
Program Podium Presentations

Sunday August 8

Main Lecture Hall

18:30 - 19:30	Wartenweiler Memorial Lecture Crossbridge action: Present views, prospects, and unknowns. <i>Huxley</i>	(Chair: Herzog) 2
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Lecture Hall A

Monday August 9

08:00 - 08:30	Invited Lecture Simple models of muscle action in human movement. <i>Alexander</i>	(Chair: Herzog) 14
08:30 - 09:45	Muscle Symposium 1 Mechanical properties of muscle-tendon complex in sprinters. <i>Fukunaga, Kubo</i> A non-invasive approach for assessing muscle-tendon interactions in-vivo. <i>Hawkins, Urlando</i> Muscle function in swimming tunas. <i>Shadwick</i> Effect of series elasticity of plantar flexors on human squat jump performance. <i>Bobbett</i> Swimming vs terrestrial gait: Locomotor constraints associated with contrasting ... <i>Biewener, Corning</i>	(Chair: Herzog, Alexander) 40 41 42 43 44
10:15 - 11:30	ISEK/ISB Symposium - Muscle 1 Muscular and mechanical factors affecting muscle output during jumping. <i>Finni, Komi</i> Estimation of knee joint moments using an EMG-driven musculoskeletal model. <i>Besier, Lloyd</i> Velocity and activation type dependence of muscle tension during maximal and ... <i>Pinniger, Steele</i> Effect of shortening speed on force depression during voluntary muscle contraction. <i>Lee, Suter</i> Changes in voluntary and evoked plantar flexion torque during repetitive maximal ... <i>Kawakami, Amemiya</i>	(Chair: Rau, Arsenaull) 64 65 66 67 68
11:45 - 12:30	Keynote Lecture Studies of human locomotion: Past, present and future. <i>Andriacchi</i>	(Chair: Vaughan) 3
13:30 - 14:00	Invited Lecture The foot as a sensory organ. <i>Cavanagh</i>	(Chair: Siegler) 18
14:00 - 15:15	Foot and Ankle Symposium Movement coupling at the ankle during running. <i>Stacoff, Nigg</i> In vitro and in vivo determination of ankle joint and subtalar joint axes using the ... <i>Alt, Jacob</i> 3D analysis of the peritalar complex using MR imaging in live humans. <i>Stindel, Udupa</i> Biomechanics of the unstable ankle joint and clinical implications. <i>Hintermann, Sasse</i> Discussion	(Chair: Siegler, Cavanagh) 88 89 90
15:45 - 17:00	Foot and Ankle A graphics-based, anatomically detailed, forward dynamic simulation of the ... <i>Ledoux, Hillstrom</i> A soft tissue model for the foot. <i>Guler, Turner</i> Development of a clinical instrument to measure heel pad stiffness. <i>Rome, Webb</i> Effects of foot type biomechanics and diabetic neuropathy on foot function. <i>Song, Hillstrom</i> Effects of surgical treatment of functional ankle joint stabilisation. <i>Lohrer, Alt</i>	(Chair: Cavanagh, Stacoff) 110 111 112 113 114

08:00 - 08:30	Invited Lecture Animating human athletes. <i>Hodgins</i>	(Chair: Vaughan) 15
08:30 - 09:45	Computer Simulation Symposium The role of sensory feedback during cyclic locomotor activities. <i>Gerritsen, Nagano</i> Neuro-muscular controlled virtual human locomotion. <i>Ogihara, Yamazaki</i> Computer modelling of the human locomotion system, with anatomical joint constraints. <i>Lu, O'Connor</i> Simulation and analysis of the electromyographic signal during muscle fatigue. <i>Lowery, Vaughan</i> The little neural network that could - or could it? A critical view of neural ... <i>Sepulveda</i>	(Chair: Vaughan, Hodgins) 46 47 48 49 50
10:15 - 11:30	Locomotion 1 Finite helical axes of the tibiofemoral joint during locomotion. <i>Reinschmidt, van den Bogert</i> A motion tracking algorithm for gait analysis. <i>Shafiq, Turner</i> Human gait analysis with synchronous 3D kinematic measurement and video. <i>Lanshammar, Ewerlid</i> Comparison of inverse dynamics calculated by two and three dimensional models ... <i>Alkjaer, Simonsen</i> Neurocomputational unsupervised clustering for pattern recognition of mechanical ... <i>Tucker, McGibbon</i>	(Chair: Prilutsky, Schoellhorn) 70 71 72 73 74
13:30 - 14:00	Invited Lecture Physical capacities, cognitive/behavioral and medical status, and mobility performance ... <i>Schultz</i>	(Chair: Grabiner) 19
14:00 - 15:15	Aging and Locomotion Symposium Effects of age on obstacle avoidance during human locomotion. <i>Ashton-Miller</i> Age-related deficits in walking mechanics and energy cost. <i>Martin</i> Reactive balance strategies in response to an accelerated support surface. <i>Owings, Pavol</i> Biomechanical determinants of balance recovery by stepping. <i>Robinson</i> From protective stepping to limb collapse: A new experimental paradigm for studying ... <i>Pai</i>	(Chair: Grabiner, Martin) 92 93 94 95 96
15:45 - 17:00	Locomotion 2 Vertical movement of the trunk in human walking. <i>Childress, Gard</i> Fatigue influence on the plantar pressure asymmetry during walking. <i>Moretto, Bisiaux</i> Moment-angle relationship at hip, knee and ankle joints during stair climbing. <i>Frigo, Rabuffetti</i> The effect of dynamic versus static approaches for stair climbing. <i>Nadeau, McFadyen</i> Age related stair climbing differences within a male and female population. <i>Oakley, Costigan</i>	(Chair: Reinschmidt, Ounpuu) 116 117 118 119 120

