



2023 Midwest
American Society of Biomechanics
Regional Meeting



Cleveland State University
September 20th—22nd Cleveland, Ohio
engineering.csuohio.edu/midwestasb2023/midwest-american-society-biomechanics-conference

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Human–Machine Systems for Physical Rehabilitation Graduate Traineeship

A National Science Foundation Research Traineeship Program

Accepting Students for Fall 2024

Rolling Admission Priority Date January 1, 2024

Is this program for me?

If you are interested in getting a graduate degree (MS or PhD) and using technology to transform the lives of people with disabilities, this program is for you. If you want to work on teams with people with disabilities and students and faculty members from different disciplines, then you will fit in well with our team. We want students seeking degrees in all engineering fields, computer science, urban studies, psychology, and exercise science to participate. This is an opportunity to explore a career path that is meaningful and significant and touches lives. Students with disabilities and students from minority groups that are underrepresented in these fields are especially encouraged to apply.

Students with Disabilities

If you are a student with a disability, we very much want you to join our team! From travel, to housing, to everyday work in the lab, to field trips, and to peer support, we will work closely with you so that you have what you need to succeed in our program.

Application Process

To apply to the Human–Machine Systems traineeship, email us at nrt@csuohio.edu, stating that you are interested in the Human–Machine Systems traineeship.

Welcome



Welcome to the 2023 Midwest American Society of Biomechanics (ASB) Regional Meeting in Cleveland, Ohio. Our team appreciates your decision to join us for a weekend of innovation, professional networking, and fun! ASB was founded to encourage the exchange of information and ideas among researchers and to facilitate the development of the field of biomechanics, which is what we intend to do during our time together this weekend.

In addition to a full program on Thursday, we are also delighted to have a parallel meeting on Friday, namely a summit that brings together students, faculty, clinicians and those who experience disabling conditions such as spinal cord injury, cerebral palsy, stroke or related disorders. For these two events (the Midwest ASB meeting and the Rehabilitation Summit), we will share the keynote address as well as lunch and networking opportunities.

A special thank you goes out to the President of the CSU chapter of the American Society of Biomechanics -- Shaye Tiell -- who is chairing this regional meeting. Shaye has worked for months on end to make this event the best it can be. My appreciation also goes out to all the other ASB members who assisted in the planning and organization of this meeting.

Thank you for attending the Midwest ASB Regional Meeting!

A handwritten signature in black ink, appearing to read "Brian L. Davis". The signature is fluid and cursive, with a horizontal line underneath the name.

Dr. Brian L. Davis, Ph.D., FISB

Interim Chair of Mechanical Engineering and Associate Dean of Washkewicz College of Engineering

Cleveland State University

Society Information

The 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 more than 1,000 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.

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 Regional 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:** This meeting offers complimentary registration to help students cover costs associated with attending the Regional Meeting. In 2021 and 2023, all presenting students have been awarded.

- 2. Student Volunteer Opportunities:** This meeting 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.

- 3. Student-specific sessions:** This meeting 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.

- 4. Workshops:** The ASB offers many workshops at the Annual Meeting every year. This year's Midwest ASB Regional Meeting will include a workshop sponsored and provided by C-Motion.

- 5. Networking opportunities:** This meeting organizes social events designed to facilitate networking among students as well as with professionals.

- 6. Student Presentation Awards:** This meeting recognizes outstanding student posters and podium presentations.

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.

Name Badges

Your name badge is your admission ticket to the preconference workshops, conference sessions, coffee breaks, lunches, and receptions. Please always wear it. 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

The ASB Registration and information desk, located on the 3rd Floor of the Wolstein Center will be open during the following dates and times:

Wednesday, September 20 18:00 – 20:00

Thursday, September 21 7:45 – 9:15

Friday, September 22 7:45 – 9:00

If you need assistance during the conference, please visit the registration desk or find Dr. Brian Davis or Shaye Tiell, conference chairs.

Poster Information

Poster Session A – Friday, September 22

Set Up: Between 8:00 – 10:15

Session Time: 10:15 – 11:15

Tear Down: Please tear down by 12:00.

