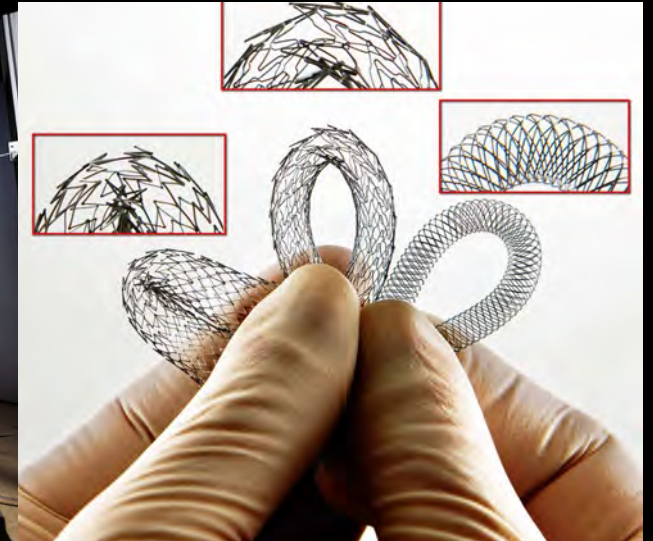
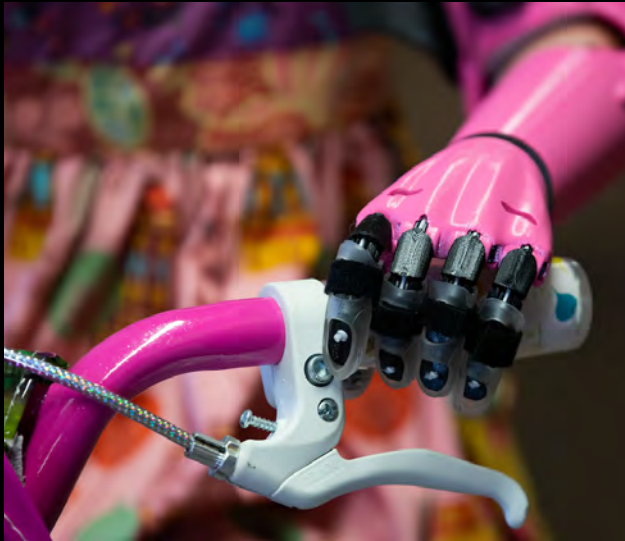


