43rd International Workshop on Human Subjects for Biomechanical Research

National Highway Traffic Safety Administration — **Rodney W. Rudd, Chair**

New Orleans Downtown Marriott Hotel – New Orleans, LA — Sunday, November 8, 2015

PROGRAM

7:30-9:00 **REGISTRATION**

9:00-10:20 **SESSION I**

Biofidelity of Dummies in Rollover Crash Impacts
Jacek Toczyski, Q. Zhang, D. Lessley, J. Kerrigan
University of Virginia Center for Applied Biomechanics

Head, Neck, Chest, and Lumbar Responses During Compact SUV Rollovers
Tim S. Nelson[1], J. C. Gardiner[1], D. D. Chimich[1], G. P. Siegmund[1,2]
[1] MEA Forensic Engineers and Scientists, [2] School of Kinesiology – University of British Columbia

Assessing Rollover Crashworthiness in Dynamic vs. Static Testing
Jason R. Kerrigan, C. Roberts, J. Toczyski, J. Cochran, Q. Zhang
University of Virginia Center for Applied Biomechanics

Biofidelity Evaluation of the THOR-Metric Neck under Multiple Modes of Loading: Torsion, Lateral and Anterior-Posterior Bending, and Combined Tension-Bending
Jason F. Luck, H. C. Cutcliffe, J. R. Kait, R. W. Nightingale, K. P. Shah, C. R. Bass
Department of Biomedical Engineering – Duke University

10:20-10:40 **BREAK**

10:40-12:00 **SESSION II**

A New Acoustic Burst-based Method to Detect Fracture in Human Long Bone and Vertebra
Brian D. Goodwin, N. Yoganandan, F. A. Pintar
Medical College of Wisconsin

Development of a Twelve-channel "Intelligent Mouthguard" Single Event Head Impact Dosimeter
A. Bartsch, Sergey Samorezov
Cleveland Clinic

Measurement of Head Kinematics in Impact Conditions Using a Coplanar 6aω Configuration
Yun-Seok Kang[1], S. Goldman[1], K. Moorhouse[2], J. H. Bolte[1]
[1] Injury Biomechanics Research Center at The Ohio State University, [2] National Highway Traffic Safety Administration

High-frequency Ultrasound for the Measurement of Intracranial Motion in Head Rotation
Ann Mallory[1], Y. Kang[2], R. Herriott[1], H. Rhule[3], B. Donnelly, K. Moorhouse[3]
[1] Transportation Research Center Inc., [2] Ohio State University Medical Center, [3] National Highway Traffic Safety Administration

12:00-1:30 **LUNCH**

1:30-2:50 **SESSION III**

Concept Design of THOR 5th Female ATD

Jerry Wang, J. McInnis, T. Nghi, D. Isopi, M. Miles
Humanetics Innovative Solutions, Inc.

Development of an Advanced High-Fidelity Finite Element Model of THOR-M 50th Frontal Impact Dummy

Fuchun Zhu, Z. Zhou, S. Fu
Humanetics Innovative Solutions, Inc.

Development and Validation of Subject-specific Human Body Models Representing Occupants with Different Obesity Levels

Yulong Wang[1,2], Z. Bai[1], L. Cao[1], M. P. Reed[2], J. Forman[3], J. Hu[2]
[1] State Key Laboratory of Advanced Design and Manufacturing for Vehicle Body – Hunan University, [2] University of Michigan Transportation Research Institute, [3] University of Virginia Center for Applied Biomechanics

An Objective Evaluation of Mass Scaling Techniques Utilizing Computational Human Body Models

Matthew Davis, F. S. Gayzik
Wake Forest School of Medicine and Virginia Tech – Wake Forest Center for Injury Biomechanics

2:50-3:10 **BREAK**

3:10-4:30 **SESSION IV**

Development and Optimization of Simplified Finite Element Reconstructions of Frontal Motor Vehicle Crashes

M. E. Kelley, J. P. Gaewsky, D. A. Jones, L. E. Miller, B. Koya, A. A. Weaver, J. D. Stitzel
Virginia Tech – Wake Forest Center for Injury Biomechanics

Preliminary Investigation of Thoracolumbar Loads under Frontal Crashes using a Human Finite Element Model

Mike W. J. Arun, N. Yoganandan, J. R. Humm, F. A. Pintar
Medical College of Wisconsin

Effect of Impact Location on Brain Tissue Strain in Football Helmet Impacts

Benjamin S. Elkin[1], L. F. Gabler[2], M. B. Panzer[2], G. P. Siegmund[1,3]
[1] MEA Forensic Engineers and Scientists, [2] University of Virginia Center for Applied Biomechanics, [3] School of Kinesiology – University of British Columbia

Understanding Head Injury Mechanisms: Parametric Modeling of Head/Neck Response

Derek A. Jones, J. E. Urban, C. G. Costa, A. A. Weaver, J. D. Stitzel
Wake Forest School of Medicine and Virginia Tech – Wake Forest Center for Injury Biomechanics

4:30-4:40 **CONCLUDING REMARKS**