

9:00 WELCOME AND OPENING REMARKS – General Chair, Annette Irwin, General Motors

PEDIATRIC BIOMECHANICS IN FRONTAL AND REAR IMPACTS

Co-Chairs: Saeed Barbat, Ford Motor Company
Warren N. Hardy, Virginia Tech

9:15 Analysis of Kinematic Response of Pediatric Occupants Seated in Naturalistic Positions in Simulated Frontal Small Offset Impacts: With and Without Automatic Emergency Braking
J. Maheshwari, S. Sarfare, Center for Injury Research and Prevention, Children's Hospital of Philadelphia; C. Falciani, Center for Injury Research and Prevention, Children's Hospital of Philadelphia /School of Computing and Informatics, Drexel University; A. Belwadi, Center for Injury Research and Prevention, Children's Hospital of Philadelphia

9:45 Evaluation of Rotation Reduction Features in Infant and Extended-Use Convertible Child Restraint Systems during Frontal and Rear Impacts
Declan A. Patton, Aditya N. Belwadi, Jalaj Maheshwari, Center for Injury Research and Prevention, Children's Hospital of Philadelphia; Kristy B. Arbogast, Center for Injury Research and Prevention, Children's Hospital of Philadelphia/Perelman School of Medicine, University of Pennsylvania

10:15 – 10:45 REFRESHMENT BREAK

ADVANCES IN INJURY PREDICTION AND SAFETY

10:45 Instantaneous Brain Strain Estimation for Automotive Head Impacts via Deep Learning
Shaoju Wu, Wei Zhao, Department of Biomedical Engineering, Worcester Polytechnic Institute, Worcester, MA; Saeed Barbat, The Ford Company; Jesse Ruan, Tianjin University of Science and Technology, China; Songbai Ji, Department of Biomedical Engineering, Worcester Polytechnic Institute

11:15 Lives Saved by Accelerating the Implementation of Vehicle Safety Technology in New South Wales
Johan Strandroth, Strandroth Inc, Lösningar Pty Ltd; Ralston Fernandes, Greer Banyer, Antonietta Cavallo, Transport for New South Wales, Centre for Road Safety

11:45 Occupant-Based Injury Severity Prediction
Susan H. Owen, Jeffrey W. Joyner, Global Product Safety & Systems, General Motors; Peng Zhang, Stewart C. Wang, University of Michigan International Center for Automotive Medicine

12:15 – 2:00 LUNCH

EFFECTS OF RECLINED POSTURE ON OCCUPANT INJURIES AND KINEMATICS IN FRONTAL IMPACTS

Co-Chairs: Priya Prasad, Prasad Engineering
Frank A. Pintar, Medical College of Wisconsin

2:00 Investigation of Potential Injury Patterns and Occupant Kinematics in Frontal Impact with PMHS in Reclined Posture
Pascal Baudrit, Jérôme Uriot, CEESAR (Nanterre – France); Olivier Richard, Matthieu Debray, Faurecia Automotive Seating (France)

2:30 Obese Occupant Response in Reclined and Upright Seated Postures in Frontal Impacts
Karthik Somasundaram, John R. Humm, Narayan Yoganandan, Hans Hauschild, Klaus Driesslein Frank A. Pintar, Medical College of Wisconsin and VA Medical Center, Milwaukee, WI

3:00 Kinematic and Injury Response of Reclined PMHS in Frontal Impacts
Rachel Richardson, John-Paul Donlon, Mohan Jayathirtha, Jason L. Forman, Greg Shaw, Bronislaw Gepner, Jason R. Kerrigan, University of Virginia Center for Applied Biomechanics; Martin Östling, Krystoffer Mroz, Bengt Pipkorn, Autoliv Development AB

3:30 – 4:00 REFRESHMENT BREAK

ANALYSIS OF LAP BELT FIT AND LATERAL IMPACT TO FLEXED KNEES

- 4:00 Analysis of Lap Belt Fit to Human Subjects using CT Images**
Yoshihiko Tanaka, Atsushi Nakashima, Haijie Feng, Koji Mizuno, Nagoya University; Minoru Yamada, Yoshitake Yamada, Yoichi Yokoyama, Masahito Jinzaki, Keio University School of Medicine
- 4:30 Ligaments Laxity and Elongation at Injury in Flexed Knees during Lateral Impact Conditions**
Sahar Benadi, LAB Stellantis Renault (Nanterre – France)/Univ Lyon, Univ Gustave Eiffel, Univ Claude Bernard Lyon 1, LBMC UMR T_9406, F-69622 Lyon, France; Xavier Trosseille, Philippe Petit, LAB Stellantis Renault (Nanterre – France); Jérôme Uriot, CEESAR (Nanterre – France); Yoann Lafon, Philippe Beillas, Univ Lyon, Univ Gustave Eiffel, Univ Claude Bernard Lyon 1, LBMC UMR T_9406, F-69622 Lyon, France
- 5:00 ANNOUNCEMENTS AND ADJOURN**

November 8, Tuesday

Denver Ballroom

BIOMECHANICS IN MILITARY ENVIRONMENTS

Co-Chairs: Warren N. Hardy, Virginia Tech
John M. Cavanaugh, Wayne State University

