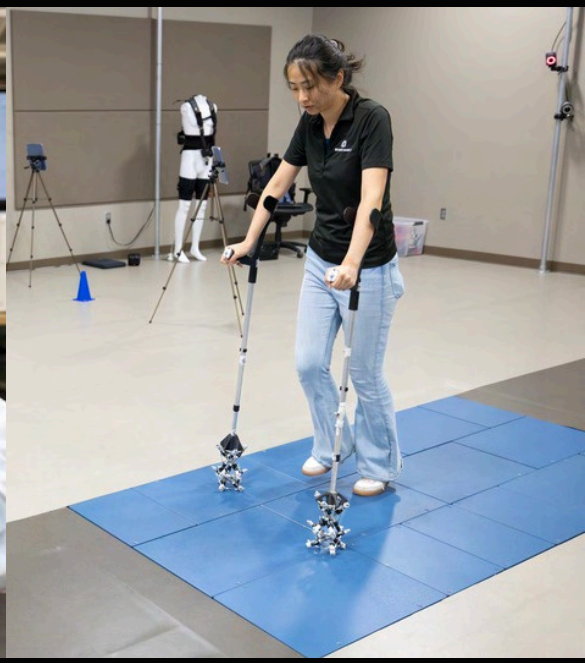
UNIVERSITY OF NEBRASKA AT OMAHA
BIOMECHANICS RESEARCH BUILDING

2026 HUMAN MOVEMENT VARIABILITY AND GREAT PLAINS BIOMECHANICS CONFERENCES

May 14th and 15th, 2026

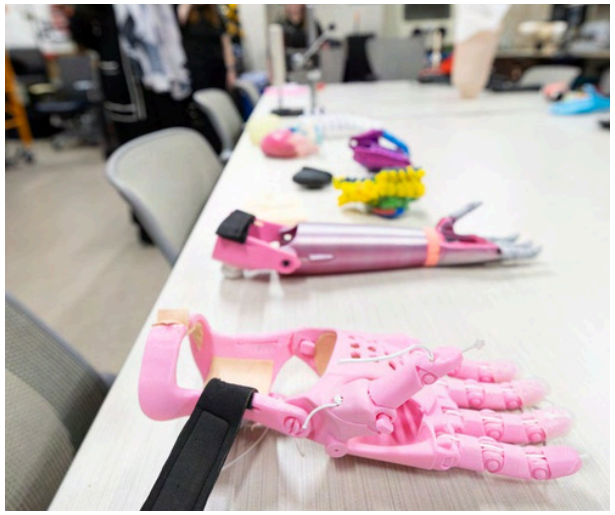
9:00 A.M. to 5:00 P.M.