Poster Session B – Friday, September 22

Set Up: Between 12:00 – 13:00

Session Time: 13:00 – 14:00

Tear Down: Please tear down by 16:00.

Meals

Breakfast, lunch and coffee breaks will be provided on Thursday, September 21 and Friday, September 22. All other meals are on your 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 grab-and-go lunch boxes. Dietary needs will be noted on the boxed lunch.

Free Time: Places of Interest

A number of activities and places of interest have been listed below for the free evenings on Thursday and Friday.

Baseball

Head over to Jacob's Field to watch our beloved Cleveland Guardians take on the Baltimore Orioles. Thursday, September 21st, 2023 @ 7:15 pm or Friday, September 22nd, 2023 @ 7:10 pm.

Comedy

Head over to Playhouse Square: KeyBank State Theatre to join Amy Poehler and Tina Fey to celebrate their thirty years of friendship with an evening of jokes, stories, and convertainment. Thursday, September 21st, 2023 @ 8:00 pm or Friday, September 22nd, 2023 @ 8:00 pm.

Music

Head over to Mandel Concert Hall to see our world-renowned Cleveland Orchestra. Amadeus (full film with a live orchestral

underscore) is a screen triumph, a sumptuous period epic, a soaring celebration of the music of Wolfgang Amadeus Mozart. Thursday, September 21st, 2023 @ 7:30 pm or Friday, September 22nd, 2023 @ 7:30 pm.

Cleveland Museum of Natural History

At the Cleveland Museum of Natural History, explore exhibits, meet wild animals, take a hike, join a class—all while creating meaningful memories. Admission: Adults pay \$10, and Students pay \$7 with school ID. Open Thursday, September 21st, 2023, and Friday, September 22nd, 2023, from 10:00 am – 5:00 pm.

Cleveland Museum of Art

The Cleveland Museum of Art offers dynamic experiences that illuminate the power and enduring relevance of art in today's global society. The museum builds, preserves, studies, and shares its outstanding collections of art from all periods and parts of the world, generating new scholarship and understanding, while serving as a social and intellectual hub for its community. Visiting the museum's collection is always FREE to the public. Open Thursday, September 21st, 2023, from 10:00 am to 5:00 pm and Friday, September 22nd, 2023, from 10:00 am to 9:00 pm.

Great Lakes Science Center

Great Lakes Science Center's mission is to make science, technology, engineering, and math come alive.

Open Thursday, September 21st, 2023, and Friday, September 22nd, 2023, from 11:00 am – 5:00 pm.

Rock & Roll Hall of Fame

Born from the collision of rhythm & blues, country, and gospel, rock & roll is a spirit that is inclusive and ever-changing. The Rock & Roll Hall of Fame celebrates the sound of youth culture and honors the artists whose music connects us all. Open Thursday, September 21st, 2023, from 10:00 am to 9:00 pm and Friday, September 22nd, 2023, from 10:00 am to 5:00 pm.

Daily Program

Wednesday, September 20

<i>Time</i>	<i>Location</i>	<i>Event</i>
6:00pm – 8:00am	Wolstein Center 5 th Floor	Registration and Welcome Reception

Thursday, September 21

<i>Time</i>	<i>Location</i>	<i>Event</i>
8:00am – 9:15am	Wolstein Center 3 rd Floor Wolstein Center 5 th Floor	Registration and Light Breakfast
8:00am – 9:00am	Wolstein Center 5 th Floor	Workshop 1: C-Motion Software Application- Inspect 3D
9:15am – 9:30am	Wolstein Center 5 th Floor	Welcome Address: Dr. Brian Davis
9:30am – 10:30am	Wolstein Center 5 th Floor	Keynote Address 1: Dr. Ton van den Bogert
10:30am – 10:45am	Wolstein Center 5 th Floor	Coffee Break
10:45am – 12:00pm	Wolstein Center 5 th Floor	Podium Session 1: Neuromechanics
12:00pm – 1:00pm	Wolstein Center 5 th Floor	Lunch
1:00pm – 1:30pm	Wolstein Center 5 th Floor	Student Opportunities in ASB & ISB
1:30pm – 2:45pm	Wolstein Center 5 th Floor	Podium Session 2
2:45pm – 3:00pm	Wolstein Center 5 th Floor	Coffee Break
3:00pm – 4:00pm	Wolstein Center 5 th Floor	Industry Sponsors