- 9:30 Lower Extremity Validation of a Human Body Model for High Rate Axial Loading in the Underbody Blast Environment**
Zachary S. Hostetler, Juliette Caffrey, Jazmine Aira, and F. Scott Gayzik, Wake Forest School of Medicine- Biomedical Engineering
- 10:00 Quantifying the Effect of Pelvis Fracture on Lumbar Spine Compression during High-rate Vertical Loading**
David R. Barnes, SURVICE Engineering Co., Belcamp, MD, USA; Narayan Yoganandan, Jason Moore, John Humm, Frank Pintar, The Medical College of Wisconsin, Milwaukee, WI, USA; Kathryn L. Loftis, U.S. Army DEVCOM DAC, Aberdeen Proving Ground, MD, USA
- 10:30 SC: Boot Geometry Effects on Force Mitigation after Development of a New Boot Finite Element Model**
Carolyn E. Hampton, Michael Tegtmeyer, DEVCOM Army Research Laboratory, Aberdeen Proving Ground

10:45 -11:15 REFRESHMENT BREAK

PERFORMANCE OF ATDs IN FRONTAL IMPACTS

- 11:15 THOR-05F Response in Sled Tests Inducing Submarining and Comparison with PMHS Response Corridors**
Olivier Richard, Faurecia Automotive Seating; Matthieu Lebarbé, Jérôme Uriot, CEESAR; Xavier Trosseille, Philippe Petit, LAB PSA Peugeot-Citroën Renault; Z. Jerry Wang, Humanetics Innovative Solutions; Ellen Lee, NHTSA
- 11:45 A Comparison of the Mid-Size Male THOR and Hybrid III ATDs in Vehicle Frontal Crash Tests**
Chris O'Connor, Agnes Kim, Tim Barrette, Ford Motor Company; Jeff Dix, Nissan NA

12:15 – 2:00 LUNCH

2:00 JOHN PAUL STAPP 2019 BEST PAPER AWARD

Presented by General Chair, Annette L. Irwin to Yun-Seok Kang, John H. Bolte IV, Injury Biomechanics Research Center, The Ohio State University; Jason Stammen, Kevin Moorhouse, National Highway Traffic Safety Administration; Amanda M. Agnew, Injury Biomechanics Research Center, The Ohio State University for *A Novel Approach to Scaling Age-, Sex-, and Body Size-Dependent Thoracic Responses using Structural Properties of Human Ribs.*

ADVANCES IN HUMAN BODY MODELS AND STATISTICAL ANALYSIS OF DATA

Co-Chairs: Priya Prasad, Prasad Engineering LLC
Saeed Barbat, Ford Motor Company

- 2:15 Understanding Head Injury Risks During Car-to-Pedestrian Collisions Using Realistic Vehicle and Detailed Human Body Models**
Kalish Gunasekaran, Sakib Ul Islam, Mechanical and Materials Engineering, Western University, London ON, Canada; Haojie Mao, Mechanical and Materials Engineering/. School of Biomedical Engineering, Western University, London ON, Canada
- 2:45 Effect of Tissue Erosion Modeling Techniques on Pedestrian Impact Kinematics**
Daniel Grindle and Costin Untaroiu, Center for Injury Biomechanics, Virginia Tech
- 3:15 – 3:45 REFRESHMENT BREAK**
- 3:45 SC: A Quantitative Correlation between Two Partially Defined Surfaces**
Carolyn E Hampton, Michael Kleinberger, DEVCOM Army Research Laboratory, Aberdeen Proving Ground; Joseph LeSueur, Frank A Pintar, Joint Department of Biomedical Engineering, Marquette University & Medical College of Wisconsin
- 4:00 Variations in User Implementation of the CORA Rating Metric**
Devon L. Albert, Center for Injury Biomechanics, Department of Biomedical Engineering and Mechanics, Virginia Tech
- 4:30 ANNOUNCEMENTS AND ADJOURN TO DTS RECEPTION – Prospects Restaurant**

November 9, Wednesday

Denver Ballroom

DRIVER BEHAVIOR DURING BACKING AND TURNING, AND EFFECTS OF AGE/STATURE/OBESITY ON OCCUPANT SITTING/POSTURE

Co-Chairs: Frank A. Pintar, Medical College of Wisconsin
Dainius J. Dalmotas, DJ Dalmotas Consulting Inc.

- 9:30 Effects of Technology on Drivers' Behavior during Backing Maneuvers**
Yasuhiro Matsui, National Traffic Safety and Environment Laboratory, Japan;
Shoko Oikawa, Tokyo Metropolitan University, Japan
Driving Behavior during Right-Turn Maneuvers at Intersections on Left-Hand Traffic Roads
Yasuhiro Matsui and Naruyuki Hosokawa, National Traffic Safety and Environment Laboratory, Japan; Shoko Oikawa, Tokyo Metropolitan University, Japan
- 10:15 Geometrical and Mechanical Characterization of the Abdominal Fold of Obese Post Mortem Human Subjects for Use in Human Body Modelling**
Matthieu Lebarbé, CEESAR (France); Philippe Beillas, Tomas Janak, Yoann Lafon, Univ Lyon, Univ Claude Bernard Lyon 1, Univ Gustave Eiffel, IFSTTAR, LBMC, UMR_T 9406 (F-69622 Lyon, France); Oliver Richard, Faurecia Automotive Seating (France); Philippe Petit, LAB PSA Peugeot Citroën Renault (Nanterre, France)
- 10:45 Self-reported Non-nominal Sitting in Passengers is Influenced by Age and Height**
Adam D. Goodworth and Jeremiah Canada, Westmont College
- 11:15 JOHN W. MELVIN BEST STUDENT PAPER AWARDS**
Presented by Saeed Barbat, Ford Motor Company
- 11:30 CONFERENCE ADJOURNMENT**
General Chair, Annette Irwin, General Motors