

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

PEDIATRIC BIOMECHANICS IN FRONTAL AND REAR IMPACTS

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

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

- 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**

ADVANCES IN HUMAN BODY MODELS AND STATISTICAL ANALYSIS OF DATA

- 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

November 9, Wednesday

Denver Ballroom

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

9:30 Effects of Technology on Drivers' Behavior during Backing Maneuvers

Yasuhiro Matsui, National Traffic Safety and Environment

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

11:30 CONFERENCE ADJOURNMENT

General Chair, Annette Irwin, General Motors