2022 HUMAN MOVEMENT VARIABILITY & GREAT PLAINS BIOMECHANICS CONFERENCES

May 16-20, 2022

*Scott Conference Center
Omaha, Nebraska*



UNIVERSITY OF
Nebraska
Omaha



Schedule at a Glance

MONDAY, MAY 16

Pre-Conference Workshops

Biomechanics Research Building

Topics: Phase Space
Reconstruction, Measuring Phase
Space Dynamics

8:30-11:30 AM: Lecture

11:30 AM-12:30 PM: Lunch on your
own

12:30-3:30 PM: Hands on session
working with code

TUESDAY, MAY 17

Pre-Conference Workshops

Biomechanics Research Building

Topics: Measures of Uncertainty,
Fractals and Multifractals

8:30-11:30 AM: Lecture

11:30 AM-12:30 PM: Lunch on your
own

12:30-3:30 PM: Hands on session
working with code

WEDNESDAY, MAY 18

Great Plains Biomechanics Conference

8:00 AM: Registration

8:45 AM: Welcome

9:00 AM: Podium Session 1

10:00 AM: Coffee/Vendor Bingo

11:00 AM: Poster Session 1

12:00 PM: Lunch/Vendor Bingo

12:45 PM: Keynote Speaker

2:00 PM: Podium Session 2

3:00 PM: Break/Vendor Bingo

3:15 PM: Awards

3:45 PM: Student Professional
Development Event

5:00 PM: Happy Hour at Inner Rail

THURSDAY, MAY 19

Human Movement Variability Conference

8:00 AM: Registration

8:45 AM: Welcome

9:00 AM: Podium Session 1

10:00 AM: Coffee/Vendor Bingo

11:00 AM: Poster Session 1

12:00 PM: Lunch/Vendor Bingo

12:45 PM: Keynote Speaker

2:00 PM: Promising Student Award
Presentations

3:00 PM: Break/Vendor Bingo

3:15 PM: Awards

FRIDAY, MAY 20

Virtual Poster Presentations

9:00-11:30 AM: Virtual
Presentations via Spatial Chat

Great Plains Biomechanics Conference



KEYNOTE SPEAKER DR. VEERLE SEGERS GHENT UNIVERSITY

ABOUT DR. SEGERS

Dr. Segers is a professor at Ghent University with research focusing on lower impact running and adaptations of running style. Focusing on an effective intervention to reduce running injuries and only benefit from the positive effects of running. She maintains the link between fundamental biomechanics and the sports community.

PRESENTATION: A BIOMECHANICAL PERSPECTIVE ON LIFE TIME RUNNING

Running is the ideal preventive medicine for ageing healthy. There is a high prevalence of running-related injuries, especially in the cohort of novice runners. Biomechanical insights can help to avoid running-related injuries and perhaps make "running on prescription" possible.

PODIUM SESSION 1

IMPROVING PARETIC GAIT MECHANICS USING VISUAL OVERGROUND BIOFEEDBACK

Erica H Hinton, Samuel Bierner, David Kingston, Nick Stergiou, Trisha Kesar, Brian A. Knarr

SLIP-AND-FALL RISK POSED BY SLOPED WALKING SURFACES

Corbin M. Rasmussen, Abderrahman Ouattas, Nathaniel H. Hunt

EFFECTS OF PASSIVE AND ACTIVE LEG MOVEMENT TO INTERRUPT PROLONGED SITTING IN MILD HYPERCAPNIA ON VASCULAR FUNCTION IN HEALTHY ADULTS

Elizabeth J. Pekas, TeSean K. Wooden, Cody P. Anderson, Michael F. Allen, Gwenael Layec, Song-Young Park

THE OPTIMAL RELATIONSHIP BETWEEN ACTUATOR STIFFNESS AND ACTUATION TIMING FOR A PASSIVE ANKLE EXOSKELETON: AN OPENSIM SIMULATION