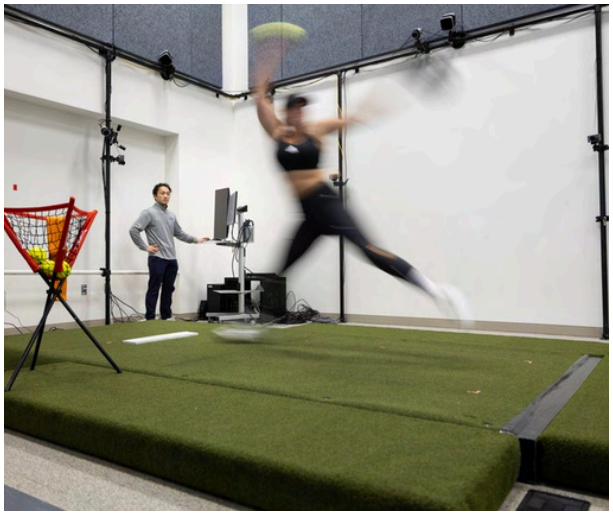
Scott Conference Center
Omaha, Nebraska



University of Nebraska Omaha

UNIVERSITY OF NEBRASKA AT OMAHA
BIOMECHANICS RESEARCH BUILDING





GREAT PLAINS BIOMECHANICS CONFERENCE

Thursday, May 14th, 2026

7:00-8:45 AM

EXHIBITOR /POSTER SET-UP
REGISTRATION

8:45-9:00 AM

WELCOME
Center Room

9:00-10:15 AM

KEYNOTE SPEAKER: DR. HERMAN VAN DER KOOIJ
UNIVERSITY OF TWENTE
Center Room

10:15-10:30 AM

COFFEE / EXHIBITORS
Foyer

10:30-12:00 PM

PODIUM SESSION A
Center Room

12:00-12:30 PM

LUNCH / EXHIBITORS
Center Room

12:30-2:00 PM

POSTER SESSION A
East Room

2:00-3:30 PM

PODIUM SESSION B
Center Room

3:30-3:45 PM

COFFEE / EXHIBITORS
Foyer

4:00-5:00 PM

TOUR OF UNO BIOMECHANICS RESEARCH BUILDING

GREAT PLAINS BIOMECHANICS KEYNOTE

Dr. Herman van der Kooij

Herman van der Kooij received his PhD cum laude from the University of Twente, where he started as an assistant professor in Department of Biomechanical Engineering in 2002, and was promoted to full professor in 2010. From 2008 he is also affiliated with Delft University of Technology, from 2011 as full professor. In 2010-2011 he spent a year as visiting professor at the The École Polytechnique Fédérale de Lausanne (EPFL) in the Biorobotics laboratory headed by Prof. Auke Ijspeert. More informaton can be found on his personal website and the website of his Biomechatronics and Rehabilitation group.

University of Nebraska Omaha

HUMAN BALANCE CONTROL: FROM FOUNDATIONAL STUDIES TO APPLICATIONS IN WEARABLE ROBOTICS

ABSTRACT

We study how humans maintain balance during walking and standing, particularly by applying well-controlled perturbations to probe the underlying mechanisms. These experiments reveal recovery strategies that can be quantified using biomechanical metrics such as whole-body angular momentum and center-of-mass dynamics. The resulting data are used to develop and validate neuromechanical models of human balance control. Insights from this research inform the design of balance-assisting exoskeletons and prosthetic devices that aim to support, and potentially even enhance, natural human balance capabilities.

GREAT PLAINS BIOMECHANICS PODIUM PRESENTATIONS

PODIUM SESSION A

NAME	PRESENTATION TITLE
TOKA AHMED	OPENCAP VS THEIA3D, A COMPARISON FOR UPPER LIMB FUNCTIONAL ASSESSMENT
ASSEFA ADISU	SITE-SPECIFIC VENOUS ASPIRATION REDUCES INTRACRANIAL PRESSURE IN A STARLING RESISTOR MODEL OF CEREBRAL HEMODYNAMICS
DIVYA BHASKARAN	SHOULDER STRENGTH, BALANCE, AND ROTATIONAL PROFILES IN OVERHEAD ATHLETES: A COMPARATIVE ANALYSIS OF GYMNASTS AND TRACK-AND-FIELD THROWERS
JINGXIAN GU	A BIOLOGICALLY INSPIRED DESIGN FOR COMPLIANT MOBILITY ASSISTIVE DEVICES INCREASES USABILITY AND WALKING PERFORMANCE
SEUNG KYEOM KIM	SYMBOLIC REGRESSION REVEALS A SPEED DEPENDENT EQUATION OF THIGH ANGULAR ACCELERATION
SAHEL MOHAMMADI	A WEARABLE SOFT ROBOTIC MIDSOLE FOR AUGMENTING ANKLE PUSH-OFF IN WALKING

