

Program
Expert Scientific Meeting
on Load Distribution Measurement



July 2 - 6, 2014
Cambridge, Massachusetts, USA
The Sheraton Commander Harvard Square

June 2014 | Information subject to change without notice

Overview

Wednesday July 2nd

Site: Sheraton Commander Hotel
Registration 16:30 - 20:30
Opening Reception 19:00 - 21:00

Thursday July 3rd

Site: Sheraton Commander Hotel
Breakfast 6:30 - 8:30
Registration 7:30 - 8:30
Scientific presentations 8:30
Lunch 12:20
Scientific presentations 13:20
Posters Session 15:05
Scientific presentations 16:05
Site: Harvard Museum of Natural History
Light dinner 18:30
Tour Museum until 21:30

Friday July 4th

Site: Sheraton Commander Hotel
Breakfast 6:30 - 8:30
Morning Cambridge Tours
Cambridge Running Tour 8:15
Harvard Walking Tour 8:30
Longfellow House Tours 8:45
Bus Departure from Sheraton Hotel 10:45 sharp
Yawkey Way activities upon arrival
Boston Red Sox versus Baltimore Orioles 13:35
Bus Depart Fenway 16:30 sharp
Bay State Cruise, Boat Boarding 17:45
Whale watching cruise, dinner and fireworks 18:00
Buses return to Sheraton Commander Hotel 22:15

Saturday July 5th

Site: Sheraton Commander Hotel
Breakfast 6:30 - 8:30
Registration 8:00 - 8:30
Scientific presentations 8:30
Lunch 12:10
Scientific presentations 13:10
Posters Session 15:25
MPP Presentations 16:25
Site: Pickman Hall
art in science Performance by H. Gärtner 18:30 - 19:30
Site: Sheraton Commander Hotel
Award Presentations & Award Dinner with dancing 19:30

Sunday July 6th

Site: Sheraton Commander Hotel
Breakfast 6:30 - 8:30
Workshops in Mount Vernon Room 8:30 - 13:00



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Venue – Sheraton Commander Hotel

16 Garden Street
Cambridge, MA 02138, USA
+1 617-547-4800
www.sheratoncommander.com

- Hotel Lobby – registration
- Nubar Restaurant – opening reception, breakfast, breaks
- George Washington Ballroom – scientific sessions and award dinner
- George Washington Terrace – poster sessions
- Mount Vernon Room – lunch and workshops
- Cape Cod Room – speaker ready room
- Minuteman Room – small group meetings



Sunday, July 6th 2014

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| | novel Workshops in Mount Vernon Room, Sheraton Commander Hotel |
| 6:30 - 8:30 | Breakfast in Nubar Restaurant (for full conference attendees), Sheraton Commander Hotel |
| 8:30 - 9:15 | Workshop I How to measure load distribution correctly - sensor physics - biomechanical concepts |
| 9:15 - 9:30 | Break |
| 9:30 - 10:15 | Workshop II Practical applications for load distribution measurements in complex environments - measurements inside joints, "harsh" environment such as Ergonomics, etc. - long term monitoring of total forces in daily life |
| 10:15 - 11:00 | Break with snacks & coffee |
| 11:00 - 11:45 | Workshop III Data evaluation in clinical routine and research - data acquisition with emed and data evaluation with novel projects, expert rules & reports - Manugraphy for functional hand diagnostics in the clinic |
| 11:45 - 12:00 | Break |
| 12:00 - 12:45 | Workshop IV novel support tools and applications with various hardware systems - educational videos and web based assistance - calibration of novel systems and synchronization with peripheral systems |
| 13:00 conclusion | Wrap up/catch up |



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| Functional and Clinical Evaluation of a Biomechanical Shoe with Semi-Rigid Outsole <i>Berti, L, Lullini, G, Caravaggi, P, Leardini, A, Giangrande, A, Giannini S</i> |
| Foot Loading Under the Heel Bone of Subjects Standing in Unstable Shoes <i>Jandová, S</i> |
| Evaluation of Balancing Ability in Hemiplegic Patients Using Plantar Pressure Measurement Based on Type of Ankle-Foot Orthosis <i>Sim, W, Kim, J, Lim, S, Won, B</i> |
| Data-Driven Directions for Effective Footwear Provision in Diabetic Patients with a History of Foot Ulceration <i>Arts, MLJ, de Haart, M, Waaijman, R, Dahmen, R, Berendsen, H, Nollet, F, and Bus, SA</i> |
| Anthropo-Dynamic Research of Diabetics' Feet in Georgia <i>Shalamberidze, M, Grdzeldze M, Shalamberidze K</i> |
| Forefoot Plantar Pressures in Mild, Moderate and Severe Hallux Valgus <i>Hurn, SE, Vicenzino, BT, Smith, MD</i> |
| Pyramidal Tract Neuroaxonal Integrity Predicts Functional Status in Chronic Stroke Patients with Mild Primary Infarction <i>Dubey, P, Lioutas VA, Manor, B, Bhadelia, R, Novak, P, Selim, M, Novak V</i> |
| The Rule and Its Exceptions for Computing the Center of Pressure Excursion Index (CPEI) <i>Song, J, Pasquale, MR, Hillstrom, HJ</i> |
| Different Running Shoe Heel Designs Influence Force Distribution at the Heel Upon Impact <i>Trudeau, MB, Vienneau, J, Nigg, SR, Oda, T, Kaneko, Y, Nigg, BM</i> |