Monday August 9

Lecture Hall B	
08:00 - 08:30	Invited Lecture (Chair: Schaff) Progress towards the prevention of anterior cruciate ligament injuries in alpine skiing ... 16 <i>Hull</i>
08:30 - 09:45	Winter Sport Symposium (Chair: Schaff, Hull) Towards the creation of a new release envelope for protecting the knee in alpine skiing. 52 <i>Greenwald</i> Neurophysiological aspects of carving. 53 <i>Mester</i> Forces and moments at the boot sole during carving. 54 <i>Nachbauer, Schindelwig</i> Application of biomechanical methods in the development of safety equipment in ... 55 <i>Senner, Wallrapp</i> The role of biomechanics in the training process of top class alpine ski racers. 56 <i>Muller, Raschner</i>
10:15 - 11:30	Sport 1 (Chair: McNitt-Gray, Schwameder) Simulated ski jumping take-off in wind tunnel. 76 <i>Virmavirta, Kivekas</i> Wind tunnel experiments and optimization study on ski jumping. 77 <i>Seo, Kimura</i> Temporal patterns in classical cross-country skiing. 78 <i>Tveit, Eikrehaugen</i> A 2-dimensional model for downhill skiing including friction - Effects of skier's motions. 79 <i>Schmiedmayer, Rautner</i> Simulation of typical skiing situations concerning the chattering effect of alpine ... 80 <i>Niessen, Muller</i>
13:30 - 14:00	Invited Lecture (Chair: Van Gheluwe) Using models to investigate control strategies. 20 <i>Yeadon</i>
14:00 - 15:15	Sport Simulation Symposium (Chair: Yeadon, Van Gheluwe) Examining the theory behind the bubble shaft: A simulation approach. 98 <i>Springs, Neal</i> Simulation of the tennis stroke using a flexible racket model. 99 <i>Glitsch, Schlarb</i> A biomechanical explanation of the effect of arm actions on the vertical velocity of ... 100 <i>Dapena</i> A two dimensional model of water skiing. 101 <i>Koerner, Garay</i> Multi-objective optimization of sport movements using forward dynamics. 102 <i>van den Bogert</i>
15:45 - 17:00	Sport 2 (Chair: Neptune, Dapena) Effect of muscle length on joint moment and power during sprint starts. 122 <i>Mero, Kuitunen</i> Dynamical analysis of hammer throw. 123 <i>Lin, Liu</i> A three-dimensional evaluation of subtalar pronation at heel impact during take-off ... 124 <i>van Gheluwe, Roosen</i> Three dimensional kinetic analysis of the throwing arm and torso motion for elite ... 125 <i>Ae, Shimada</i> Inter-individual differences of movement patterns in javelin throw. 126 <i>Menzel</i>

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08:00 - 08:30	Invited Lecture (Chair: Brand) Stimulation of bone formation by high frequency, low magnitude, mechanical ... 17 <i>Rubin</i>
08:30 - 09:45	Bone Symposium (Chair: Brand, Rubin) A FEM-enhanced DXA prediction of femoral neck fracture. 58 <i>Testi, Viceconti</i> Finite-element predictions of bone remodelling in the turkey ulna: Effect of ... 59 <i>Taylor, Warner</i> Image-guided assessment of local bone failure. 60 <i>Muller</i> Design, manufacturing and testing of skeletal engineering scaffolds. 61 <i>Hollister, Chu</i> Do human bone cells respond at continuum level in-vivo strain magnitudes?. 62 <i>Brand, Stanford</i>
10:15 - 11:30	Orthopedics 1 (Chair: Stüssi, Bach) Impulse loading condition modeled from in vivo joint separation. 82 <i>Northcut, Komistek</i> Stem stability prediction after total hip arthroplasty. 83 <i>Toshev, Lalova</i> Quantification of duration and frequency of every day activities in total hip patients ... 84 <i>Morlock, Bluhm</i> Elastohydrodynamic lubrication analysis of UHMWPE total hip joint replacements ... 85 <i>Jagatia, Jalali</i> Experimental evidence of lubrication in a metal-on-metal total hip replacement. 86 <i>McNie, Dowson</i>
13:30 - 14:00	Invited Lecture (Chair: Shrive) Quantitative swelling for cartilage property determinations in small animal joints. 21 <i>Setton</i>
14:00 - 15:15	Cartilage and Tissue Repair Symposium (Ch.: Shrive, Setton) Adaptation of articular cartilage to mechanical stress. 104 <i>Wong</i> Controlling the biological remodeling of graft tissue following transplantation ... 105 <i>Muldrew, Liu</i> Towards a small animal model for ligament healing and remodeling. 106 <i>Blankevoort, Sierevelt</i> Neurovascular adaptation to ligament trauma and the effect of suture repair. 107 <i>McDougall, Yeung</i> Organ system adaptations to cruciate ligament insufficiency <i>Matyas</i>
15:45 - 17:00	Orthopedics 2 (Chair: O'Connor, Mueller) In vivo motion of the LCS rotating platform TKA. 128 <i>Komistek, Dennis</i> Vibration arthrometry in the patients with failed total knee replacement. 129 <i>Jiang, Lee</i> Development of the bioceramic knee endoprosthesis. 130 <i>Konvickova, Sida</i> The physiological tibia test. 131 <i>Heinlein, Frei</i> Utilization of an automated model fitting process to determine kinematics of TKA. 132 <i>Sarajak, Hoff</i>