Friday, September 22

<i>Time</i>	<i>Location</i>	<i>Event</i>
8:00am – 9:00am	Wolstein Center 3 rd Floor Wolstein Center 4 th Floor Atrium	Registration and Light Breakfast
8:45am – 9:00am	Wolstein Center 4 th Floor, Room 411	Welcome Address: Dr. Eric Schearer
9:15am – 10:15am	Wolstein Center 4 th Floor, Room 411	Keynote Address 2: Dr. Michele Grimm
10:15am – 11:15am	Wolstein Center 4 th Floor, Room 410	Coffee Break Poster Session A
11:15am – 12:00pm	Wolstein Center 4 th Floor, Room 411	Podium Session 3: Gait Biomechanics
12:00pm – 1:00pm	Wolstein Center 4 th Floor Atrium	Lunch
1:00pm – 2:00pm	Wolstein Center 4 th Floor, Room 410	Poster Session B
2:00pm – 3:00pm	Wolstein Center 4 th Floor, Room 411	Podium Session 4: Clinical Biomechanics
3:00pm – 3:45pm	Wolstein Center 4 th Floor, Room 411	Podium Session 5: Data Sharing Opportunities
3:45pm – 4:00pm	Wolstein Center 4 th Floor, Room 411	Closing Address

Keynote Speakers

Presenting Thursday, September 21st, 9:30 – 10:30

Antonie J. (Ton) van den Bogert, Ph.D.

Cleveland State University



Antonie J. (Ton) van den Bogert currently holds the Parker-Hannifin Endowed Chair in Human Motion and Control in the Department of Mechanical Engineering at Cleveland State University. He has previously been on the faculty at the University of Calgary (1993-1998) and the Cleveland Clinic (1998-2010).

His academic degrees are from the University of Utrecht (Netherlands), including a BS/MS degree in Physics and Applied Mathematics, and a PhD degree in Veterinary Science for work on locomotion in horses.

For most of his career, Ton has worked on computational modeling of human movement and computer-aided movement analysis, with applications in rehabilitation, sports, and animation. His work has been supported by numerous federal grants and by contracts with industry. Ton has served as President of the International Society of Biomechanics and also well known as the moderator of Biomch-L, an online discussion forum on human and animal movement science. He has published over 130 journal articles and book chapters, and sits on the editorial boards of three scientific journals. Notable awards are the Sports Injury Research Award of the American Orthopaedic Society for Sports Medicine (2004), and a Technical Achievement Award from the Academy of Motion Picture Arts and Sciences in 2005.

Current research interests are (1) control of powered prosthetic and orthotic devices, and (2) predicting the effect of sports equipment and rehabilitative devices on human movement and performance.

Presenting Friday, September 22nd, 9:15 – 10:15

Michele J. Grimm, Ph.D.

University of Albany



Michele Grimm joined the University at Albany in August 2022 as Dean of the College of Nanotechnology, Science, and Engineering. Prior to joining UAlbany, she was the Wielenga Creative Engineering Endowed Professor of Mechanical Engineering and Biomedical Engineering at Michigan State University. She previously spent 25 years at Wayne State University in Detroit, MI, where she established the undergraduate and graduate programs in biomedical engineering as well as the Department of Biomedical Engineering. From 2016 through 2019, Michele served as Program Director for three programs within the Engineering Directorate: Disability and Rehabilitation Engineering (DARE), Engineering of Biomedical Systems (EBMS) and Biomechanics and Mechanobiology (BMMB). She is an elected Fellow in the

American Institute of Medical and Biological Engineering (AIMBE), American Society of Mechanical Engineers (ASME) and Biomedical Engineering Society (BMES).

Building Community Partnerships for Convergent Education and Research

As engineers, we are taught to include “user needs” in our designs – but we are rarely expected to actually talk to user groups in order to do this. As scientists, we may develop a research question in consultation with experts from another domain of knowledge – but most often we still work within our academic silos when trying to identify new directions or opportunities. And as STEM educators, we claim that our classes and programs are preparing students for their professional paths – but we rarely interface with the outside world to determine if we are on the right track or if we have been successful. Even if we identify as being involved in multidisciplinary research, design, or education – a typical claim as a biomedical engineer – we often miss an opportunity to connect with all of the groups that can fully inform and optimize our solutions. We often fall short of a convergent approach to our work.