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| 12:10 - 13:10 | Lunch in Mount Vernon Room, Sheraton Commander Hotel |
| 13:10 - 13:55 | Keynote Lecture 4 Wearable and Home Monitoring Technologies for the Clinical Management of Long-Term Conditions <i>Paolo Bonato, PhD, Harvard Medical School and Motion Analysis Lab at Spaulding Rehabilitation Hospital, Boston MA, USA</i> Chair: Hillstrom, HJ |
| 13:55 - 14:25 | Invited Talk Navigating NIH <i>Mary Rodgers, PhD, NIBIB National Institutes of Health</i> Chair: Novak, V |
| 14:25 - 15:25 | Session IX: Pathology Chairs: Queen, R and Mootanah, R |
| 14:25 - 14:55 | art in science award finalist Does Partial or Complete Wrist Fusion Change the Load Distribution of the Hand During Gripping? <i>Mühdorfer-Fodor, M, Reger, A, Mittlmeier, T, Prommersberger, KJ</i> |
| 14:55 - 15:05 | Kinematic and Footprint-Based Parameters for the Classification of Functional Flatfoot <i>Giacomozzi, C, Leardini, A, Berti, L, Giannini, S, Caravaggi, P</i> |
| 15:05 - 15:15 | The Effect of Different Hallux Valgus Angles Upon First Metatarsophalangeal Joint Shear Stress: A Finite Element Study <i>Mootanah, R, Morgan, O, Mazzella, J, Reisse, R, Russell, R, Deland, JT, Ellis, SJ, Baxter, J, Hillstrom, HJ</i> |
| 15:15 - 15:25 | Multifractal Characteristics of Sway: A Comparison of Obese and Non-Obese Children <i>Shultz, SP, Fink, PW, D'Hondt, E, Lenoir, M, Hills, AP</i> |
| 15:25 - 16:25 | Session X: Poster Teasers 2, Posters & Coffee Break Chair: Mickle, K |
| 16:25 - 17:00 | Protocol for 1000 Norms Project: Clinical Catalogue of Plantar Pressure and Musculoskeletal Measures Across the Lifespan <i>Mckay, M, Baldwin, J, Simic, M, Ferreira, P, Hiller, C, Vanicek, N, Nightingale, J, Moloney, N, and Burns, J</i> |
| 17:00 | Closing Remarks <i>Vera Novak, Howard J. Hillstrom, Peter Seitz</i> |
| 18:30 - 19:30 | Evening Event Concert by Henriette Gärtner <i>The Edward M. Pickman Concert Hall at the Longy School of Music</i> |
| 19:30 - 23:30 | Award Presentations & Banquet Dinner with Dancing <i>Sheraton Commander Hotel, George Washington Ballroom</i> |

16:25 - 17:00 **MPP, Most Promising Proposal Award Presentations**
Chair: Kersting, U

18:30 - 19:30 **Evening Event**
Concert by **Henriette Gärtner**
The Edward M. Pickman Concert Hall at the Longy School of Music

19:30 - 23:30 **Award Presentations & Banquet Dinner with Dancing**
Sheraton Commander Hotel, George Washington Ballroom

ESM 2014 Program / Presentations

Welcome to ESM!

