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Journal of Biomechanical Engineering

Editorial

2014 World Congress of Biomechanics Student Paper Competition

Introduction

The Bioengineering Division sponsored a Student Paper Competition at the seventh World Congress of Biomechanics. There are three competition levels: Ph.D., M.S., and B.S. The competition is divided into multiple technical areas to provide for a fair evaluation of student work. There are also cash awards for the top three student papers in each area. We are pleased to recognize the following awardees from the 2014 competition.

B.S. Competition Winners

Fluid Mechanics, Biotransport, Cellular and Tissue Engineering.

First Place: **Samir Sarda**, Children's Healthcare of Atlanta, "A Quantitative Analysis of Cerebrospinal Fluid (CSF) Flow in Pediatrics With Type 1 Chiari Malformation."

Second Place: **Jessica Ngai**, Harvard Medical School, "Mesenchymal Stem Cells as a Trojan Horse Therapy for Prostate Cancer."

Third Place: **Michael Majcher**, University of Akron, "Quantification of Neural Tissue Deformation in Type 1 Chiari Malformation Patients Pre- and Postspinal Decompression Surgery and Comparison to Controls."

Solid Mechanics and Materials, Design Dynamics, Rehabilitation.

First Place: **Sarah Denning**, Bucknell University, "Utilization of Peak Extraction Force of Kirschner (K-) Wire as a Predictor of Bone Mineral Density (BMD)."

Second Place: **Jared Zitnay**, University of Minnesota, "Multiscale Modeling of the Cervical Facet Capsular Ligament During Tensile Joint Loading."

Third Place: **Cole Simpson**, Georgia Institute of Technology, "Feasible Ranges of Muscle Activation Quantify Musculoskeletal Redundancy in Human Walking."

M.S. Competition Winners

Biofluids, Biotransport, and Design Engineering.

First Place: **Hiroyuki Uwamori**, Keio University, Japan, "Effect of Unidirectional VEGF Supply on the Formation of Capillary Networks With Pericytes in a Microfluidic Device."

Second Place: **Joshua Hughey**, Marquette University, "Impact of Stent Platform on Wall Shear Stress Distributions After Implantation: Insights From Computational Fluid Dynamics Simulations Using Optical Coherence Tomography and Coronary CT Angiography."

Third Place: **Swarup Zachariah**, University of Cincinnati, "Prediction of Core Body Temperature Sweat Rate Cardiac Output and Stroke Volume for Firefighters Using a 3D Whole Body Model."

Solid Mechanics and Rehabilitation.

First Place: **Dilaver Singh**, University of Waterloo, Canada, "Head FE Models to Evaluate Primary Response to Blast Loading and Protection."

Second Place: **Sarai Mizrachi**, University of the Negev, Israel, "Prediction Equations for Leg Kinematics and Kinetics During Slope Walking and Running."

Third Place: **Yaejin Moon**, University of Illinois at Champaign, "Variability Structure in Hand-Rim Peak Force During Manual Wheelchair Propulsion: A Pilot Study."

Tissue and Cellular Engineering.

First Place: **Chantal de Bakker**, University of Pennsylvania, "Maternal Bone Regains Mechanical Competence after Lactation by Increasing the Thickness and Altering the Structure Type of the Remaining Trabeculae."

Second Place: **Benjamin Freedman**, University of Pennsylvania, "Novel Application Of A Micro-CT Perfusion Technique to Evaluate Achilles Tendon Vessel Microarchitecture in Three Dimensions."

Third Place: **Matt Walker**, Dalhousie University, Canada, "Micromechanical Stimulation of 3D Tissue-Engineered Microtissues Using a Piezoelectric Actuated Cantilevers."

Ph.D. Competition Winners

Cartilage and Menisci.

First Place: **Jennifer L. Puetzer**, Cornell University, "Development of Tissue Engineered Menisci With Physiologically Distributed Loading."

Second Place: **Kirk J. Samaroo**, Cornell University, "Prevention of Cartilage Degeneration by Intraarticular Treatment With Lubricin-Mimetics in the Rat Following Anterior Cruciate Ligament Transection."

Third Place: **Eni Halilaj**, Rhode Island Hospital & Brown University, "Thumb Carpometacarpal (CMC) Joint Stability Is Not Compromised in Early OA."

Cardiovascular.

First Place: **Rachel M. Buchanan**, The University of Texas at Austin, "In Situ Estimation of Aortic Valve Interstitial Cell Mechanical State From Tissue Level Measurements."

Second Place: **Qian Wang**, Georgia Institute of Technology, "Patient-Specific CT Image-Based Engineering Analysis of Transcatheter Aortic Valve Replacement."

Third Place: **Nicole A. Varble**, University at Buffalo, The State University of New York, "Intracranial Aneurysm Rupture

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Stratification Based on Flow Stability Analysis of High Resolution CFD."

Cellular Mechanics.

First Place: **Mary Sewell-Loftin**, Vanderbilt University, "Mechanoregulation of Epithelial to Mesenchymal Transformation in Endocardial Cells."

Second Place: **Noel H. Reynolds**, National University of Ireland, Galway, "Investigation of the Biomechanical Behavior of Stress Fibers and Nucleus Deformation in Spread Cells Using a Novel Micropipette Aspiration Technique."

Third Place: **Zaw Win**, University of Minnesota, "Initial Cell Seeding Conditions Influence Engineered Tissue Contractility."

Human Locomotion.

First Place: **David Howell**, University of Oregon, "Return to Physical Activity Following Concussion Affects Recovery in Frontal Plane Balance Control During Dual-Task Walking."

Second Place: **Sjoerd Kolk**, Radboud University Medical Center, "Determination of Muscular Activity in the Lower Limb During Walking Using FDG-PET."

Third Place: **Robert A. Weinert-Aplin**, Imperial College, London, "Biomechanics of the Eccentric Heel-Drop Exercise."

Image-Based Measurements.

First Place: **Xuefeng Chen**, Stanford University, "Changes in Sarcomere Lengths of the Human Vastus Lateralis With Knee Flexion Measured With in vivo Microendoscopy."

Second Place: **Guillaume Dubois**, Arts et Metiers Paris Tech, "A Reliable Protocol for Shearwave Elastography of Lower Limb Muscles at Rest and Stretched."

Third Place: **Charlie Demene**, Arts et Metiers Paris Tech, "Ultrasound Ultrafast Imaging: Application to the 2D Mapping of Cerebral Vascular Resistivity and Tissue Elasticity in the Preterm Infant Brain."

Orthopaedics.

First Place: **Kathryn F. Farraro**, University of Pittsburgh, "A Novel Magnesium Ring for Repair of an Injured Anterior Cruciate Ligament—in vitro and in vivo Studies in Goats."

Second Place: **Andreas J. Trüssel**, Institute for Biomechanics, ETH Zurich, "Multiplex Osteocyte Gene Expression in an in vivo Model of Mechanical Bone Adaptation."

Third Place: **Zach F. Lerner**, Colorado State University, "Modeling Subject-Specific Lower-Extremity Alignment Improves Medial-Lateral Knee Joint Contact Force Predictions During Gait."

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