The idea of convergence – bringing multiple disciplines together to address complex and societally relevant problems – has gained traction over the past few years. The idea is that the sum is greater than the parts – and that it will take multiple perspectives, experiences, and knowledge domains working together in an intentional and integrated manner to advance science and engineering so that these challenges can be addressed. The NSF has indicated that convergent research is driven by a specific and compelling problem – but the characteristics of convergence can also help to identify or refine the problem statement.

This presentation will explore how identifying and building partnerships – especially those that connect us to the community outside of our ivory towers – can support better definitions of the problem as well as provide feedback throughout the research, design, and education processes to improve the success and impact of our work. It will propose a new view of convergence – expanding beyond academic and scientific disciplines to fully connect with the community that will be impacted by our work.

Workshops

Workshop 1: **Inspect3d**

Thursday, September 21, 2023, 8:00 am – 9:00 am

Workshop Overview



The advent of markerless motion capture has enabled researchers to collect much larger datasets than was possible using marker-based technologies. Markerless technologies have also opened the door for in-game tracking, multi-center trials, and reprocessing historical data, all of which have the potential to overwhelm current tools of biomechanical analysis.

Inspect3D is designed for biomechanical researchers with large data sets. It is designed to help researchers discover knowledge in their data sets, by giving them tools to load large data sets, remove spurious traces, and shape their data for analysis. In this demo you will see how you can go from opening files in Inspect3D to exporting results in under an hour.



Podium Sessions

Neuromechanics

Chairs: Cameron LaMack & Visar Berki

SCALING OF STAGE-2 ANTICIPATORY SYNERGY ADJUSTMENT DURING FINGER FORCE PRODUCTION IN A GO-NO-GO TASK

Ruchika Iqbal

Purdue University, West Lafayette, IN, USA

Evidence of Dynamic Dominance in Bimanual Object Manipulation: Task Performance

Abigail Sullivan

Purdue University, West Lafayette, IN, USA

EVIDENCE OF DYNAMIC DOMINANCE IN BIMANUAL OBJECT MANIPULATION: GRIP FORCE CONTROL

Rohan Prakash

Purdue University, West Lafayette, IN, USA

Loss of Cortical Inhibition in Chronic Spinal Cord Injury: Clinical Implications for Sensorimotor Impairment, Functional Capability, and Self-care Independence

Jia Liu

Cleveland Clinic Foundation, Cleveland, OH, USA

General Biomechanics

Chairs: Kelle DeBoth Foust & Skye Carlson

VARIATION OF LUMBAR ROTATION DURING ASYMMETRIC PATIENT HANDLING TASKS

Elsa Brillinger

Hope College, Holland, MI, USA

DETERMINING JOINT ANGLE THRESHOLDS FOR THE TRUNK, HIP AND, KNEES DURING MANUAL PATIENT HANDLING TASKS

Elsa Brillinger

Hope College, Holland, MI, USA

HAND TO MOUTH POSITION VS. FEEDING TASK POSITIONS IN TYPICALLY DEVELOPING CHILDREN

Madison Lovette

Akron Children's Hospital, Akron, OH, USA

THE ELASTIC MODULUS OF MULTIFLORA ROSE STEMS

Loay Al-Zube

University of Mount Union, Alliance, OH, USA

AN OBJECTIVE METHOD FOR ANALYZING IPSILATERAL MOTOR EVOKED POTENTIALS IN CHRONIC STROKE SURVIVORS WITH UPPER LIMB PARESIS