Cody Anderson, Hafizur Rahman, Sara Myers

PODIUM SESSION 2

FPA BYPASS GRAFT WITH TUNED LONGITUDINAL COMPLIANCE

Pegah Nouri Mousa, Kaspars Maleckis

EFFECT OF STENT DESIGN ON THE FEMOROPLOPLITEAL ARTERY DEFORMATIONS AND STRESSES

Ali Ahmadi, Alexey Kamenskiy, Anastasia Desyatova

REGIONAL HETEROGENEITY IN THE BIOMECHANICS OF HUMAN AORTA

Madihah Kazim, Majid Jadidi

CARDIOVASCULAR AND AUTONOMIC RESPONSES TO ACUTE EXPOSURE TO MILD HYPERCAPNIC CONDITIONS IN MIDDLE-AGED ADULTS

Michael Allen, Liz Pekas, Cody Anderson, Song-Young Park

POSTERS

Poster #	Presentation	Title	Authors
9	Poster	PRELIMINARY VALIDATION OF PERTURBATION-BASED ESTIMATION OF METABOLIC COST WITHIN STRIDE	Alex Dzewaltowski, Seungmoon Song, Keegan Moore, Philippe Malcolm
10	Poster	JOINT BIOMECHANICS IS ALTERED WHEN WALKING WITH ANKLE-FOOT ORTHOSES IN PERIPHERAL ARTERY DISEASE	Fallahtafi, F, Pipinos, I, Johanning, J, Rahman, H, Hassan, M, Myers, SA
11	Poster	THE EFFECTS OF CANE USE ON FRONTAL PLANE HIP BIOMECHANICS IN CHRONIC STROKE GAIT	Emily Steffensen, Erica H. Hinton, Oluwaseye Odanye, Lindsey Remski, Samuel Bierner, Brian A. Knarr
12	Poster	REDUCING LOADING ON THE CONTRALATERAL LIMB USING HUMAN-IN-THE-LOOP OPTIMIZATION	Siena Senatore, Philippe Malcolm
13	Poster	STANCE LIMB PLANTAR FORCE AND ANKLE JOINT MECHANICS DURING ASSISTED WALKING IN PATIENTS WITH TYPE 2 DIABETES	Jose G. Anguiano-Hernandez, Vijay Shivaswamy, David C. Kingston
14	Poster	AGE-RELATED DIFFERENCES IN TEMPORAL CHARACTERISTICS OF HEAD CONTROL IN RESPONSE TO POSTURAL PERTURBATIONS	Lingjun Chen, Tyler Wood, Manuel Hernandez, Jacob Sosnoff
15	Poster	CAN ACTUATION TIMING AND MAGNITUDE OF A BILATERAL SEMI-RIGID HIP EXOSKELETON ALTER METABOLIC COST?	Arash Mohammadzadeh Gonabadi, Prokopios Antonellis, Sara Myers, Iraklis Pipinos, and Philippe Malcolm
16	Poster	BIOMECHANICS-BASED BASEBALL PITCHING PROGRAM AND ITS IMPACT ON LOWER EXTREMITY BIOMECHANICS	Tyler Hamer, Adam B. Rosen, Samuel J. Wilkins, Brian A. Knarr
17	Poster	GROUND RESEARCH FORCES IMPROVE IN PATIENTS WITH PERIPHERAL ARTERY DISEASE WEARING ANKLE FOOT ORTHOSES	Salamifar, Z, Fallahrafti, F, Pipinos, I, Johanning, J, Rahman, H, Hassan, M, Myers, SA
18	Poster	A GAIT METRONOME IMPLEMENTATION BASED ON AUGMENTED REALITY	Md Washik Al Azad, Spyridon Mastorakis
19	Poster	JOINT MOTION IS ALTERED WHEN WALKING WITH ANKLE-FOOT ORTHOSES IN PERIPHERAL ARTERY DISEASE	Liz Staudacher, Farahnaz Fallahtafi, Hafizur Rahman, Iraklis Pipinos, Jason Johanning, Mahdi Hassan, Sara Myers
20	Poster	USABILITY OF A FEEDBACK-CONTROLLED TREADMILL IN HEALTHY ADULTS: A PILOT STUDY	Lindsey E. Remski, David Kingston, Brian A. Knarr
21	Poster	OPTIMIZATION OF MUSCULOSKELETAL SIMULATION PARAMETERS FOR ESTIMATING METABOLIC COST	Arash Mohammadzadeh Gonabadi, Prokopios Antonellis, Philippe Malcolm
22	Poster	CONTRIBUTION OF LOWER LIMB MUSCLE ACTIVATION TO CENTER OF MASS ACCELERATION DURING WALKING: EFFECT OF BODY WEIGHT	Hyun Kyung Kim, Shiuan-Huei Lu, Tung-Wu Lu, Li-Shan Chou
23	Poster	THE EFFECT OF UNILATERAL HANDRAIL USE ON NORMALIZED PEAK KNEE KINETICS IN OBESE AND HEALTHY WEIGHT INDIVIDUALS DURING STAIR NEGOTIATION	Todd Leutzinger, David Kingston, Elizabeth Wellsandt, Danae Dinkel, Brian Knarr
24	Poster	ADAPTATION TO THE REPEATED MEDIOLATERAL FOOT PLACEMENT PERTURBATIONS	Seongwoo Mun, Corbin Rasmussen, Nathaniel Hunt