PODIUM SESSION B

NAME	PRESENTATION TITLE
VASILEIOS MYLONAS	NANOFIBER STENT-GRAFTS PRESERVE AORTIC PRESSURE DYNAMICS WHILE CONVENTIONAL GRAFTS INDUCE DETERMINISTIC BEHAVIOR
CLAUDIA FERNANDA ROMERO-FLORES	THE INFLUENCE OF ARM POSITION DURING BACK EXTENSION IN ACROBATIC ATHLETES
ZAHRA SALAMIFAR	MODIFIED SUPERVISED EXERCISE TRAINING IMPROVES LEVEL OF COMFORT AND FATIGUE IN PATIENTS WITH PERIPHERAL ARTERY DISEASE
NATALIE WEATHERWAX	COMPENSATORY STEP YAW CONTROL AFTER MULTIDIRECTIONAL SUPPORT SURFACE TRANSLATIONS
ELIZABETH ZERMENO	FEASIBILITY AND BIOMECHANICS OF MECHANICALLY OPTIMIZED GRAFTS WITH NATIVE ARTERY-LIKE AXIAL PRESTRETCH
SHARAFIAN MOGHADDAM EHSAN	REAL-TIME HAPTIC FEEDBACK FOR GAIT TRAINING IN OLDER ADULTS: EFFECTS ON STRIDE LENGTH, SPEED, AND COGNITIVE LOAD

GREAT PLAINS BIOMECHANICS POSTER PRESENTATIONS

POSTER SESSION A

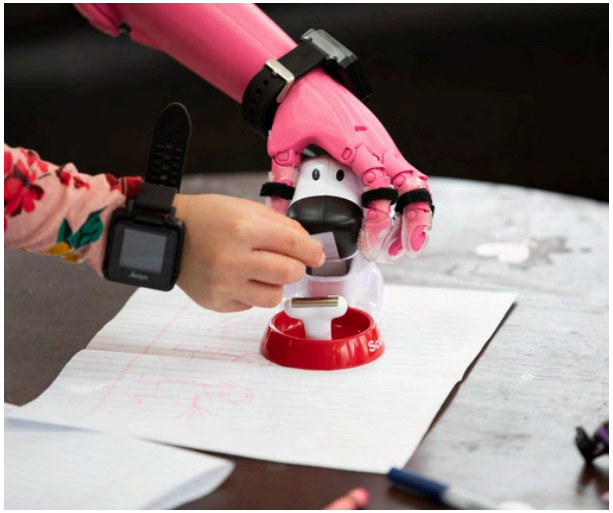
POSTER #	NAME	PRESENTATION TITLE
1	MOHAMMAD ALI GHODS	XFEM-BASED COMPARISON OF STRAIN FAILURE CRITERIA FOR FEMORAL FRACTURE ANALYSIS
2	MATTHEW BAYSA	EXPLORATION OF SDEAS AS ARTIFICIAL MUSCLES IN A BIOMIMETIC FINGER EXTENSOR EXOSKELETON
3	ELEANOR BRITSON	OPTIMIZING ADDITIVE MANUFACTURING TECHNOLOGIES AND MATERIALS FOR MID-SCALE PROSTHETIC LINERS
4	PADEN COLLARD	DIFFERENCES IN FOREARM PRONATION VELOCITY ACROSS PITCH TYPES IN SOFTBALL PITCHERS
5	LILIANA DELGADO	MECHANICAL CHARACTERIZATION OF 3D PRINTED MATERIAL FOR MEDICAL AND ASSISTIVE DEVICE APPLICATIONS
6	SANAZ FARMANI	BIOMECHANICS OF HUMAN UMBILICAL ARTERIES
7	ALEC FICHTER	STRIDE LEG VARIABLES AS PREDICTORS OF A BASEBALL PITCHER'S CHANGE IN LINEAR MOMENTUM
8	DIMITRI HAAN	VALUES OF MINIMAL DETECTABLE CHANGE VARIES BETWEEN JOINT ANGLES AND COMPETITION LEVEL IN BASEBALL PITCHING BIOMECHANICS
9	TOMOHIRO IDE	RELATIONSHIPS BETWEEN HUMERAL RETROVERSION–CORRECTED SHOULDER RANGE OF MOTION AND UPPER-EXTREMITY BIOMECHANICS IN COLLEGIATE BASEBALL PITCHERS
10	CAMERON JENSON	EXPLAINING THE BIOMECHANICAL DIFFERENCES IN MALE AND FEMALE GOLF SWINGS USING A FUNCTIONAL ASSESSMENT
11	BAHMAN KARGARBAHRKHAZAR	DEVELOPMENT OF A BENCHTOP MODEL FOR ASSESSING AORTIC SEPTOSTOMY
12	DOMINIC KOPERSKI	MECHANICAL AND ANTIMICROBIAL ANALYSIS OF ADDITIVE MANUFACTURING TECHNIQUES FOR MEDICAL DEVICES
13	ELLE LOYD	ROBOTIC EXOSKELETON IMPROVES STEP LENGTH AND TIME IN PATIENTS WITH PERIPHERAL ARTERY DISEASE
14	MOBINA MASAEI	INTEGRATING BRAIN-COMPUTER INTERFACE AND VIRTUAL REALITY WITH HAND AND ARM BIMANUAL INTENSIVE THERAPY FOR UPPER EXTREMITY REHABILITATION IN CHILDREN WITH CEREBRAL PALSY: A FEASIBILITY STUDY