Akhil Mohan

Cleveland Clinic Foundation, Cleveland, OH, USA

Gait Biomechanics

Chairs: Madison Lovette & Jessi Martin-Liddy

EFFECTS OF ADDED MASS ON FRONTAL PLANE GAIT BIOMECHANICS IN YOUNG AND MIDDLE-AGED ADULTS

Noelle Boltz, Timothy Lehnerm and Susan Issenmann

University of Dayton, Dayton, OH, USA

Prospective Biomechanical Factors Associated with Injury for Adolescent Runners

Eryn Close

University of Toledo, Toledo, OH, USA

Identification of Reflex Control Parameters in Human Walking

Dana Lorenz

Cleveland State University, Cleveland, OH, USA

Clinical Biomechanics

Chairs: Dana Lorenz & Skye Carlson

High Activity Adversely Influences Cartilage Properties Following Multiple Patellar Dislocations

Patrick Tate

Cleveland Clinic Akron General, Akron, OH, USA

OPEN KNEE(S): A FREE AND OPEN SOURCE LIBRARY OF VIRTUAL BIOMECHANICAL REPRESENTATIONS OF THE HUMAN KNEE JOINT

Snehal Chokhandre

Cleveland Clinic, Cleveland, OH, USA

3D Printed Titanium Auxetic Structures for Cervical Disk Replacement

Timothy Norman

Cedarville University, Cedarville, OH, USA

Virtual Reality Motion Capture Creation and Validation

Trent Brown

University of Dayton, Dayton, OH, USA

Role of Directional Tasks on Upper Extremity Kinematics Using Virtual Reality

Skyler Barclay

University of Dayton, Dayton, OH, USA

Data Sharing

Chairs: Shaye Tiell & Jessi Martin-Liddy

DATA SHARING IN BIOMECHANICS: PAST AND FUTURE OPPORTUNITIES

Brian Davis

Cleveland State University, Cleveland, OH, USA

THE IMPORTANCE OF DATA SHARING IN BIOMECHANICS: AN OPEN DATA SET FOR TREADMILL PERTURBATION TRAINING IN CHIARI MALFORMATION

Brittany Sommers

Cleveland State University, Cleveland, OH, USA

Poster Listings

P1-6 *CLASSIFYING PATIENT-HANDLING TECHNIQUES TO REDUCE RISK OF MUSCULOSKELETAL INJURY IN NOVICE CAREGIVERS*

Giovanni Battaglia

Hope College, Holland, MI, USA

P1-1 *Correlation between margin of stability and rate of perceived stability during balance exercises*

Megan Bell

University of Rochester, Rochester, NY, USA

P2-10 *The Immediate Impacts of High-Intensity Exercise on Neural Activity*

Visar Berki

Cleveland State University, Cleveland, OH, USA

P1-3 *KNEE FLEXION AS AN INDICATOR OF INSTABILITY IN BALANCE EXERCISES*

Kaitlyn Boellner

Cleveland State University, Cleveland, OH, USA

P2-3 *INERTIAL MEASUREMENT UNIT-BASED HAPTIC SYSTEM TO PROVIDE FEEDBACK ON POSTURE DURING PATIENT-HANDLING TASKS*

Nathan Ceja

Hope College, Holland, MI, USA

P1-11 *Incidence of Musculoskeletal Injuries in a Forging Plant*

Grace Curtician

Cleveland State University, Cleveland, OH, USA

P1-9 *EFFECT OF ACL RECONSTRUCTION AND COGNITIVE MOTOR INTERFERENCE ON KNEE FLEXION DURING A DROP JUMP PROTOCOL*

Cassidy Haines

Baldwin Wallace University, Berea, OH, USA

P1-8 *EFFECT OF ACL RECONSTRUCTION AND COGNITIVE MOTOR INTERFERENCE ON KNEE ABDUCTION DURING A DROP JUMP PROTOCOL*

Aaron Harris

Baldwin Wallace University, Berea, OH, USA

P2-9 *Comparison of Prosthetic Knee Joint Types in Relation to Slip Risk*

Elizabeth Ibata-Arens

University of Pittsburgh, Pittsburgh, PA, USA

P2-8 *HOW TO MAKE YOUR ROBOT ACT LIKE A HUMAN ARM: REALISTIC HUMAN STIFFNESS ON MORPHOLOGICALLY DISSIMILAR ROBOTS*

Cameron LaMack

Cleveland State University, Cleveland, OH, USA

P1-7 *The Socio-Cultural and Biomechanical Impacts of Throwing Velocity for Professional Baseball Pitchers*