Tuesday August 10

Main Lecture Hall

08:00 - 08:30	Invited Lecture (Chair: Engsborg) Objective measures in clinical decisions for children with cerebral palsy. 22 <i>Sutherland</i>
08:30 - 09:45	Cerebral Palsy Gait Symposium 1 (Chair: Engsborg, Ross) Gait Analysis in treatment decision-making for children with cerebral palsy. 134 <i>Ounpuu</i> Predicting functional effects of surgical outcomes. 135 <i>Richards, Niller</i> Dynamic simulation of stiff knee gait. 136 <i>Delp, Piazza</i> Quantitative evaluation of spasticity in patients with stiff-knee gait. 137 <i>Lebiedowska, Fisk</i> The effects of standard polypropylene and dynamic ankle-foot orthoses on muscle ... 138 <i>Hall, Bowker</i>
10:15 - 11:30	Cerebral Palsy Gait Symposium 2 (Chair: Engsborg, Ross) A neuromuscular basis for why some children respond better to serial casting ... 156 <i>Brouwer</i> Using energy consumption to determine orthotic prescription in children with ... 157 <i>Thomas, Buckon</i> Strength and spasticity measures in clinical decisions for selective dorsal rhizotomy ... 158 <i>Ross, Engsborg</i> Discussion I Discussion II
11:45 - 12:30	Keynote Lecture (Chair: Zernicke) Neural control of vertebrate locomotion - From ion channels and transmitters to networks ... 164 <i>Grillner</i>
13:30 - 14:00	Promising Young Scientist Award (Chair: Blankevoort) Desk-top micro-tomographic imaging and applications to bone research. 10 <i>Müller</i>
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15:45 - 17:00	Orthopedics 4 (Chair: Ronsky, Hasler) Biomechanical testing of locked and non-locked anterior reconstruction methods ... 202 <i>Rehbein, Nassutt</i> Effect of an experimental instrumentation system on the biomechanical properties ... 203 <i>Lysack, Yen</i> Effect of annular incision type on the biomechanical properties in a herniated ... 204 <i>Natarajan, Andersson</i> Investigation of screw anchor formats used in anterior spinal surgery. 205 <i>Kimpton, Runciman</i> Relation between strap tension and brace pressure in the treatment of idiopathic ... 206 <i>Petit, Aubin</i>

Lecture Hall A

08:00 - 08:30	Invited Lecture (Chair: Norman) Important strategies for safe manual handling: Shoulder positioning and load ... 23 <i>Gagnon</i>
08:30 - 09:45	Back Symposium (Chair: Norman, Gagnon) The role of footwork in asymmetrical manual materials handling (MMH). 140 <i>Delisle, Gagnon</i> Motor control during lifting under microgravity conditions. 141 <i>Kingma, Toussaint</i> Manual material handling to and from a simulated industrial bin: Effects on ... 142 <i>McKean, Potvin</i> Discussion I Discussion II
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14:00 - 15:15	Ergonomics 2 (Chair: Dumas, Stevenson) A survey of the intramuscular pressure in two shoulder muscles for arm positions ... 184 <i>Palmerud, Sporrang</i> Are biomechanical measures sufficient for assessing the usability of hand-tools? 185 <i>Takala, Freund</i> Effect of cycle time on muscular fatigue during a psychophysical study of screw ... 186 <i>Moore, Wells</i> Forearm extensor muscle fatigue in young and elderly subjects induced by four ... 187 <i>Jensen, Laursen</i> Elbow and wrist joint forces during occupational pick and place activities. 188 <i>Chadwick, Nicol</i>
15:45 - 17:00	Biomechanics of the Elderly (Chair: Nelson, Kaneko) Gender differences within a senior population during the performance of stair climbing. 208 <i>Oakley, Costigan</i> The elderly people lift the toe more than young adults when walking. 209 <i>Kaneko, Hasegawa</i> Gait characteristics of older women who ambulate with the use of a wheel-walker. 210 <i>Simoneau, Harris</i> The research on the relationship of senescence and gait index of elderly people. 211 <i>Zhao, Zhou</i> Discussion