GREAT PLAINS BIOMECHANICS POSTER PRESENTATIONS

POSTER SESSION A

POSTER #	NAME	PRESENTATION TITLE
15	GABRIELLE MOSER	ASSISTIVE FOOTWEAR REDUCES PLANTAR PRESSURE AND IMPROVES ANKLE KINEMATICS DURING WALKING
16	BRANDON MUCZYNSKI	BIOMECHANICAL ANALYSIS OF FOREARM PRONATION AND SUPINATION AMONG VARIOUS PITCH TYPES
17	SEONGWOO MUN	PHASE-DEPENDENT REFERENCE CONFIGURATIONS IMPROVE RIGID BODY MARKER RECONSTRUCTION DURING WALKING
18	JOE NEIHART	CARBON-FIBER REINFORCED MILITARY BOOTS TO IMPROVE PLANTAR PRESSURE IN INDIVIDUALS WITH CHRONIC ANKLE INSTABILITY
19	MAHDIS RIAZIKHAH	MODIFIED SUPERVISED EXERCISE THERAPY IMPROVES PHYSICAL ENJOYMENT IN PATIENTS WITH PERIPHERAL ARTERY DISEASE
20	MADDIE ROZMAJZL	MODIFIED SUPERVISED EXERCISE THERAPY RESULTS IN SIMILAR METABOLIC RATE AS STANDARD EXERCISE THERAPY IN PATIENTS WITH PERIPHERAL ARTERY DISEASE
21	NARGES SHAKERIAN	LOWER MATCHING TOLERANCE PRODUCES RELIABLE STRIDE INTERVAL SAMPLE ENTROPY IN HEALTHY ADULTS
22	ELLA SWANK	PRODUCING A MODULAR, LOW-COST 3D-PRINTED ASSISTIVE WHEELCHAIR USING OPEN-SOURCE DESIGN

