

update: <b>Preliminary Program: 3rd International Workshop on Spine Loading and Deformation</b>		
09. Apr 19 <b>Thursday, July 4th</b>		
12.45-13.00	<b>Welcome</b>	<b>Organizers: Hendrik Schmidt, Saeed Shirazi-Adl, Idsart Kingma</b>
<b>Session 1</b>	<b>Intervertebral disc - Tissue Mechanics</b>	<b>Moderators: Peter-Paul Vergroesen , Grace O'Connell</b>
13.00 - 14.00	Benjamin A. Walter Kaj Emanuel Grace D. O'Connell Farshid Ghezalbash	In-vitro Measurements of Osmotic Pressure within the Intervertebral Disc Time dependent behavior of pressure and height of a loaded intervertebral disc are inconsistent Annulus Fibrosus Hydration Affects Rate-Dependent Failure Mechanics In Tension On the modeling of human disc annulus fibrosus: Elastic, yield and failure responses
14.00-14.20	<b>Coffee Break</b>	
14.20 - 15.20	Nicolas Newell Rivera Tapia Magdalena Wojtków Philip Poillot	Internal deformations in human intervertebral discs: a 9.4T MRI study In-vitro perspective into micro-structural degeneration of the intervertebral disc: a biomechanical approach Collagen fiber bundles disintegration during pull-out from the endplate Voltage-Gated Ion Channels in Intervertebral Disc Mechanotransduction
15.20-15.50	all	<b>Open Discussion</b>
15.50-16.20	<b>Coffee Break</b>	
<b>Session 2</b>	<b>Debate on mechanical load, injury, degeneration and pain</b>	<b>Moderators: Saeed Shirazi-Adl, Hendrik Schmidt</b>
16.20 - 17.20	Saeed Shirazi-Adl Peter-Paul Vergroesen Daniel Belavy Jill Urban	Opening Presentation: Low back pain paradox Intervertebral disc degeneration from a biomechanical point of view: What do we need to fix? Spine postures, physical exposure, and back pain: a systematic review of systematic reviews Interactions between genetics and loading in development of disc degeneration and low back pain – a review
17.20-18.00	all	<b>Open Discussion</b>
18.00-20.00	<b>Happy Hour with Beer &amp; Pretzel</b>	

<b>Friday, July 5th</b>		
<b>Session 3</b>	<b>Motion Segments: Load Sharing</b>	<b>Moderators: Babak Bazrgari, William Anderst</b>
08.00 - 09.30	Marwan El-Rich Maxim Bashkuev Nicolas Damm Luigi La Barbera Mohammad Nikkhoo Idsart Kingma	Review of load-sharing in intact, transected, degenerate and surgically altered passive human lumbar spines Relationship between intervertebral disc and facet joint degeneration: a probabilistic finite element model study Lumbar spinal ligament characteristics extracted from stepwise reduction experiments allow for precise modeling Detailed full-filed analysis of the ventral lumbar spine: insights on the biomechanical role of the anterior longitudinal ligament Effects of Lumbar Lordosis on Mechanical Response of Post-operative Lumbar Spine- Personalized Parametric Finite Element Simulations Biomechanical properties in motion of lumbar spines with degenerative scoliosis
09.30-10.00	all	<b>Open Discussion</b>
10.00-10.30	<b>Coffee Break</b>	
<b>Session 4</b>	<b>Lumbar Spine I: Shape &amp; Kinematics</b>	<b>Moderators: Andre Plamondon, William Marras</b>
10.30 - 12.00	Sandra Reitmaier Alexander Breen Fumin Pan Stephen H. M. Brown Fabio Galbusera Thomas Zander	Review article on spine kinematics of quadrupeds and bipeds Dynamic interactions between lumbar intervertebral motion segments during forward bending Sex-dependent difference in lumbo-pelvic coordination for different lifting tasks A novel model and experimental validation demonstrate the large contribution of passive muscle to spine flexion relaxation Calculating the three-dimensional vertebral orientation from a planar radiograph: is it feasible? Which landmark is best suited to assess the thoracic orientation?
12.00-12.30	all	<b>Open Discussion</b>
12.30-14.00	<b>Lunch Break</b>	
<b>Session 5</b>	<b>Lumbar Spine II: Loads &amp; Kinematics - Injury/Degeneration/Pain</b>	<b>Moderators: Navid Arjmand, Daniel Belavy</b>
14.00 - 15.30	Philipp Damm Gert S. Faber Babak Bazrgari William Anderst Shirin Yazdani  Sebastiano Caprara	In vivo hip and lumbar spine implant loads during activities in forward bent postures Bottom-up versus top-down L5/S1 moment estimation during manual lifting using an ambulatory measurement system A prospective study of lumbo-pelvic coordination in patients with non-chronic low back pain Patient-Specific Changes in Adjacent Segment Kinematics After Lumbar Decompression and Fusion The impact of curve severity on the pelvic kinematic and erector spinea and gluteusmedius muscles activity during gait in patients with adolescent idiopathic scoliosis Automatic Generation of Patient-Specific FE Models of the Lumbar Spine
15.30-16.00	all	<b>Open Discussion</b>
16.00-16.30	<b>Coffee Break</b>	
<b>Session 6</b>	<b>Spinal Loads – In Vivo Measurements + Modeling</b>	<b>Moderators: Idsart Kingma, Ameet K. Aiyangar</b>
16.30 - 18.00	Axel S. Koopman Ali Firouzabadi Andre Plamondon Ameet K. Aiyangar William Marras Christian Affolter	Effect of a passive exoskeleton on mechanical loading during dynamic lifting. Sex-dependant estimation of spinal loads during static manual material handling activities- combined in vivo and in silico analyses Subject-specific regression equations to estimate spinal loads in asymmetric static lifting Sensitivity of Musculoskeletal Model-based Lumbar Spinal Loading Estimates to Type of Kinematic Input and Passive Stiffness Properties Assessment of Spine Loading via a 2 Muscle Model vs. 10 Muscle Model during One vs. Two Handed Lifting Tasks Estimating Lumbar Passive Stiffness Behaviour from Subject-Specific Finite Element Models and In Vivo 6DOF Kinematics
18.00-18.30	all	<b>Open Discussion</b>
19.00-23.00	<b>Social Event: Dinner</b>	