Wednesday, July 2nd 2014

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| 16:30 - 20:30 | Registration , Sheraton Commander Hotel, Lobby |
| 19:00 - 21:00 | Opening Reception , Nubar Restaurant, Sheraton Commander Hotel |

Thursday, July 3rd 2014

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| 6:30 - 8:30 | Breakfast in Nubar Restaurant (sit down), Sheraton Commander Hotel |
| 7:30 - 8:30 8:30 - 8:45 | Registration Welcome <i>Vera Novak, Howard J. Hillstrom, Peter Seitz</i> |
| 8:45 - 9:30 | Keynote Lecture 1 Design for Extreme Exploration: Self, Sea and Space <i>Dava Newman, PhD, MIT, Department of Aeronautics and Astronautics and Engineering Systems, Boston MA, USA</i> Chair: <i>Novak, V</i> |
| 9:30 - 10:30 | Session I: Rehabilitation Chairs: <i>Mickle, K and Ford, K</i> |
| 9:30 - 10:00 | art in science award finalist Retraining the Foot Muscles to Restore Toe Flexor Strength in Older People <i>Mickle, KJ, Caputi, P, Potter, JM, Steele, JR</i> |
| 10:00 - 10:10 | The Effect of 6 Weeks Rope Jumping Training on the Plantar Pressure Distribution in Pes Planus, Pes Cavus and Pes Rectus of Secondary Girl Students <i>Mimar, R, Khalil, M, Somayeh, H</i> |
| 10:10 - 10:20 | Pedography as Biofeedback System for Correction of Equinovarus Gait in Individuals with Stroke <i>Khallaf, ME</i> |
| 10:20 - 10:30 | Gait Speed as an Indicator of Endothelial Dysfunction and Chronic Inflammation <i>Pimentel, DA, Jor'dan, A, Chung, C, Manor, B, Novak, V</i> |
| 10:30 - 11:00 | Coffee Break |
| 11:00 - 11:50 | Session II: Diabetes I Chairs: <i>Sinacore, D and Song, j</i> |
| 11:00 - 11:10 | Reduced Plantar Sensation Leads to Heterogeneous Reactions in Plantar Pressure Distribution During Normal Walking <i>Lange, JS, Milani, TL</i> |

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| 11:10 - 11:20 | The Efficacy of Removable Devices to Reduce Pressure and Heal Plantar Foot Ulcers in Diabetes: A Randomized Controlled Trial <i>Bus, SA, van Netten, JJ, Manning, E, Bril, A, Spraul, M, and van Baal, S</i> |
| 11:20 - 11:30 | The Evaluation of Plantar Pressure Distribution in Type 2 Diabetic Patients Native Chinese – A Follow up Study <i>Yang, L, Hao, F, Chen, W</i> |
| 11:30 - 11:40 | A Retrospective Analysis of Peak Plantar Pressure and Shear Locations and their Association with Diabetic Ulcer Sites <i>Yavuz, M, Brem, R, Richards, SA, Garfield, K, Gray, ST, Jensen, AE, Rao, N, Delvadia, N, Flyzik, M</i> |
| 11:40 - 11:50 | Tarsal Bone Density, Alignment & Peak Plantar Stress in Adult-Acquired Neuropathic Mid Foot Deformities <i>Sinacore, DR, Gutekunst DJ, Bohnert, KL, Hastings, MK</i> |
| 11:50 - 12:20 | Session III: Shoes Chairs: <i>Pisciotta, J and Woo, H</i> |
| 11:50 - 12:00 | Method for Measuring Fluid Pressures in the Shoe-Floor Interface for Evaluating the Adequacy of Tread <i>Beschorner, KE</i> |
| 12:00 - 12:10 | The Influence of Boot and Surface Type on In-Sole Pressure and Comfort when Walking on Simulated Coal Mining Surfaces <i>Dobson, JA, Riddiford-Harland, DL, and Steele, JR</i> |
| 12:10 - 12:20 | Biomechanical Evaluation of Two Different Forefoot Relief Shoes <i>Lullini, G, Caravaggi, P, Berti, L, Leardini A, Giangrande, A, Giannini, S</i> |
| 12:20 - 13:20 | Lunch in Mount Vernon Room, Sheraton Commander Hotel |
| 13:20 - 14:05 | Keynote Lecture 2 Epidemiology and Foot Pathology: Bridging the Distance between Populations and Foot Sciences <i>Marian Hannan, ScD, Harvard Medical School and Institute for Aging Research at Hebrew SeniorLife, Boston MA, USA</i> Chair: <i>Hillstrom, HJ</i> |
| 14:05 - 15:05 | Session IV: Normative Biomechanics Chairs: <i>Kersting, U and Hillstrom, HJ</i> |
| 14:05 - 14:15 | Comparison of Peak Plantar Pressures in the Army Cadet Population: The Impact of a 6 Week Intensive Training Program <i>Thaqi, I, Gibbons, MW, Lenhoff, MW, Song, J, Neary, MT, Zifchock, RA, Pasquale, M, Hillstrom, HJ</i> |