POSTERS

Poster #	Presentation	Title	Authors
25	Poster	THE RELATIONSHIP BETWEEN ELBOW VALGUS STRESS AND ULNAR COLLATERAL LIGAMENT MORPHOLOGICAL CHARACTERISTICS IN BASEBALL PITCHERS	Tomohiro Ide, Tyler J. Hamer, Adam B. Rosen, Brian A. Knarr, Samuel J. Wilkins
26	Poster	DEVELOPMENT OF BILATERAL PASSIVE HIP EXOSUIT FOR STROKE SURVIVORS	Hannah Stogdill, Takashi Sado, Kayla Kowalczyk, Phillipe Malcolm, Mukul Mukherjee
27	Poster	CHANGES IN ANKLE MUSCLE FORCE AND POWER DURING WALKING IN PATIENTS WITH PERIPHERAL ARTERY DISEASE	Hafizur Rahman, Cody Anderson, Iraklis I. Pipinos, Jason M. Johanning, Jianghu Dong, Sara Myers
28	Poster	THE IMPACT OF SPORT SPECIALIZATION IN BASEBALL ON SCAPULAR KINEMATICS	Taylor Kinney, Tyler Hamer, R. Tyler Richardson, Sam Wilkins, Jorge Zuniga, Brian Knarr
29	Poster	SOFTWARE TO VIEW AND CONVERT MICROSCOPIC HISTOLOGICAL IMAGES	Sayed Ahmadreza Razian, Majid Jadidi, Alexey Kamenskiy
30	Poster	HOW TREADMILL HANDRAIL USE IMPACTS MECHANICAL GAIT STABILITY IN STROKE SURVIVORS	Oluwaseye P. Odanye, Emily A. Steffensen, Erica H. Hinton, Samuel Bierner, HaoYuan Hsiao, Brian A. Knarr
31	Poster	DESIGN OF A LIGHTWEIGHT, WEARABLE MOBILE ARM SUPPORT	Shane Hultine, Travis Vanderheyden, Brian A. Knarr
32	Poster	ASSESSMENT OF LEFT VENTRICULAR CONTRACTILITY AFTER THORACIC ENDOVASCULAR AORTIC REPAIR (TEVAR) IN SWINE	Sivapriya Devidas Kuniyil, Anastasia Desyatova
33	Poster	DEVELOPMENT OF A FLOW CIRCUIT TO REPLICATE BLOOD CIRCULATION IN AORTA	Ramin Shahbad, Anastasia Desyatova
34	Poster	LONG BREAKS IN EXTERNAL ELASTIC LAMINA OF HUMAN FEMOROPOPLITEAL ARTERIES	Elham Zamani, Majid Jadidi
35	Poster	A METHOD FOR EVALUATING THE EFFECTIVENESS OF BALLOON ANGIOPLASTY IN HUMAN FEMOROPOPLITEAL ARTERIES USING X-RAY MICROTOMOGRAPHY	Pauline Struczewska, Ramin Shahbad, Anastasia Desyatova, Alexey Kamenskiy
36	Poster	CARBON FIBER SHOE INSOLE INTERVENTION TO AUGMENT WALKING IN ELDERLY	Logan T. White, Nikolaos Papachatzis, Kota Z. Takahashi
37	Poster	THE ALTERATION IN GROUND REACTION FORCE WHILE WALKING WITH ASSISTIVE TENNIS SHOES IN PATIENTS WITH PERIPHERAL ARTERY DISEASE	Nate Evans, Hafizur Rahman, Iraklis Pipinos, Jason Johanning, Mahdi Hassan, Sara Myers

Human Movement Variability Conference



BARRY T. BATES KEYNOTE SPEAKER
DR. JAAP VAN DIEËN
VU AMSTERDAM

PRESENTATION: CENTER OF MASS STATE FEEDBACK FOR THE CONTROL OF GAIT STABILITY

Maintaining a stable bipedal gait pattern, that is to avoid falling over when walking on two legs, is challenging due to the high position of the body's center of mass (CoM), the small base of support and the CoM's movement towards the edge of or even out of the base of support on every step. Model studies suggest that phase-dependent feedback control of the CoM state is required to maintain a stable bipedal gait pattern and studies in human volunteers support the notion that CoM feedback is used to correct perturbations of gait. In this presentation, I will present recent analyses of previously collected data and published studies to assess whether phase-dependent CoM is used to stabilize unperturbed human gait, what mechanisms are used to implement this feedback control, and how sensory information is used to obtain an estimate of the CoM state. In addition, I will discuss if and how this basic knowledge can be used to improve gait stability in individual with an increase fall risk.