UNIVERSITY OF NEBRASKA AT OMAHA
BIOMECHANICS RESEARCH BUILDING



HUMAN MOVEMENT VARIABILITY CONFERENCE

Friday, May 15th, 2026

8:00-8:45 AM
EXHIBITORS / POSTER SET-UP
REGISTRATION

8:45-9:00 AM
WELCOME
Center Room

9:00-10:15 AM
KEYNOTE SPEAKER: DR. DUARTE ARAUJO
UNIVERSITY OF LISBON
Center Room

10:15-10:30 AM
COFFEE / EXHIBITORS
Foyer

10:30-12:00 PM
PODIUM SESSION C
Center Room

12:00-12:30 PM
LUNCH / EXHIBITORS
Center Room

12:30-2:00 PM
POSTER SESSION B
East Room

2:00-3:30 PM
PODIUM SESSION D
Center Room

3:30-3:45 PM
COFFEE / EXHIBITORS
Foyer

3:45-4:30 PM
CAREER PANEL
Center Room

4:30-5:00 PM
AWARD CEREMONY
Center Room

HUMAN MOVEMENT VARIABILITY KEYNOTE

Dr. Duarte Araújo

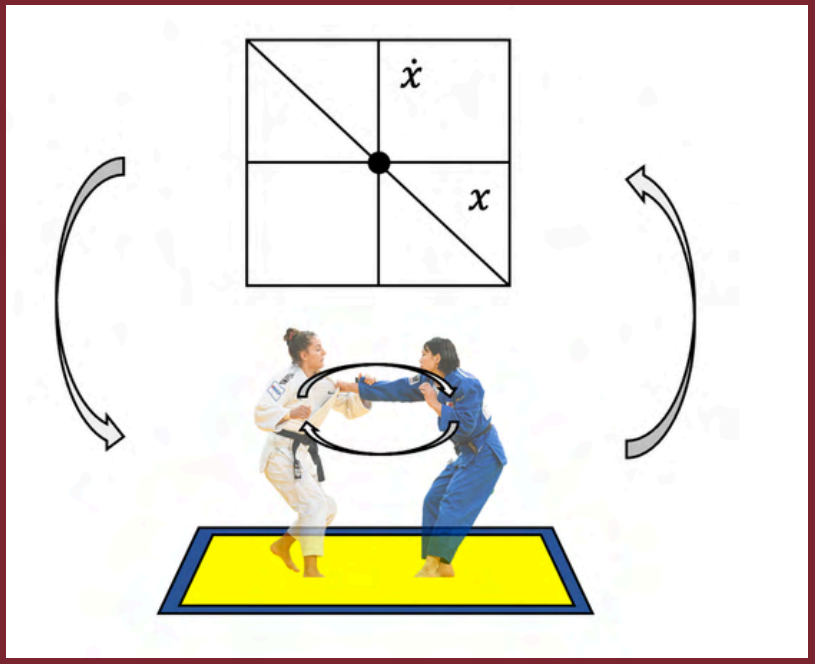
Duarte Araújo, Ph.D., is Full Professor and Head of the Laboratory of Expertise in Sport of the Faculty of Human Kinetics at the University of Lisbon, Portugal. He leads the research unit CIPER – Interdisciplinary Centre for the study of Human Performance, which includes researchers from all over the country. From 2010 to 2018 he was the President of the Portuguese Society of Sport Psychology. Araújo's research focus on sport expertise and decision-making, performance analysis, variability and skill learning from an ecological dynamics, complex systems approach. He developed the concept of cognizant action. He has published more than 200 papers in scientific journals and more than 15 books. He collaborates regularly with Sport Institutions and Clubs worldwide.

University of Nebraska Omaha

COGNIZANT ACTION IN SPORT: THEORY AND DATA

ABSTRACT

How can we perform actions better than we did before? The traditional understanding of human movement attributes to the brain the power of predicting action consequences, as well as predicting the immediate changes in the environmental circumstances where such action will occur. However, this view is quite 'sedentary' because it assumes that the brain is lagging behind, i.e. it is making inferences before the body moves, and that the body is simply input for brain inferences. I'll present an ecological dynamics approach to cognizant action, aligned with Gibson, where behavior is understood in terms of self-organized action directed towards affordances. Action is intentional and intelligent (cognizant), without locating intelligence in the brain, but in the performer-environment moving system. The research I'm presenting focuses on sport performance, where perceptual-motor solutions to the challenges placed by the task environment demand active cognizant bodies, instead of passive bodies instructed by the brain.