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| 14:15 - 14:25 | Plantar Loading Differences Between Genders During an Unanticipated Side-Cut <i>Queen, RM, Carpenter AL, Garrett, WE, Butler, RJ</i> |
| 14:25 - 14:35 | The Effect of Crossed Responses on Dynamic Stability <i>Gervasio, S, Kersting, U, Farina, D, Mrachacz-Kersting, N</i> |
| 14:35 - 14:45 | How Does Step Frequency Influence Plantar Loading During Comfortable Walking? <i>Hollanders, L, Melai, T, de Lange TLH</i> |
| 14:45 - 14:55 | Comparison of Foot Length and Width Measurements: Direct in Stance Versus Calculated From Dynamic Plantar Pressure Footprint <i>Song, J, Choe, K, Adams, K, Tango, D, Pettineo, S</i> |
| 14:55 - 15:05 | Regional Foot Loading During Unweighted Running in a Lower Body Positive Pressure Treadmill <i>Ford, KR, Wirfel, LA, Doarnberger, M, Smoliga, JM</i> |
| 15:05 - 16:05 | Session V: Poster Teaser 1, Posters & Coffee Break Chair: <i>Shultz, S</i> |
| | Description of Plantar Pressure Parameters in a West Point Cadet Population: Effect of Foot Structure <i>Gibbons, M, Thaqi, I, Lenhoff, MW, Zifchock, RA, Neary, MT, Brechue, WF, Song, J, Hillstrom, HJ</i> |
| | Baropodometric Evaluation of a "Shock Absorbing" Insole in a Group of Italian Special Forces Soldiers Affected by Overload Pathologies <i>Berti, L, Lullini, G, Ortolano, M, Caravaggi, P, Leardini, A</i> |
| | Perceived Comfort & Plantar Pressure of an Energy Storing and Returning Orthosis in a Prototype Military Boot: A Pilot Study <i>Goss, DL, Bisagni, FT, Keenan, PG, Call, BP, Harney, NA, Wheelis, IE, Cavanagh, PR, Teyhen, DS, Moore, JH</i> |
| | The Correlation Between Static Measurement of Medial Longitudinal Arch and Dynamic Measurement of Arch Index <i>Shakibi, B, Mimar, R, Shakibi, V</i> |
| | Joint Mobilization Forces and Therapist Reliability in Subjects with Knee Osteoarthritis <i>Tragord, BS, Gill, NW, Silvernail, JL, Teyhen, DS, Allison, SC</i> |
| | Using Auditory Feedback to Standardize Pressure for Assessing Tender Points <i>Degenhardt, BF, Johnson, JC, Webb, SJ, Pamperin, K, Snider, EJ, Snider, KT, Hammond, T</i> |
| | Time-Varying Patterns Reveal Foot Loading Changes After Foot-Ankle Exercises for Diabetic Polyneuropathy <i>Sartor, CD, Sacco, ICN, Vigneron, V</i> |

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| | Influence of Saddle Pads on the Pressure Distribution of a Well Fitted Equine Saddle: A Pilot Study <i>Crowell, A, Gavin, A</i> |
| | The Influence of an 8-Week Rider Core Fitness Program on Pressure Distribution on the Equine Back <i>Hampson, AM</i> |
| | Evaluation of Interface Load by Angle Variation of Mattress Back Support for Automatic Excretion Handling Systems <i>Kim, J, Sim, W, Lim, S, Won, B</i> |
| | A Comparison Between emed-x and Matscan Plantar Pressure Systems <i>Hannan, MT, Dufour, AB, Lenhoff, M, Awale, A, Gibbons, MW, Hillstrom, HJ</i> |
| 16:05 - 17:15 | Session VI: Hands Chairs: <i>Mootanah, R and Hillstrom, HJ</i> |
| 16:05 - 16:35 | art in science award finalist Did the Biomechanics of Making and Using Paleolithic Stone Tools Influence the Origin of the Derived Human Thumb? <i>Williams, EM, Richmond, BG</i> |
| 16:35 - 17:05 | art in science award finalist Feedback on Force, Sound and Video Sequence of Keystroke During Piano Playing <i>Gaertner, H, Pozzo, R</i> |
| 17:05 - 17:15 | Load Distribution Within the Hand During Cylinder Grip <i>Mühdorfer-Fodor, M, Ziegler, S, Harms, C, Neumann, J, Kundt, G, Mittlmeier, T, Prommersberger, KJ</i> |
| 18:30 - 21:30 | Evening Event Harvard Museum of Natural History Hors d'oeuvres, drinks and light dinner Tour Museum |