ABOUT DR. VAN DIEËN

Jaap van Dieën obtained his PhD from the 'Vrije Universiteit Amsterdam' in the Netherlands in 1993 and currently is professor of biomechanics and department head at the department of Human Movement Sciences of this university. He leads a research group focusing on the neuromechanics of ageing and musculoskeletal and movement disorders. His research is centered around three themes: 1) control of trunk posture and movement, 2) control of balance and gait stability and 3) the development of clinically applicable algorithms and instrumentation. The group focuses on experimental work based on movement analysis, inverse dynamics and electrophysiological measurements. Jaap van Dieën has (co-) authored over 450 papers in international scientific journals.

PODIUM SESSION 1

SURFACE AND LOCOMOTOR TASK DO NOT AFFECT THE FRACTAL CHARACTERISTICS OF GAIT VARIABILITY

Taylor J. Wilson , Nick Stergiou and Aaron D. Likens

COMPARISON OF WATERPROOF IMU JOINT KINEMATICS WITH MOTION CAPTURE: A CASE STUDY

Joseph W. Harrington, Nickolas J. Nahm , David C. Kingston

ATTENTIONAL FOCUS EFFECTS ON JOINT COVARIATION IN A REACHING TASK

Charlend K Howard , Nikita A Kuznetsov

ASSESSING MOTOR CORTEX ACTIVATION DURING A MANUAL AND VIRTUAL REALITY BOX AND BLOCK TEST

Sheridan M Parker, Brandon Lacey, Brian Ricks, Jorge Zuniga, & Brian A. Knarr

WALKING SYNCHRONIZATION TO UNSTRUCTURED VISUAL CUES INCREASES METABOLIC COST

Anaëlle E. Charles, Nicholas Stergiou and Aaron D. Likens

PROMISING STUDENT AWARD PRESENTATIONS

THE IMPACT OF FRONTAL PLANE KINEMATICS TO DISCRIMINATE FALLS FROM RECOVERIES FOLLOWING UNCONSTRAINED SLIPS

Abderrahman Ouattas, Corbin M. Rasmussen & Nathaniel Hunt

IRREGULAR METRONOMES ALTER BIMANUAL COORDINATION DYNAMICS

Kolby J Brink, Nick Stergiou, Joel Sommerfeld, and Aaron D. Likens

THE BRAIN CORRELATES OF PATTERNED PLANTAR STIMULATION DURING GAIT IN STROKE SURVIVORS

Christopher Engsberg, Takashi Sado, & Mukul Mukherjee

POSTERS

Poster #	Presentation	Title	Authors
6	Poster	THE CHANGES IN GAIT VARIABILITY PATTERN AFTER REVASCULARIZATION IN PATIENTS WITH PERIPHERAL ARTERY DISEASE	Megan Woods , Hafizur Rahman, Iraklis Pipinos, Jason Johannning, Sara Myers
7	Poster	TURNING REVEALS CHARACTERISTIC INTER-ARM COORDINATION PATTERNS IN PARKINSON'S DISEASE	Takashi Sado, Carolin Curtze, Mukul Mukherjee
8	Poster	THE INFLUENCE OF DIFFERENT NORMALIZATION METHODS ON CROSS REFERENCE QUANTIFICATION ANALYSIS	Mohammadreza Rezaie, & Farzaneh Haghighat
9	Poster	AUDITORY-MOTOR AND AUDITORY ENTRAINMENT ACROSS EFFECTORS: CAN PEOPLE WITH PARKINSON'S DISEASE WALK FASTER AFTER TRAINING FINGER MOVEMENTS?	Ryan L. Meidinger & Vivien Marmelat
10	Poster	THE RELATIONSHIP BETWEEN SELF-REPORTED DISABILITY AND NEUROCOGNITIVE HOP PERFORMANCE IN PATIENTS WITH CHRONIC ANKLE INSTABILITY	Choi JY, Andersen K , Remski LE, Knarr BA , Rosen AB
11	Poster	TEAM COORDINATION DYNAMICS OF WINNING NBA TEAMS	Alli A. Grunkemeyer , Joel H. Sommerfeld , Kolby J. Brink1 , Nick Stergiou, & Aaron D. Likens
12	Poster	CENTER OF PRESSURE OF CHILDREN WITH CEREBRAL PALSY WHILE STANDING AND TREADMILL WALKING: POSSIBLE LINKS TO DYNAMIC STABILITY	Jutharat Poomulna*, Nickolas J. Nahm, David C. Kingston
13	Poster	RELATIONSHIP OF SHOULDER STRENGTH TO KINETICS AND KINEMATICS IN COLLEGIATE BASEBALL PITCHERS	Angeleau Scott BS, Tyler J. Hamer, David C. Kingston, Adam B. Rosen, Brian A. Knarr
14	Poster	NOVEL DEEP BRAIN STIMULATION PATTERNS FOR TREATMENT OF PARKINSON'S DISEASE	Carolin Curtze , Erin L Cameron-Smith , Suhana Ahamed , Dulce M Maroni Veiga , Miguel Situ & Aviva Abosch
15	Poster	THE USE OF 3D PRINTED MODELS TO IMPROVE THE UNDERSTANDING OF COMPLEX ORTHOPEDIC TRAUMA	David Salazar , Justin Siebler MD , Jorge Zuniga