HUMAN MOVEMENT VARIABILITY POSTER PRESENTATIONS

POSTER SESSION B

POSTER #	NAME	PRESENTATION TITLE
1	ISABELLA ARRAYALES MEJIA	DEVELOPMENT OF A 3D-PRINTED ORTHOTIC DEVICE FOR CANINE CRANIAL CRUCIATE LIGAMENT STABILIZATION
2	MAHSA BARFI	AUGMENTING STANCE TIME VIA TACTILE FEEDBACK IMPROVES PROPULSION IN CHRONIC STROKE SURIVORS
3	COOPER BESOUGLOFF	MUSCLE-SPECIFIC EMG RESPONSES AND RELATIONSHIP TO POWER OUTPUT FOLLOWING ISOMETRIC AND ECCENTRIC-ISOMETRIC PRIMING
4	MATTHEW BOLLIG	SPATIOTEMPORAL GAIT PARAMETERS FOLLOWING SUPERVISED EXERCISE THERAPY IN INDIVIDUALS WITH PERIPHERAL ARTERY DISEASE
5	RAEGAN BUETTNER	EFFECTS OF ROBOTIC ANKLE EXOSKELETON ASSISTANCE ON MUSCLE OXYGENATION DURING WALKING IN INDIVIDUALS WITH PERIPHERAL ARTERY DISEASE
6	THEODOROS DELIGIANNIS	TOWARD SCALABLE BALANCE TESTING IN AGING VIA WOBBLE-BOARD DYNAMICS
7	CHRIS ENGSBERG	CLASSIFICATION OF GAIT-LIKE PLANTAR STIMULATION FROM FMRI BOLD ACTIVITY
8	MAHTAB FARZANEHNEJAD	VALIDATION OF A STREAMLINED BILATERAL IMU SYSTEM FOR CONTINUOUS SEVEN-PHASE GAIT DETECTION
9	ORLANDO DE JESUS SEMEDO MENDES FERNANDES	BRIDGING REHABILITATION AND TECHNOLOGY: IMPROVING GAIT CONTROL AND FUNCTIONAL MOBILITY THROUGH SENSORIMOTOR TRAINING AND PHYPHOX MONITORING
10	YASSINE IRO	GROUND REACTION FORCE ADAPTATIONS DURING WALKING AFTER STANDARD VS OXYGENATION-GUIDED EXERCISE IN PATIENTS WITH PERIPHERAL ARTERY DISEASE
11	MADISON KERR	RELATIONSHIP BETWEEN SIDE-HOP PERFORMANCE AND MEASURES OF NEUROMUSCULAR FUNCTION IN YOUNG, UNINJURED ADULTS
12	SOFIA LEE	THE CORRELATION BETWEEN REACTIVE STRENGTH INDEX AND PEAK ECCENTRIC AND CONCENTRIC FORCE IN MALE BASKETBALL PLAYERS
13	SANG YUP LEE	SPEED AND DEPTH MODULATE PHYSIOLOGICAL AND BIOMECHANICAL RESPONSES IN AQUATIC TREADMILL WALKING
14	ANDREA LOPEZ	PRE- AND POST-INTERVENTION EMG ANALYSIS FOLLOWING SUPERVISED EXERCISE IN PERIPHERAL ARTERY DISEASE

HUMAN MOVEMENT VARIABILITY POSTER PRESENTATIONS

POSTER SESSION B

POSTER #	NAME	PRESENTATION TILE
15	STEPHANIE MACE	DYNAMIC STABILITY DURING OVERGROUND WALKING IN INDIVIDUALS WITH OSTEOGENESIS IMPERFECTA
16	COLINA MATTHEWS	FOOT PROGRESSION ANGLE VARIABILITY IN CHILDREN WITH CEREBRAL PALSY
17	ROC MIRO	THE EFFECT OF MODIFIED SUPERVISED EXERCISE THERAPY ON MUSCLE OXYGENATION IN PATIENTS WITH PERIPHERAL ARTERY DISEASE
18	SEONGWOO MUN	EFFECT OF AUDITORY BIOFEEDBACK ON COM-BASED FOOT PLACEMENT CONTROL DURING WALKING: PRELIMINARY DATA FROM A SINGLE PARTICIPANT
19	KEVIN STARNES	ANALYSIS OF JOINT AND ELBOW LOAD ACROSS PITCH TYPES IN COLLEGIATE SOFTBALL PITCHERS
20	RYAN VERMEER	THE RELATIONSHIP BETWEEN TRUNK ROTATION CHARACTERISTICS AND KNOWN PERFORMANCE AND INJURY PARAMETERS IN BASEBALL PITCHERS
21	JANIA WILLIAMS	FLYBAND® EXOBOOTS PROVIDE SUPERIOR SUPPORT, COMFORT, AND PERFORMANCE DURING DYNAMIC MOVEMENTS COMPARED TO CONVENTIONAL BOOTS AND BRACING

