smythe¹, Taylor Huschke¹, Hannah Dean¹, Eric Meyer¹

¹ Lawrence Technological University

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Thomas Young¹, Rachel Tatarski¹, Songning Zhang¹, Lauren Kalchbrenner¹, Alexis Allen¹, Taylor Mink¹

¹ University of Tennessee

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Hailey Wrona¹, Shawn Russell¹

¹ University of Virginia

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Brian Selgrade¹

¹ Westfield State University

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Rachel Hybart¹, Jessica Zendler¹, Rosemarie Figueroa Jacinto¹, Carter Terry¹

¹ Rimkus Consulting Group

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Emily McClelland¹, Peter Weyand¹

¹ Texas Christian University

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Fatemeh Aflatounian¹, Keith Hutchison¹, Scott Monfort¹

¹ Montana State University

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Fatemeh Aflatounian¹, James Becker¹, Corey Pew¹, Keith Hutchison¹, Scott Monfort¹

¹ Montana State University

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David Phillips¹, Bethany Burr¹

¹ Oregon State University - Cascades

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Cameron Jensen¹, Brian Knarr¹, Sam Wilkins¹, Adam Rosen¹

¹ University of Nebraska at Omaha

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Neha Kapoor¹, Kiara Barrett¹

¹ Bertec Corporation

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Divya Bhaskaran¹

¹ Hamline University

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Lauren Crawford¹, Kaileigh Estler², Jake Melaro², Joshua Weinhandl³

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Grace Cordova¹, Julia Dunn¹, Michelle Sabick¹

¹ University of Denver

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Christopher Otwell¹, Steven Leigh¹, Suzanne Konz¹

¹ Marshall University

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Samantha Deangelo¹, Carly Mcpherson¹, Carly Smith¹, James Harrison², Nathan Edwards¹, Enora Le Flao¹, Nick Shoaf¹, Jaclyn Caccese¹

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Spencer Miller¹, Julien Mihy², Mayumi Wagatsuma², Jocelyn Hafer², Stephen Cain¹

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Vicon is the most trusted developer of motion capture products for the life sciences community. This year we are celebrating our 40th year, all thanks to our inspiring community of innovators and researchers around the globe. From the first commercial motion capture system in the early 1980's, to our newest developments in markerless technology, we can't wait to see where the next 40 years takes us.

Find us at **Booth 18**

VIMOTIS



www.vimotis.com

Vimotis, Inc. introduces the first noninvasive wearable sensor for measuring the load on muscle-tendon units inside the body. Using the patented technology of tendon tensiometry, Vimotis systems enable high-speed, synchronous, real-time recording and display of tendon loads during dynamic movement. Used as an unobtrusive, standalone measurement or together with other instrumentation, our groundbreaking technology opens new frontiers in movement biomechanics, sports, exercise, wellness and health.

Find us in among the **Tabletop exhibits**

XSENSOR TECHNOLOGY CORPORATION

XSENSOR

Intelligent Dynamic Sensing

www.xsensor.com

Reveal accurate gait and motion data, visualize in high-quality, and get access to advanced, easy-to-use AI-powered analysis tools with Intelligent Dynamic Sensing.

Powered by leading-edge technology XSENSOR's Foot and Gait research-grade assistive tools provide access to key insights of the lower extremities, enabling you to augment Movement Research, optimize Athletic Performance, and aid Clinical Assessment.

Our Solutions: Gait and Motion Insoles; Clinical Insoles; Walkway and Stance Pads

Find us at **Booth 11**

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