

STAPP 2023 TECHNICAL PROGRAM

67TH STAPP CAR CRASH CONFERENCE UNIVERSITY OF MICHIGAN UNION BUILDING ROGEL BALLROOM, 2ND FLOOR ANN ARBOR, MI

MONDAY OCTOBER 30

4:45 FOLLOWING THE NHTSA WORKSHOP ADJOURN TO WAYNE STATE UNIVERSITY (WSU) RECEPTION: 5:30 - 8:00 PM AT THE BIOMEDICAL ENGINEERING #1100, 818 W. HANCOCK ST., DETROIT
USE THE LINK TO RSVP: <https://events.wayne.edu/2023/10/30/post-nhtsa-workshop-reception-open-house-97488/>

TUESDAY OCTOBER 31

9:15 **Welcome and Opening Remarks**
General Chair, Saeed Barbat, Ford Motor Company

ADVANCES IN AIRBAGS DEVELOPMENT

Co-Chairs: Warren N. Hardy, Virginia Tech
Guy S. Nusholtz, Stellantis

9:30 **2023-01: Machine-Learning-Accelerated Simulations for the Design of Airbag Constrained by Obstacles at Rest**

José E. Valenzuela del Río, Elena Arvanitis, Lucia Mirabella, Siemens Corporations; Richard Lancashire, Karan Chatrath, Peter Ritmeijer, Siemens Industry Software Netherlands B.V.

10:00 **SC: Development of 'Relax Seat: Passenger Protection Airbag'**

Seokmin Lee, Dongyoung Kim, Dongjoon Lee, Seokhoon Ko, Garam Jeong, Jaehyun Lee, Hyundai Mobis

10:20 - 10:50 **REFRESHMENT BREAK**

FIELD DATA INJURY ANALYSIS AND TIME HISTORY SIGNAL ANALYSIS

Co-Chairs: Warren N. Hardy, Virginia Tech
Guy S. Nusholtz, Stellantis

10:50 **2023-03: Examination of Crash Injury Risk as a Function of Occupant Demographics**

Dainius Dalmotas, Aline Chouinard, Jean-Louis Comeau, Alan German, Glenn Robbins, D.J. Dalmotas Consulting Inc.; Priya Prasad, Prasad Engineering Inc.

11:20 **SC: Statistical Estimation of the Difference of Two Time-Histories**

Guy S. Nusholtz, Stellantis

11:40 **Invited Presentation "Future Mobility Impact on Restraints Systems Technology"**

Mutaz Shkoukani, Executive Director- System Performance, JOYSON SAFETY SYSTEMS

12:10 – 2:00 **LUNCH**

2:00 – 2:40 **KEYNOTE PRESENTATION: DR. HENRY LIU**, Director, Mcity; Director, Center for Connected and Automated Transportation (USDOT Region 5 UTC), Professor, UoM/UMTRI

VEHICLE-TO-PEDESTRIAN INJURY PREDICTIONS USING FEA, SIMULATIONS, AND FIELD DATA

Co-Chairs: John H. Bolte IV, The Ohio State University
 John M. Cavanaugh, Wayne State University

2:40 **SC: Numerical Investigations on the Factors Affecting Thorax Injuries in Vehicle vs. Pedestrian Accidents**
 Dhaval Jani, Karina Lehmann, VAIVA GmbH, Germany; Holger Staack, Christian Teichmann,
 Giacomo Marini, AUDI AG, Germany

3:00 **SC: Calibration of Kinematic Simulations of Pedestrian Injury Using Field Data**
 Wenbo Sun, Jingwen Hu, Carol Flannagan, Patrick Bowman, University of Michigan
 Transportation Research Institute; Iskander Farooq, Anil Kalra, Ford Motor Company

3:20 **SC: Comparison of Chinese and German in-depth accident data of pedestrian thorax and head injuries**
 Holger Staack, Volker Labenski, Giacomo Marini, AUDI AG; Yunshi Liang, VW China CSA

3:40 – 4:00 **REFRESHMENT BREAK**

WHEELCHAIR SEATED POSTURE; HEART STRAIN ANALYSIS

Co-Chairs: John H. Bolte IV, The Ohio State University
 John M. Cavanaugh, Wayne State University