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Tuesday August 10

Lecture Hall B

08:00 - 08:30	Invited Lecture (Chair: Komi) Enhancing performance in sport through biomechanics. 24 <i>Miyashita</i>
08:30 - 09:45	Enhancing Performance Symposium (Ch.: Elliott, Miyashita) Enhancing throwing performance and safety through biomechanics. 144 <i>Fleisig, Andrews</i> The link between fast bowling technique and disc degeneration in young cricketers: ... 145 <i>Elliott, Khangure</i> Sport performance enhancement through developmental biomechanics. 146 <i>Sakurai</i> Practical consequences of biomechanically determined individuality and fluctuations ... 147 <i>Schollhorn</i> The importance of goals and constraints in performance. 148 <i>Caldwell</i>
10:15 - 11:30	Sport 3 (Chair: Brüggemann, Wilson) Influence of approach velocity on long jump performance. 166 <i>Sorensen, Simonsen</i> Joint kinetics differences during the inward and reverse diving takeoffs. 167 <i>Mathiyakom, McNitt-Gray</i> Dynamics of sub-maximal jumping: A pilot-study. 168 <i>Aerts, Vanrenterghem</i> Anthropometric differences affect long jump performance. 169 <i>Sorensen, Hanson</i> Load distribution modifications in two multijoint tasks with different mechanical ... 170 <i>Costa, McNitt-Gray</i>
14:00 - 15:15	Biomechanical Techniques 1 (Chair: Pandy, Nicol) Effect of camera location on variables of 3D motion analysis. 190 <i>Salo, Grimshaw</i> Recognition of subtle feature of TKR patient gait, through wavelets. 191 <i>Verdini, Leo</i> Morphological algorithm to track markers in 3D kinematic data analysis. 192 <i>Barros, Figueroa</i> The use of global positioning systems (GPS and DGPS) for the tracking of ... 193 <i>Hennig, Sterzing</i> Tracking human motion from images by matching of a 3D model. 194 <i>Halvorsen, Lanshammar</i>
15:45 - 17:00	Biomechanical Techniques 2 (Chair: Hennig, Lanshammar) Neurocomputational approaches to pattern recognition and time-series analysis of ... 214 <i>Tucker, White</i> Upper limb kinematics and dynamics: The development & validation of a ... 215 <i>Murray, Johnson</i> Evaluation of human motion using biomechanical integration: a synchronized ... 216 <i>Ariel, Brond</i> Errors in spinal kinematics using 2D-projections of skin markers. 217 <i>Faber, Schamhardt</i> A method for calibration of upper-limb kinematic data from an electromagnetic ... 218 <i>Djupsjobacka, Lonn</i>

Lecture Hall C

08:00 - 08:30	Invited Lecture (Chair: Martin) Control of postural stability via change-in-support reactions: Effects of aging on ... 25 <i>Maki, McIlroy</i>
08:30 - 09:45	Aging and Posture Symposium (Chair: Martin, Grabiner) Adaptation of posture control in patients with peripheral and central neurological ... 150 <i>Horak, Shupert</i> A unifying platform for characterizing balance recovery responses from ... 151 <i>Patla</i> Adaptive control of stepping for balance recovery in young and older adults. 152 <i>Rogers, Cain</i> Posture control model of contributions to increased unsteadiness in elderly. 153 <i>Kuo, Speers</i> An intense tai chi intervention and prevention of falls in older adults transitioning to frailty. 154 <i>Gregor, Wolf</i>
10:15 - 11:30	Movement and Posture 1 (Chair: Sekiguchi, Hoffer) Disturbance type and gait speed affect impact location and fall direction. 172 <i>Smeesters, Hayes</i> Gait deviations in response to galvanic vestibular stimulation. 173 <i>Kirtley</i> Control mechanism of human jump landings due to an unexpected disturbance. 174 <i>Newman, Wu</i> Change in human body orientation and center of mass in upright stance. 175 <i>Wu, Macleod</i> Specific changes on multivariate descriptors of human postural sway for different ... 176 <i>van der Kooij, Cordero</i>
14:00 - 15:15	Clinical Biomechanics 1 (Chair: Rosenbaum, Grabiner) Hindfoot and forefoot biomechanics of children with clubfoot. 196 <i>Davies, Kiefer</i> Dimensionless comparison of plantar pressure in hemiparetic (Children vs Middle-aged). 197 <i>Moretto, Femery</i> Gait asymmetries in patients with idiopathic scoliosis as measured by plantar ... 198 <i>Perttunen, Valipakka</i> Biomechanical comparison of gait in prospective randomized trial of pCL-retaining ... 199 <i>Olney, Zee</i> Gait changes from spinal surgery in adolescents with idiopathic scoliosis. 200 <i>Engsberg, Lenke</i>
15:45 - 17:00	Clinical Biomechanics 2 (Chair: Olney, Engsberg) The long-term effects of the multilevel surgical approach in children with cerebral ... 220 <i>Ounpuu, DeLuca</i> The effect of the use of an orthosis on paretic muscle function. 221 <i>Geboers, Seelen</i> AFO influences on gait patterns resulting from induced peroneal nerve palsy. 222 <i>Harvey, Hamill</i> Design of a knee and ankle flexing orthosis for paraplegic ambulation. 223 <i>Greene, Granat</i> Do rocker soles reduce plantar pressure in persons at risk for diabetic neuropathic ... 224 <i>Stacpoole-Shea, Shea</i>

Wednesday August 11

Main Lecture Hall

08:00 - 08:30	Invited Lecture (Chair: Snyder-Mackler) The effect of physical stimuli on connective tissues: Implications for repair and ... 26 <i>Arnoczky</i>
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11:45 - 12:30	Muybridge Lecture (Chair: Rau) Stretch-shortening cycle: A powerful model to study normal and fatigued muscle. 5 <i>Komi</i>

Lecture Hall A

08:00 - 08:30	Invited Lecture (Chair: Milani) Spinal/brainstem control of walking in humans as seen in human infants. 27 <i>Yang</i>
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10:15 - 11:30	Locomotion 4 (Chair: Caldwell, Gregor) Biomechanics of backward walking. 254 <i>Tolani, Kram</i> The effect of shoe heel height on walking patterns of females. 255 <i>Schollhorn, Stefanyshyn</i> Ankle motion during walking in subjects with normal, low and high arched feet. 256 <i>Rattanaprasert, Smith</i> Comparison of lower extremity joint kinetics during downhill walking with ... 257 <i>Schwameder, Roithner</i> Arch stiffness and torsion of the foot in barefoot locomotion. 513 <i>Miller, Nigg</i>

