

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



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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**

	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	<b>Workshop I</b> How to measure load distribution correctly - sensor physics - biomechanical concepts
9:15 - 9:30	Break
9:30 - 10:15	<b>Workshop II</b> 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	<b>Workshop III</b> 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	<b>Workshop IV</b> 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



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

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

17:00 **Closing Remarks**  
*Vera Novak, Howard J. Hillstrom, Peter Seitz*

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*

12:10 - 13:10	Lunch in Mount Vernon Room, Sheraton Commander Hotel
13:10 - 13:55	<b>Keynote Lecture 4</b> 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	<b>Invited Talk</b> Navigating NIH <i>Mary Rodgers, PhD, NIBIB National Institutes of Health</i> Chair: Novak, V
14:25 - 15:25	<b>Session IX: Pathology</b> Chairs: Queen, R and Mootanah, R
14:25 - 14:55	<b>art in science award finalist</b> 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	<b>Kinematic and Footprint-Based Parameters for the Classification of Functional Flatfoot</b> <i>Giacomozzi, C, Leardini, A, Berti, L, Giannini, S, Caravaggi, P</i>
15:05 - 15:15	<b>The Effect of Different Hallux Valgus Angles Upon First Metatarsophalangeal Joint Shear Stress: A Finite Element Study</b> <i>Mootanah, R, Morgan, O, Mazzella, J, Reisse, R, Russell, R, Deland, JT, Ellis, SJ, Baxter, J, Hillstrom, HJ</i>
15:15 - 15:25	<b>Multifractal Characteristics of Sway: A Comparison of Obese and Non-Obese Children</b> <i>Shultz, SP, Fink, PW, D’Hondt, E, Lenoir, M, Hills, AP</i>
15:25 - 16:25	<b>Session X: Poster Teasers 2, Posters &amp; Coffee Break</b> Chair: Mickle, K
	<b>Protocol for 1000 Norms Project: Clinical Catalogue of Plantar Pressure and Musculoskeletal Measures Across the Lifespan</b> <i>Mckay, M, Baldwin, J, Simic, M, Ferreira, P, Hiller, C, Vanicek, N, Nightingale, J, Moloney, N, and Burns, J</i>
	<b>Influence of Shoe Cushioning and Running Experience on Plantar Pressure Distribution in Recreational Runners</b> <i>Ribeiro, AP, Dinato, RC, Tessutti, V, João, SMA, Sacco, ICN</i>
	<b>Research on The Vertical Ground Reaction Force of Midsole Hardness in High Heels</b> <i>Hao, F, Yang, L, He, Y</i>

# ESM 2014 Program / Presentations

Welcome to ESM!

## Wednesday, July 2nd 2014

16:30 - 20:30	<b>Registration</b> , Sheraton Commander Hotel, Lobby
19:00 - 21:00	<b>Opening Reception</b> , Nubar Restaurant, Sheraton Commander Hotel

## Thursday, July 3rd 2014

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

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

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

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



## Friday, July 4th 2014

	<b>Networking day</b>
6:30 - 8:30	<b>Breakfast</b> in Nubar Restaurant (sit down), Sheraton Commander Hotel
	<b>Morning Cambridge Tours (leaving from the Sheraton Commander Hotel Lobby):</b>
	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

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

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