4:00 **SC: Seated Posture of Occupants in Wheelchairs**
 Brennen T. McManus, Byoung-Keon, Daniel Park, Nichole R. Orton, Miranda St. Amour,
 Sheila M. Ebert, Jingwen Hu, Miriam A. Manary, Kyle J. Boyle, Laura Malik, Tyler Vallier,
 Matthew P. Reed, Kathleen D. Klinich, University of Michigan Transportation Research Institute

4:20 **SC: Development of Proactive Anti-Whiplash System through a Combined Computational and Experimental Approach**
 Kalish Gunasekaran, Yuze Li, Mechanical and Material Engineering, Western University; Qi Zhang,
 Department of Pathology and Laboratory Medicine, Western University; Haojie Mao, Mechanical
 and Material Engineering, Western University/School of Biomedical Engineering, Western
 University

4:40 **ANNOUNCEMENT AND ADJOURN TO UNIVERSITY OF MICHIGAN TRANSPORTATION RESEARCH
INSTITUTE (UMTRI) AND HUMANETICS RECEPTION 5:00PM – 6:30 PM, 2901 Baxter Road, Ann Arbor**

WEDNESDAY NOVEMBER 1

BIOMECHANICS IN MILITARY AND SPORTS ENVIRONMENTS

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

9:00 2023-04: Comparison of Adult Female and Male PMHS Pelvis and Lumbar Response to Underbody Blast
Hollie A. Pietsch, US Army DEVCOM Ground Vehicle Systems Center/Wayne State University, Department of Biomedical Engineering; Danielle M. Cristino, Andrew R. Kemper, Matthew J. Mason, Warren N. Hardy, Virginia Tech, Center for Injury Biomechanics; Kerry A. Danelson, Wake Forest University School of Medicine, Department of Orthopaedic Surgery and Rehabilitation; John H. Bolte IV, The Ohio State University, Injury Biomechanics Research Center; John M. Cavanaugh, Wayne State University, Department of Biomedical Engineering

9:30 SC: Low-Rate Ankle Stiffness in Human Volunteers
Julia Polich, Kaitlin Henry, Garrett Bullock, Paula Gangopadhyay, Aaron Scott, Kerry Danelson, Wake Forest University School of Medicine, Department of Orthopaedic Surgery and Rehabilitation, Atrium Health Musculoskeletal Institute; Erika Matheis, Bennett Aerospace Inc.; Michael Tegtmeyer, DEVCOM Army Research Laboratory; John Bolte IV, The Ohio State University, Injury Biomechanics Research Center

9:50 SC: Sex-Based Differences in Calcaneal Fracture Tolerance under High-Rate Axial Loading
Davide W. Ceritano, Danielle M. Cristino, Warren N. Hardy, Virginia Tech, Center for Injury Biomechanics; Kerry A. Danelson, Wake Forest University School of Medicine, Department of Orthopaedic Surgery and Rehabilitation

10:10 - 10:40 REFRESHMENT BREAK

10:40 DISTINGUISHED STAPP BOARD/COMMITTEE RECENT RETIREE MEMBER RECOGNITION

PERFORMANCE EVALUATIONS OF NEXT GENERATION FRONTAL IMPACT ATDs

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

11:00 2023-05: Investigation of the THOR-AV 5F Biofidelity in Sled Test Conditions with A Semi-Rigid Seat
Z. Jerry Wang, Humanetics Innovative Solutions, Inc.; John Humm, Hans W. Hauschild, Medical College of Wisconsin

11:30 SC: Thoracic Response of the Hybrid III and THOR Small Female ATDs in Matched Frontal Sled Tests
David M. Boyle, Devon L. Albert, Warren N. Hardy, Andrew R. Kemper, Virginia Tech, Center for Injury Biomechanics

11:50 – 2:00 LUNCH

2:00 – 2:30 KEYNOTE PRESENTATION: EMILY FRASCAROLI, Global Director, Automotive Safety Office, Environmental and Safety Compliance, Ford Motor Company

BIOMECHANICS EVALUATIONS OF REAR SEAT OCCUPANT RESPONSES IN FRONTAL IMPACT

Co-Chairs: Priya Prasad, Prasad Engineering LLC
Warren N. Hardy, Virginia Tech

2:30 2023-06: Frontal-Crash Occupant Protection in the Rear Seat: Submarining and Abdomen/Pelvis Response in Midsized Male Surrogates