HUMAN MOVEMENT VARIABILITY PODIUM PRESENTATIONS

PODIUM SESSION C

NAME	PRESENTATION TILE
CHRIS ENGSBERG	AUGMENTING STANCE TIME VIA TACTILE FEEDBACK IMPROVES PROPULSION IN CHRONIC STROKE SURVIVORS
STYLIANOS GRIGORIADIS	TEMPORALLY STRUCTURED VARIABILITY IN STRENGTH TRAINING ENHANCES ADAPTABILITY AGAINST FORCE PERTURBATIONS
JINGXIAN GU	DELAYED AND AMPLIFIED AUDITORY FEEDBACK AFFECTS WALKING VARIABILITY AND FREQUENCY ADAPTATION
JORDAN HERNANDEZ	TRAINING A CONVOLUTIONAL NEURAL NETWORK TO IDENTIFY ALTERED LOCOMOTION PATTERNS IN SOCIALLY ISOLATED MARMOSETS TREATED WITH ANTIBIOTICS
MARILENA KALAITZI MANIFRENTI	STRIDE INTERVAL VARIABILITY DEVIATES FROM FRACTIONAL GAUSSIAN NOISE

PODIUM SESSION D

NAME	PRESENTATION TILE
SEUNG KYEOM KIM	GAIT DYNAMICS IN SPACE AND TIME REVEAL DISTINCT IMPACTS OF AGING ACROSS THE LIFESPAN
DIANA MARTINEZ-REYES	EXPLAINABLE DEEP LEARNING REVEALS THE NONLINEAR CONTRACTION OF MOTOR REPERTOIRE IN AGE-RELATED GAIT
VASILEIOS MYLONAS	VARIABILITY-EMBEDDED MUSIC IS AS EFFECTIVE AS AUDITORY OR VISUAL CUEING IN MODULATING GAIT VARIABILITY
JACK PARADIS	EFFUSION PERSISTS AT 6 MONTHS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION WITHOUT IMPACTING GAIT BIOMECHANICS OR QUAD STRENGTH
SANGWON SHIN	ASYMMETRIC HIP EXOSUIT RESISTANCE PRODUCES BILATERAL AFTEREFFECTS IN HIP MECHANICS AND PROXIMAL MUSCLE ACTIVITY
MALVINA TZIOUREF	ARM-SWING RESTRICTION CHANGES WHOLE-BODY ANGULAR MOMENTUM ACROSS ALL PLANES OF MOTION AND INCREASES TEMPORAL PERSISTENCE IN GAIT VARIABILITY

CAREER PANEL

DUARTE ARAÚJO
UNIVERSITY OF LISBON

SHERIDAN PARKER
NEBRASKA MEDICINE

CORBIN RASMUSSEN
CREIGHTON UNIVERSITY

2026 CONFERENCE SPONSORS

ASB
American Society of Biomechanics

AMTI
FORCE AND MOTION

HAS Motion

BERTEC

XSENSOR
Intelligent Dynamic Sensing

novel

COSMED
The Metabolic Company

thera

unemed
tech transfer for nebraska

UNeTech
INSTITUTE

UNIVERSITY OF NEBRASKA AT OMAHA
BIOMECHANICS RESEARCH BUILDING

THANK YOU FOR ATTENDING THE 2026 GREAT PLAINS BIOMECHANICS AND HUMAN MOVEMENT VARIABILITY CONFERENCES!