Wednesday August 11

Lecture Hall B

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08:30 - 09:45	Energy and Performance Symp. (Ch.: de Koning, Brüggemann) Influence of midsole bending stiffness on joint energy and jump height performance. 236 <i>Stefanyshyn, Nigg</i> Can athletic performance be enhanced by sport surfaces and sport shoes?. 237 <i>Baroud, Nigg</i> Assessing the individual economy in cross-country skiing. 238 <i>Minetti, Susta</i> The effect of muscular work on the utilization of high bar and uneven parallel bars ... 239 <i>Arampatzis, Brüggemann</i> Discussion
10:15 - 11:30	Sport 4 (Chair: Fukashiro, Baroud) Sprint kinematics of the world's fastest human. 260 <i>Kivi</i> Kinematic characteristics of transtibial and transfemoral male amputee 100m sprinters. 261 <i>Ciapponi, Simpson</i> Lower limb joint mechanics with increasing running speed. 262 <i>Kyrolainen, Belli</i> A biomechanical approach to cross-training influences on running economy and ... 263 <i>Hottenrott, Hoos</i> Kinematic and kinetic assessment of the triathlon running phase: The effect of ... 264 <i>Soper, Hume</i>

Lecture Hall C

08:00 - 08:30	Invited Lecture (Chair: Herzog) Mechanisms contributing to the age-related decline in steadiness of submaximal ... 229 <i>Enoka</i>
08:30 - 09:45	Muscle Symposium 2 (Chair: Farley, Thomas) Motor unit rates during voluntary contractions. 242 <i>Thomas, Kozhina</i> Excitability of the corticospinal pathway during isometric, concentric and ... 243 <i>Sekiguchi, Kimura</i> Changes in motor units activation patterns and contractile properties during ... 244 <i>Duchateau, Carpentier</i> P- and C- variability during maximal isometric force production in a multi-finger task. 245 <i>Zatsiorsky, Gregory</i> Age and training related influences on motor unit control properties. 246 <i>Patten</i>
10:15 - 11:30	Muscle Symposium 2 (continued) (Chair: Farley, Thomas) The control of muscles during virtual movements. 266 <i>Buchanan, Cheng</i> Mechanisms for controlling leg stiffness during locomotion. 267 <i>Farley, Aagaard</i> Neuromuscular activation during maximal eccentric and concentric quadriceps ... 268 <i>Aagaard, Simonsen</i> Agonist and antagonist activation during lengthening and shortening plantar flexor ... 269 <i>Cresswell, Pinniger</i> Interaction between joint kinematics and stiffness regulation during exhausting ... 270 <i>Horita, Komi</i>
12:30 - 14:00	ISB General Assembly

Thursday August 12

Main Lecture Hall

08:00 - 08:30	Invited Lecture (Chair: Frank) The application of robotics technology to joints biomechanics research. 30 <i>Woo</i>
08:30 - 09:45	Ligament Symposium (Chair: Woo, Frank) Biomechanical studies of the optimisation and evaluation of anterior cruciate ... 272 <i>Amis, Bull</i> Gene therapy for ligament healing. 273 <i>Frank, Hart</i> Gap junction-dependent and independent Ca²⁺ signaling: Roles in downstream ... 274 <i>Banes, Francke</i> Measurement of anterior cruciate ligament strain during non-weight and weight ... 275 <i>Beynon, Fleming</i> Structural mechanics of creep in ligaments. <i>Shrive</i>
10:15 - 11:30	Orthopedics 5 (Chair: Watanabe, Vaughan) Adaptations of gait on the contralateral limb in children with spastic hemiplegia. 296 <i>Sawatzky, Beauchamp</i> Pattern symmetry in transtibial amputee walking: Towards a theoretical ... 297 <i>Bach</i> In vivo knee muscle and joint forces before and after rehabilitation for ACL injury and ... 298 <i>DeVita, Hortobagyi</i> Pattern of stair ambulation in highly functional individuals after total knee ... 299 <i>Kramers-de Quervain</i> The immediate effects of enforcing the resonant frequency of a modified FDHO ... 300 <i>Decker, Torry</i>
11:45 - 12:30	Keynote Lecture (Chair: Mueller) A progress report on the prevention of age-related fractures. 6 <i>Hayes</i>
13:30 - 14:00	Clinical Biomechanics Award - Winner (Chair: Norman) Intra-articular knee joint effusion induces quadriceps avoidance gait patterns. 11 <i>Torry</i>
14:00 - 15:15	Clinical Biomechanics Award - Finalists (Chair: Norman) Botulinum toxin A in the treatment of spastic equinus Clinical, electromyographic and ... 321 <i>Rosenbaum, Senst</i> Anisotropic fabric changes of periarticular cancellous bone in a canine model of ... 322 <i>Boyd, Muller</i> Muscle response and whiplash injury biomechanics. 323 <i>Brault, Siegmund</i> The optimal wave pattern for mechanical stimulation of human osteoblast ... 324 <i>Rosenberg, Francis</i> Discussion
15:45 - 17:00	Clinical Biomechanics 4 (Chair: Suter, Gal) Changes in muscle work of gait in response to training of subjects with hemiparesis ... 348 <i>Olney, Teixeira-Salmela</i> A new feedback controlled functional electrical stimulation for the restoration ... 349 <i>Chang, Chen</i> Biomechanics of standing-up with constraints and assistive devices: A study oriented ... 350 <i>Frigo, Pavan</i> Optimization of cycling by means of functional electrical stimulation. 351 <i>Gfoehler, Angeli</i> Contribution of each joint to the lower limb work in gait of healthy and stroke subjects. 352 <i>Nadeau, Teixeira-Salmela</i>