<b>Saturday, July 6th</b>		
<b>Session 7</b>	<b>Spinal Loads – Computational Models</b>	<b>Moderators: Dominika Ignasiak, Fabio Galbusera</b>
08.00 - 09.15	Dominika Ignasiak Stefan Schmid Navid Arjmand  Xuguang Wang Marco Senteler	A novel method for prediction of postoperative global sagittal alignment based on full-body musculoskeletal modeling and posture optimization Predicting intervertebral disc loading and trunk muscle activity in healthy adolescents using musculoskeletal full-body models Coupled Artificial Neural Networks to Predict Whole Body Posture, Lumbosacral Moments, Trunk Muscle Forces, and Lumbar Disc Loads during Three-dimensional Material Handling Activities Influence of seat parameters on computationally predicted spine loading Statistical Shape Model Predicted Alignments and Musculoskeletal Simulation in Surgical Planning
09.15-09.35	all	<b>Open Discussion</b>
09.35-10.30	<b>Coffee to Go - Poster Session</b>	
<b>Session 8</b>	<b>Trunk Stabilization / Control</b>	<b>Moderators: Jaap van Deen, Chruiatian Larivière</b>
10.30 - 12.15	Jaap van Dieën Seyyed M. Sohokouhyan  Juliane Mueller Christian Larivière Iraj Dehghan-Hamani Michiel Punt Ali Tabasi	Trunk stabilization in patients with low-back pain and healthy controls Indication of diagnostic criteria for proprioception disorders between non-specific low back pain patients and healthy people based on analysis of linear and nonlinear parameters of center of pressure and trunk stability Sudden gait perturbations elicit sex-specific neuromuscular trunk responses in persons with low back pain Can trunk postural control during unstable sitting be considered a proxy measure of dynamic lumbar stability? Biomechanics of Intra-Abdominal Pressure in Spine Stiffening and Loading - A Systematic Review of in vivo and Modeling Studies Real-time feedback to reduce lower back moment while lifting a box: a proof-of-concept-study Reducing the number of input variables required to control an active exoskeleton
12.15-12.45	all	<b>Open Discussion</b>
12.45-13.00	<b>Final Words</b>	
13.00-14.00	<b>Lunch</b>	

## Poster

**Saturday, July 6th 09.35-10.30**

no.	Coffee to Go - Poster Session	
P1	Małgorzata Żak	Influence of the facet joints on the mechanical behaviour of the intervertebral disc: the numerical and experimental analysis
P2	Timothy Holsgrove	Beyond Preload - The replication of six-axis in-vivo load data using a spine simulator
P3	Xiang-Yao Sun	Two-level fusion versus topping-off technology based on Coflex in the treatment of lumber degenerative disease: a biomechanical effect comparison
P4	Remco Doodkorte	Sublaminar tape as alternative and addition to pedicle screws in spinal surgery
P5	Marwan El-Rich	Effects of the Nucleus Migration during Forward Flexion on the Biomechanics of the L4-5 Functional Spinal Unit
P6	Marwan El-Rich	Sensitivity of Musculoskeletal Model Predictions in Neutral Standing and Forward Flexion Postures to Center of Rotation Location
P7	Nicolas Damm	A new method for validation of an individual forward dynamics model of the lumbar spine
P8	A. Shirazi Beheshtiha	Computational modeling for new surgical treatment in early-onset scoliosis
P9	Enrica Papi	Single rigid segment versus multi-segmental approach for the analysis of the lumbar spine in low back pain
P10	Han Zhang	Loads on low back during dishwashing
P11	Dietmar Rafolt	Smart Rotational Spine Protector (RSP) for Sport and Rehabilitation
P12	Kinda Khalaf	Biomechanical Evaluation of PEEK Semi-Rigid Fixation Subject to Static and Cyclic Loading
P13	Seyyed M. Shokouhyan	Using SHARIF-HMIS Inertial Sensor for Measurement and Comparison of Kinematic Parameters in 3 Subgroups of STarT Back Screening Tool in Patients with Nonspecific Low Back Pain
P14	Babak Bazrgari	Risk for fatigue-related degeneration of the L5-S1 disc among persons with vs. without unilateral lower limb amputation