Steven Leicht

College of Wooster, Wooster, OH, USA

P2-2 *Low Cost Vibrating Insole for Parkinson's Disease*

Gabriela Matías

Cleveland State University, Cleveland, OH, USA

P2-6 Developing a preliminary Fall Classification Algorithm for detecting and classifying incipient falls for a hybrid exoskeleton

John Niezgoda

Cleveland State University, Cleveland, OH, USA

P1-10 EFFECT OF ACL RECONSTRUCTION AND COGNITIVE MOTOR INTERFERENCE ON HIP ADDUCTION DURING A DROP JUMP PROTOCOL

Jacob Petrus, Justin Blankenburg, Alek Johnson

Baldwin Wallace University, Berea, OH, USA

P2-4 Mechanical Characterization and In Silico Finite Element Simulation of Hydrogel-based Nerve Scaffolds

Aja Phan

Cleveland State University, Cleveland, OH, USA

P1-5 EXPLAINABILITY IN MULTIVARIATE TIME SERIES CLASSIFICATION MACHINE LEARNING MODELS

Emanuel Sanchez

Hope College, Holland, MI, USA

P1-4 FOOT DYNAMICS: CENTER OF PRESSURE VARIABILITY IN VARYING DEGREES OF PERIPHERAL NEUROPATHY

Alfonso M. Santana

Cleveland State University, Cleveland, OH, USA

P2-7 Study of the Effects of a Specialized Core Exercise for Above-Knee (AK) Amputees on Metabolic Consumption and Stability during Walking

Makayla Scarpitti

The University of Akron, Akron, OH, USA

P1-2 LOW BACK LOADING DURING PATIENT-HANDLING TASKS

Grant Seyller

Hope College, Holland, MI, USA

P2-11 Exploring IMU based systems to measure balance in older adults

Zimiego Smith

Morgan State University, Baltimore, MD, USA

P2-1 The Relationship between an Individual's Height and the Movement Strategies Implemented to Perform Manual Patient-Handling Tasks

Regina Vicente

Hope College, Holland, MI, USA

P2-12 Load Sharing in a Bilateral Biceps Curl Exercise

Elizabeth Weyman Heller

Cleveland State University, Cleveland, OH, USA

P2-5 Development of a Biofeedback Rollator Walker that Guides Users Based on Clinical Recommendations for Extended Use in the Real World

Zhongyan Zhang

University of Dayton, Dayton, OH, USA

Exhibitors & Sponsors



BERTEC

www.bertec.com

Bertec's products have represented a legacy of excellence in biomechanics for over thirty years. We provide solutions founded in accuracy and precision. Our engineering is trusted worldwide to enable a deeper understanding of human movement.

C-MOTION



c-motion.com

C-Motion, Inc. is the global leader in software tools for research biomechanics. Our goal is to enhance the value of 3D motion capture systems to improve patient outcomes, improve sports performance, reduce injuries, and generally improve lives. We do this by providing the mathematical tools that researchers and other professionals need to improve their decision making.

Located outside of Washington DC, C-Motion was created in 1997 to transfer the Move3D physical rehabilitation 6DoF analysis technology from the US National Institutes of Health into the commercial market. Visual3D is the product that resulted from this effort, and it was released commercially in 2001. C-Motion has since focused on the needs of the medical research, sports research, and rehabilitation communities with leading-edge 3D motion analysis capabilities. Today, Visual3D has thousands of users in over 50 countries.

MEDITOUCHUSA LLC



www.meditouchusa.com

MediTouch USA provides advanced rehabilitation technologies including the BalanceTutor perturbation treadmill for research, orthopedic and neuromuscular rehabilitation. The BalanceTutor's new technology allows for customized unexpected postural perturbations. It utilizes a robotic platform for movement in a medial/lateral and forward/backward direction. The system includes an embedded force plate and IMU sensors and other customized options for gait labs and research facilities.

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THE MOTIONMONITOR (Innovative Sports Training, Inc.)



www.TheMotionMonitor.com

The MotionMonitor makes a real-time biomechanics software for data collection, visualization and analysis. The MotionMonitor provides turn-key motion capture systems with all hardware and software included. Applications include finger, hand and upper extremity movement, gait, balance, sports-specific analysis including baseball, golf, basketball and more. The MotionMonitor team is excited about our recent integration of markerless motion capture, providing a research-grade hardware and software system that is optimized for flexibility and speed.