Lecture Hall A

08:00 - 08:30	Invited Lecture (Chair: Stefanyshyn) The link between mechanics and energetics of locomotion. 31 <i>Minetti</i>
08:30 - 09:45	Vertical Jumping (Chair: van den Bogert, Bobbert) Does low surface friction improve vertical jumping as a model for the push off in ... 278 <i>Houdijk, Bobbert</i> Criteria of optimizing during multi vertical jumping. 279 <i>Mastalerz, Fidelus</i> Enhanced muscle power production during countermovement jump in elderly ... 280 <i>Caseroiti, Puggaard</i> The biomechanics of jumping exercises in simulated and true microgravity. 281 <i>Davis, D'Andrea</i> The influence of net joint forces on vertical jumping. 282 <i>Munkasy, McNitt-Gray</i>
10:15 - 11:30	Injury Biomechanics (Chair: Wood, Lloyd) The relationship between foot morphology and musculoskeletal overuse injuries. 302 <i>Kaufman, Brodine</i> The effect of the inverted orthotic on lower extremity mechanics. 303 <i>McClay, Williams</i> The effect of gait asymmetries on running injuries. 304 <i>Hreljac, Marshall</i> Increased loading of the knee during side-stepping and cross-over cutting ... 305 <i>Lloyd, Cochrane</i> Knee joint loading and patellofemoral pain syndrome in runners: A prospective ... 306 <i>Stergiou, Stefanyshyn</i>
12:45 - 13:30	Brown Bag Lunch. Forum on Forensic Biomechanics (Chair: Nelson) The role of the biomechanist in personal injury and product liability litigation. <i>Brault, Siegmund</i>
14:00 - 15:15	Movement and Posture 2 (Chair: Cresswell, Voigt) The human soleus stretch reflex during pedalling. 326 <i>Grey, Pierce</i> Difference of the soleus H-reflex and motor evoked potential during standing and ... 327 <i>Yamanaka, Sekiguchi</i> Differences in H reflex modulation relate to walking mechanics. 328 <i>Simonsen, Dyhre-Poulsen</i> Excitability of stretch reflex pathway during isometric, concentric and eccentric ... 329 <i>Kimura, Sekiguchi</i> From hand to foot and foot to hand: Widespread interlimb distribution of ... 330 <i>Zehr, Collins</i>
15:45 - 17:00	Modeling and Simulation 1 (Chair: Pandey, Wright) Three-dimensional segment interactions in a three-segment model. 354 <i>Burko, Neal</i> A flexible system for real-time, interactive, 3D musculoskeletal modeling. 355 <i>Buford, Andersen</i> Identification of the human body's inertial parameters: Theory and simulation of ... 356 <i>Chenut, Samin</i> Quantification of the effects of the angle of tibial malrotation on ground reaction ... 575 <i>Scovill, Wright</i> 3D Attitude representation of the whole human body in motion. 358 <i>Mercadante, Brenzikofer</i>

Thursday August 12

Lecture Hall B

08:00 - 08:30	Invited Lecture (Chair: Cole) Biological response to vibration load. 32 <i>Mester</i>
08:30 - 09:45	Vibration Load Symposium (Chair: Mester, Cole) A dynamic system model of an off-road bicycle and cyclist. 284 <i>Wang, Hull</i> Muscle stiffness response during landing onto various surfaces with various ... 285 <i>Brüggemann, Arampatzis</i> Shock attenuation and transmission during running. 286 <i>Hamill, Derrick</i> Effects of vibration of muscle energy turnover. 287 <i>Hoffmann, Leyk</i> Contribution of vibration-induced alterations of neurosensory mechanisms to tissue ... 288 <i>Martin, Armstrong</i>
10:15 - 11:30	Sport 5 (Chair: Fregly, Motoshi) Which factors determine the optimal pedaling rate in sprint cycling? 308 <i>van Soest, Casius</i> The relationship between leg kinematics and pedal reaction force during human ... 309 <i>Suzuki, Ohta</i> Crank torque during cycling at different crank inertial loads. 310 <i>Hansen, Sjogaard</i> The effect of pedal crankarm length on joint angle and cycling duration in upright ... 311 <i>Too, Landwer</i> The association between negative muscle work and preferred pedaling rates. 312 <i>Neptune, Herzog</i>
14:00 - 15:15	Soft Tissue Mechanics 1 (Chair: Shrive, Duncan) Wrist joint ligament length changes Effect of scapho-lunate instability simulation. 332 <i>Feipel, Salvia</i> Experimental measurement of strain concentration on the ligament insertion. 333 <i>Yamamoto, Hirokawa</i> Theoretical analysis of strain concentration on the ligaments insertions. 334 <i>Hirokawa, Yamamoto</i> Prediction of load transfer in cartilage indentation using FE biphasic analysis. 335 <i>Warner, Taylor</i> Relationship between indentation properties and composition of human articular ... 336 <i>Hasler, Franz</i>
15:45 - 17:00	Soft Tissue Mechanics 2 (Chair: Miller, Hirokawa) Effects of in vitro fluoride treatment on the dynamic mechanical properties of ... 360 <i>McCurdy Rahn, Hogan</i> Classification of microdamage in human cortical bone via acoustic emission. 361 <i>Akkus, Rimnac</i> High-resolution 3D pQCT is adequate to analyse the mechanical properties of ... 362 <i>Pistoia, van Rietbergen</i> Changes in femoral neck bone mineral density and mechanical properties ... 363 <i>Wohl, Spaeth</i> Biomechanical analysis for estimating intrinsic properties of cancellous bone in ... 364 <i>Groves, Hogan</i>