POSTERS

Poster #	Presentation	Title	Authors
16	Poster	ANALYZING THORACIC SPINE AND HIP MOBILITY AND THE EFFECTS ON KINEMATICS IN THE GOLF SWING AND ITS RELATION TO INJURY AND PERFORMANCE	Michael Servais , Garrett Eggleston , Luke Partusch , Samuel Wilkins , David Kingston, Brian Knarr
17	Poster	AN ANKLE FOOT ORTHOSIS INTERVENTION AND ASSESSMENT OF PATIENTS WITH PERIPHERAL ARTERY DISEASE USING THE i-PARIHS IMPLEMENTATION FRAMEWORK	Ayisha Z. Bashir , Danae Dinkel, Jason M. Johanning, Iraklis I. Pipinos , Paul A. Estabrooks , Sara A. Myers
18	Poster	THE EFFECT OF EXTERNAL CUES ON LOWER BACK LOADING DURING THE GOLF SWING	Garrett Eggleston, Michael Servais, Luke Partusch, David Kingston, Christopher Burcal, Brian Knarr
19	Poster	DETERMINING THE IMPACT THAT SUPERVISED EXERCISE MAKES ON THE GAIT VARIABILITY OF PATIENTS WITH PERIPHERAL ARTERY DISEASE	Alicia Andersen , Hafizur Rahman, Iraklis Pipinos, Jason Johanning, Sara Myers
20	Poster	IPSILATERAL MOTOR CORTEX DOMINANCE AND DECREASE MOTOR DEXTERITY FOLLOWING ISOLATION IN CHILDREN	Kaitlin Fraser & Jorge M. Zuniga
21	Poster	RELATIONSHIPS BETWEEN MOTOR TIMING IN DIFFERENT MOTOR EFFECTORS IN MUSICIANS AND NON-MUSICIANS	Meghan Prusia & Vivien Marmelat
22	Poster	A SYSTEMATIC REVIEW OF HUMAN ODOMETRY	Tyler Wiles, Alli Grunkemeyer, Nick Stergiou, Aaron Likens
23	Poster	DVA: IS REPLICATING THE DYNAMICS OF THE ENVIRONMENT IMPORTANT OR WILL A SIMPLE EYE CHART DO?	Stephanie Mace, & Mukul Mukherjee
24	Poster	ESTIMATION OF KNEE ADDUCTION MOMENT DURING WALKING USING WEARABLE SENSOR DATA WITH THE APPLICATION OF SEQUENCE BASED ARTIFICIAL RECURRENT NEURAL NETWORK	Yu-Pin Liang & Li-Shan Chou
25	Poster	CAN A UNILATERAL PASSIVE HIP BRACE DIMINISH WALKING ASYMMETRY?	Kayla M. Kowalczyk, Philippe Malcolm

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