THEIA MARKERLESS



www.theiamarkerless.ca

Our objective at Theia is to radically change the biomotion industry. We capture synchronized video from an array of cameras and then use deep-learning and artificial intelligence to accurately perform the same analyses that previously required cumbersome sensors.

VICON

VICON

www.vicon.com

Innovating for over 35 years as the world's largest supplier of clinical and research motion capture systems, Vicon pioneers biomechanics, gait, and sports sciences solutions.

XSENSOR TECHNOLOGY CORPORATION

XSENSOR

Intelligent Dynamic Sensing

www.xsensor.com

XSENSOR is the industry leader in Intelligent Dynamic Sensing, which reveals hidden data across continuous skin monitoring, human performance, product design and safety testing, and sleep improvement applications. Intelligent Dynamic Sensing enables maximum precision measurements, highest quality visualizations, and AI-powered data analysis, resulting in optimized levels of product performance, comfort, and safety.

Thank you to our Sponsors!



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VICON



XSENSOR

Intelligent Dynamic Sensing

THEIA 

The THEIA logo icon is a black silhouette of a person in a dynamic, running or jumping pose, positioned to the right of the word "THEIA".

Time	September 20, 2023 Wednesday	September 21, 2023 Thursday	September 22, 2023 Friday
7:45	Free Time	Registration	Registration
8:00		Workshop 1	Registration & Breakfast
8:15			
8:30		Breakfast	Welcome Address
8:45			
9:00		Welcome Address	Keynote Address 2: Dr. Michele Grimm (Wolstein Center 4th Floor, Room 411)
9:15			
9:30		Coffee Break	Coffee Break Poster Session A (Wolstein Center 4th Floor, Room 410)
9:45			
10:00		Podium Session 3: <i>Gait Biomechanics</i> (Wolstein Center 4th Floor, Room 411)	
10:15			Lunch
10:30		Lunch	
10:45			Student Opportunities in ASB & ISB (Wolstein Center 5th Floor)
11:00		Podium Session 2: <i>General Biomechanics</i> (Wolstein Center 5th Floor)	
11:15			Podium Session 4: <i>Clinical Biomechanics</i> (Wolstein Center 4th Floor, Room 411)
11:30		Coffee Break	
11:45			Industry Sponsors
12:00		Closing Address	
12:15			Free Time
12:30		Free Time	
12:45			Registration & Welcome Reception (Wolstein Center 5th Floor)
13:00		Registration & Welcome Reception (Wolstein Center 5th Floor)	
13:15			Registration & Welcome Reception (Wolstein Center 5th Floor)
13:30		Registration & Welcome Reception (Wolstein Center 5th Floor)	
13:45			Registration & Welcome Reception (Wolstein Center 5th Floor)
14:00		Registration & Welcome Reception (Wolstein Center 5th Floor)	
14:15			Registration & Welcome Reception (Wolstein Center 5th Floor)
14:30		Registration & Welcome Reception (Wolstein Center 5th Floor)	
14:45			Registration & Welcome Reception (Wolstein Center 5th Floor)
15:00		Registration & Welcome Reception (Wolstein Center 5th Floor)	
15:15	Registration & Welcome Reception (Wolstein Center 5th Floor)		
15:30		Registration & Welcome Reception (Wolstein Center 5th Floor)	
15:45	Registration & Welcome Reception (Wolstein Center 5th Floor)		
16:00		Registration & Welcome Reception (Wolstein Center 5th Floor)	
17:00	Registration & Welcome Reception (Wolstein Center 5th Floor)		
18:00		Registration & Welcome Reception (Wolstein Center 5th Floor)	
18:30	Registration & Welcome Reception (Wolstein Center 5th Floor)		
19:00		Registration & Welcome Reception (Wolstein Center 5th Floor)	
19:30	Registration & Welcome Reception (Wolstein Center 5th Floor)		
20:00		Registration & Welcome Reception (Wolstein Center 5th Floor)	