Lecture Hall C

08:00 - 08:30	Invited Lecture (Chair: Duncan) Three-dimensional evaluation of treatment in adolescent idiopathic scoliosis. 33 <i>Dansereau</i>
08:30 - 09:45	Scoliosis Symposium (Chair: Dansereau, Duncan) Clinical significance of back shape measurements. 290 <i>Raso</i> Mechanical modeling of scoliosis deformities. 291 <i>Skalli, Leborgne</i> Intra-operative measurements and computer assisted surgery. 292 <i>Aubin, Dansereau</i> Biomechanics of spinal deformity progression. 293 <i>Stokes</i> Moving beyond static biomechanics for the etiology of adolescent idiopathic scoliosis. 294 <i>Bagnall</i>
10:15 - 11:30	Spine 1 (Chair: Cholewicki, Kawchuk) Theory of small vertebral motions: An analytical model compared to data. 314 <i>Solinger</i> Mathematical model of the lumbar spine loads. 315 <i>Janda, Valenta</i> In vivo quantification of the scoliotic vertebral body mechanical properties. 316 <i>Perie, Hobatho</i> Numerical approaches to the biomechanics of spinal motion segment. 317 <i>Meroi, Natali</i> Estimation of spinal loads. 318 <i>Pomero, Lavaste</i>
14:00 - 15:15	Young Investigator Podium Award - Finalists (Ch.: Blankevoort) An in-vitro measurement system for the analysis of scapulo-humeral stability. 338 <i>Roth, Cavus</i> Chondrocyte deformation resulting from in-situ static compression of articular ... 339 <i>Clark, Herzog</i> Quantification of maximal fingertip force in cadaver-simulated peripheral nerve injuries. 340 <i>Valero-Cuevas, Towles</i> A reliability assessment of two inverse dynamics techniques. 341 <i>Nagano, Gerritsen</i> A comparison of 3d in vivo kinematics in the unimpaired & ACL-deficient knee. 342 <i>Sheehan, Rebmann</i>
15:45 - 17:00	Young Investigator Podium Award - Finalists (Ch.: Blankevoort) Contributions to reducing peak shoulder forces during longswings on rings. 343 <i>Brewin, Yeadon</i> Intervertebral disc hydration modulates the injury process. 344 <i>Gunning, McGill</i> Structural changes during isometric contractions of the cat medial gastrocnemius. 345 <i>Carvalho, Leonard</i> Human metatarsal deformation measured in vivo during barefoot treadmill walking. 346 <i>Arndt, Westblad</i> Discussion

Friday August 13

Main Lecture Hall	
08:00 - 08:30	Invited Lecture (Chair: Herzog) Observations of in vivo human muscle behavior reveal considerable interaction ... 34 <i>Kawakami</i>
08:30 - 09:45	Muscle Symposium 3 (Chair: Kawakami, Lieber) Rupturing of intramuscular connective tissue and myofascial force transmission after ... 366 <i>Jaspers, Brunner</i> Hindlimb kinetics during a complete step cycle walking upslope, downslope and ... 367 <i>Gregor, Smith</i> Sarcomere number addition in the rabbit hindlimb after tendon transfer depends ... 368 <i>Friden, Ponten</i> The functional capacity of elbow muscles. 369 <i>Delp, Murray</i> Non-invasive, mechanical measurement of fibre-type composition in human muscle. 370 <i>Hoffer, Thorstensson</i>
10:15 - 11:30	Muscle 2 (Chair: Rassier, Lieber) Modelling history-dependent behaviour of muscle during concentric contraction. 390 <i>Wu, Herzog</i> Force enhancement after stretch during contraction of skeletal muscle fibres: ... 391 <i>de Vlugt, Rozendaal</i> Prediction of antagonist muscle moments during dynamic isokinetic knee extension ... 392 <i>Baltzopoulos, Kellis</i> Muscle coordination using a non-linear optimization approach: A theoretical study. 393 <i>Ait-Haddou, Herzog</i> A computational approach for simulating muscle morphologic changes for use in ... 394 <i>Hawkins, Barr</i>
11:45 - 12:30	Keynote Lecture (Chair: Yeadon) From biomechanical theory to application in top sports: The klapskate story. 7 <i>de Koning</i>
13:30 - 14:00	Novel Award Winner (Chair: Siegler) Effects of diabetic-induced soft tissue changes on stress distribution in the ... 12 <i>Thompson</i>
14:00 - 15:15	Novel Award Finalists (Chair: Siegler) Contact forces in the ankle joint complex using an EMG-assisted optimization ... 415 <i>Jenkyn, Nicol</i> A multi-segment foot model protocol for research and clinical applications. 417 <i>Carson, Harrington</i> Electrocutaneous biofeedback of pressure distribution under the feet facilitates ... 418 <i>Jensen, Matjacic</i> The effect of posterior tibial tendon rupture on hindfoot kinematics. 419 <i>Ching, Niki</i> Discussion
15:45 - 16:30	President's Lecture (Chair: Cavanagh) Movement biomechanics goes upwards: From the leg to the arm. 8 <i>Rau</i>
16:30 - 17:00	Closing Ceremony