Friday, July 4th 2014

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| | Networking day |
| 6:30 - 8:30 | Breakfast in Nubar Restaurant (sit down), Sheraton Commander Hotel |
| | Morning Cambridge Tours (leaving from the Sheraton Commander Hotel Lobby): |
| | Cambridge Running Tour 8:15 - 9:30 |
| | Harvard Walking Tour 8:30 - 9:30 |
| | Longfellow House and Garden Tours 8:45 - 10:15 |
| 10:45 | Bus Departure from Sheraton Commander Hotel to Fenway Park Yawkey Way activities upon arrival |
| 13:35 | Boston Red Sox vs. Baltimore Orioles |
| 16:30 | Bus Depart from Fenway Park to By State Cruise |
| 17:45 | Boat Boarding for Bay State Cruise |
| 18:00 - 22:00 | Whale watching cruise with dinner, drinks and fireworks |
| 22:15 | Buses return to Sheraton Commander Hotel |

Saturday, July 5th 2014

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| 6:30 - 8:30 | Breakfast in Nubar Restaurant (sit down), Sheraton Commander Hotel |
| 8:00 - 8:30 | Registration , Sheraton Commander Lobby |
| 8:30 - 9:15 | Keynote Lecture 3 Mechano-Biology: Employ Physical Cues to Initiate Tissue Regeneration <i>Georg Duda, Julius Wolff Institut at Charité – Universitätsmedizin in Berlin, Germany</i> Chair: <i>Brüggemann, G-P</i> |
| 9:15 - 10:25 | Session VII: Diabetes II Chairs: <i>Bus, S and Sacco, I</i> |
| 9:15 - 9:45 | art in science award finalist Clinical Value of Temperature in Assessing Foot Loading in Diabetic Patients with and without Neuropathy <i>Yavuz, M, Brem, R, Richards, SA, Garfield, K, Gray, ST, Jensen, AE, Rao, N, Delvadia, N, Flyzik, M</i> |

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| 9:45 - 9:55 | High Plantar Loading and Low Bone Strength Lead to Increased Metatarsal Strain in Individuals with Diabetes and Neuropathy <i>Gutekunst, DJ, Bohnert, KL, Hastings, MK, Kaufman, KR, and Sinacore DR</i> |
| 9:55 - 10:05 | Predictors of Barefoot Plantar Peak Pressure in Patients with Diabetes, Peripheral Neuropathy and a History of Ulceration <i>Bus, SA, Barn, R, Waaijman, R, Woodburn, J, and Nollet, F</i> |
| 10:05 - 10:15 | Biomechanical Sequences of Minor Amputations in Patients With Diabetes Mellitus <i>Tsvetkova, TL, Bregovskiy, VB</i> |
| 10:15 - 10:25 | Clinical and Foot Loading Changes After Foot and Ankle Exercise Intervention for Diabetic Polyneuropathy <i>Sartor, CD, Giacomozzi, C, Sacco, ICN</i> |
| 10:25 - 10:50 | Coffee Break |
| 10:50 - 12:10 | Session VIII: Pressure Assessment Instrumentation Chairs: <i>Steele, J and Yavuz, Y</i> |
| 10:50 - 11:10 | Invited Talk Technical Standards for PMDs <i>Claudia Giacomozzi, PhD, Istituto Superiore di Sanità, Rome</i> |
| 11:10 - 11:20 | Identifying Pressure Ulcer Risk of Patient Handling Sling Use with Interface Pressure Mapping <i>Peterson, MJ, Gutmann, J, Harrow, J Kerrigan, M, Kahn, J</i> |
| 11:20 - 11:30 | Feasibility of Wearable Motion Capture System Using Inertial Motion Capture Sensors and In-Shoe Pressure System <i>Kim, HK, Khurelbaatar, T, Dorj, A, Kim, K</i> |
| 11:30 - 11:40 | Ground Reaction Force Computation Tool for OpenSim Using Zero Moment Point Method <i>Dijkstra, EJ, Gutierrez-Farewik, EM</i> |
| 11:40 - 11:50 | A Comparative Study of two Methods for Grip Force Monitoring on the Hand: Manugraphy System Versus Jamar Dynamometer <i>Mühdorfer-Fodor, M, Ziegler, S, Harms, C, Neumann, J, Kundt, G, Mittlmeier, T, Prommersberger, KJ</i> |
| 11:50 - 12:00 | Investigation on the Effects of Billet Placement on a Well Fitted Equine Saddle: A Pilot Study <i>Crowell, A, Gavin, A</i> |
| 12:00 - 12:10 | Testing the Pressure Produced Under Compression Garments: Comparison of Measurement Devices Used in the Clinical Setting <i>McLaughlin, P</i> |