Lecture Hall A	
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08:30 - 09:45	Aquatic Sports Symposium (Chair: Hinrichs, van den Bogert) Effects of the improved metabolic capacity and propelling efficiency on swimming ... 372 <i>Ogita</i> Changes in the stroke dynamical parameters of swimmers after using ... 373 <i>Kleshnev, Petriaev</i> Comparative study of the efficiency of two types of scull blades in rowing. 374 <i>Toigo, Beatrice</i> Muscle mechanics vary along the body during fast-starts in the common carp ... 375 <i>Wakeling</i> Mechanics and energetics of swimming by animals. 376 <i>Alexander</i>
10:15 - 11:30	Sport 6 (Chair: Wakeling, Dapena) Hydrodynamic characteristics of the human hand model. 396 <i>Takagi, Kudo</i> Contribution of rotations of the trunk and upper extremity to hand speed during ... 397 <i>Payton, Baltzopoulos</i> The effects of specific gravity of water on posture and passive drag during prone ... 398 <i>Matsui, Miyachi</i> A new approach of modeling performance in butterfly swimming. 399 <i>Taiar, Sagnes</i> An analysis of velocity and time characteristics of three starts in competitive ... 400 <i>Welcher, Hinrichs</i>
14:00 - 15:15	Movement and Posture 3 (Chair: Patla, McFadyen) Lateral stability and energy costs in passive dynamic walking. 422 <i>Kuo, Bauby</i> Biomechanical and spectral analysis of human movement. 423 <i>Tsuruoka, Shibasaki</i> Training effects on body balance. 424 <i>Bochdansky, Ebenbichler</i> Precision of self-rotation estimate by isolated vestibular input of different sports groups. 425 <i>Stangl, Haslwanter</i> The disturbance threshold of a trip depends on strength and reaction time. 426 <i>Smeesters, Hayes</i>

Friday August 13

Lecture Hall B

08:00 - 08:30	Invited Lecture (Chair: Shrive) Diarthrodial joints: Kinematic pairs, mechanisms or flexible structures? 36 <i>O'Connor</i>
08:30 - 09:45	Joint Symposium (Chair: Shrive, O'Connor) Knee arthroplasty mechanics during gait using simultaneous fluoroscopy and ... 378 <i>Banks, Otis</i> Dynamic instability of canine knees after ACL transection. 379 <i>Tashman, Anderst</i> Collar-liner hooking as a serendipitous dislocation check in revision total hip ... 380 <i>Scifert, Brown</i> A dynamic optimization solution for one complete cycle of human gait. 381 <i>Anderson, Pandey</i> Articular contact and fibre recruitment at the human ankle joint. 382 <i>Leardini, Catani</i>
10:15 - 11:30	Knee (Chair: Mohtadi, Pincivero) The biomechanics of functional knee braces on the anterior cruciate ligament deficient ... 402 <i>Beynon, Brown</i> Optimization of ligament slack lengths for a 3D model of the human knee. 403 <i>Erdemir, Turner</i> Measuring knee joint kinematics and geometry using a magnetic tracking device ... 404 <i>Brugger, Schmiedmayer</i> Effects of variation of femoral groove geometry in patellar stability. 405 <i>Farahmand, Shahabi</i> Patellar kinematics and muscular moment arms after anterior tibial tuberosity ... 406 <i>Salvia, Ransbotyn</i>
14:00 - 15:15	Modeling and Simulation 2 (Chair: Cole, Scovil) Direct comparison of static and dynamic optimization solutions for gait. 428 <i>Anderson, Pandey</i> Dynamic simulation of three-dimensional running motion. 429 <i>Hase</i> Simulation of bipedal walking using quadratic dynamic matrix control (QDMC). 431 <i>Koopman, van der Kooij</i> Incorporating pulse-based muscle activation into a physiologically based computer ... 432 <i>Mullany, O'Malley</i> Discussion

Lecture Hall C

08:00 - 08:30	Invited Lecture (Chair: Duncan) Challenging biomechanical spine models to enhance healthy backs. 37 <i>McGill</i>
08:30 - 09:45	Spine Symposium (Chair: McGill, Duncan) Sharing the forces between the muscles of the back: Why the spine does not collapse. 384 <i>Stokes</i> Muscle activation in the lumbar spine stability models - Guidelines for a ... 385 <i>Cholewicki</i> Effect of spine posture and load configuration on passive-active load sharing and tissue ... 386 <i>Shirazi-Adl, Parnianpour</i> The influence of tissue stress on cell activity within the intervertebral disc. 387 <i>Lotz</i> Discussion
10:15 - 11:30	Spine 2 (Chair: Frazer, Stokes) Effects of trunk loads on lumbar spine stability. 408 <i>Cholewicki, Simons</i> Estimation of gradual water loss in a loaded intervertebral disc using finite ... 409 <i>Kingma, van Dieen</i> Spine mechanical response to static axial compression load: An MRI study in vivo. 410 <i>Wisleder, Smith</i> Intradiscal pressure in the degenerated porcine spine. 411 <i>Holm, Ekstrom</i> Frequency profile and fatigue in trunk muscles in rotation. 897 <i>Kumar, Narayan</i>
14:00 - 15:15	Locomotion 5 (Chair: Sutherland, Rosenbaum) Shock attenuation during running at different stride lengths and frequencies. 434 <i>Mercer, DeVita</i> Differences in initial kinematic conditions between shod and barefoot running. 435 <i>De Clercq, de Wit</i> Internal loading of the lower extremity during running obtained by two different ... 436 <i>Kersting, Bohm</i> Influence of fatigue on plantar loading and cadence of recreational runners. 437 <i>Kernozek, Willson</i> Shock attenuation during downhill running. 438 <i>Chu, Peters</i>