Allison J. Guettler, Samuel T. Bianco, Devon L. Albert, David M. Boyle, Andrew R. Kemper, Warren N. Hardy, Virginia Tech, Center for Injury Biomechanics

3:00 SC: Evaluation of the Thoracic Response of Male Post Mortem Human Surrogates in the Rear Seat during Frontal Impacts

Samuel T. Bianco, Allison J. Guettler, Devon L. Albert, David M. Boyle, Warren N. Hardy, Andrew R. Kemper, Virginia Polytechnic Institute, Center for Injury Biomechanics

3:20 – 3:50 REFRESHMENT BREAK

3:50 -4:00 JOHN PAUL STAPP 2020 - 2022 BEST PAPER AWARD

Presented by General Chair, Saeed Barbat to Sahar Benadi, LAB PSA Renault/Univ Gustave Eiffel - Univ Claude Bernard Lyon 1; Xavier Trosseille and Philippe Petit, LAB PSA Renault; Jerome Uriot, CEESAR; Yoann Lafon and Philippe Beillas, Univ Gustave Eiffel - Univ Claude Bernard Lyon 1

BRAIN INJURY; HEART STRAIN ANALYSIS

Co-Chairs: Priya Prasad, Prasad Engineering LLC
Warren N. Hardy, Virginia Tech

4:00 2023-07: Evaluation of DAMAGE in Vehicle Frontal Crashes

Priya Prasad, Prasad Engineering Inc.; Saeed Barbat, Anil Kalra, Ford Motor Company; Dainius Dalmotas, D.J. Dalmotas Consulting Inc.

4:30 SC: Exploring Heart Strain from Blunt Trauma through a Parametric Investigation of Real-World *Commotio Cordis* Cases

Grant James Dickey, Jainee Patel, Sarang Shin, School of Biomedical Engineering, Western University; Kewei Bian, Sakib Ul Islam, Department of Mechanical and Materials Engineering, Western University; Erin Shore, Kristen Kucera, National Center for Catastrophic Sport Injury Research, University of North Carolina; Haojie Mao, School of Biomedical Engineering, Western University/Department of Mechanical and Materials Engineering, Western University

4:50 ANNOUNCEMENT AND ADJOURN TO DIVERSIFIED TECHNICAL SYSTEMS INC. (DTS) RECEPTION 5:00 PM – 7:00 PM AT MICHIGAN LEAGUE IN THE CONCOURSE, 911 N. UNIVERSITY AVENUE, ANN ARBOR

THURSDAY NOVEMBER 2

9:00 – 10:30 PANEL DISCUSSION: “BEYOND THE 50TH PERCENTILE MALE . . .” A Discussion of Vulnerable Occupant Protection

Panelists: Shaun Kildare, AHAS; Jessica Jermakian, IIHS; Matt Craig, NHTSA; Kerry Danelson, WFU School of Medicine; Jason Hallman, Toyota CSRC; Kristin Kingsley, AAI; Warren Hardy, VT CIB (Chairman); Saeed Barbat, Ford (Moderator)

10:30 – 10:50 COFFEE BREAK

10:50 – 11:00 JOHN W. MELVIN BEST STUDENT PAPER AWARD

HUMAN BODY MODEL APPLICATION IN INJURY PREDICTIONS; DRIVER BEHAVIOR

Co-Chairs: John M. Cavanaugh, Wayne State University
Frank A. Pintar, Medical College of Wisconsin

11:00 2023-08: Standardized Assessment of Gravity Settling Human Body Models for Virtual Testing
B. Wade von Kleeck, Juliette Caffrey, Ashley A. Weaver, F. Scott Gayzik, Biomedical Engineering,
Wake Forest University School of Medicine; Jason Hallman, Toyota Motor North America R&D

11:30 2023-09: Driving Behavior during Left-Turn Maneuvers at Intersections on Left-Hand Traffic Roads
Yasuhiro Matsui, Masashi Narita, National Traffic Safety and Environment Laboratory, Japan;
Shoko Oikawa, Tokyo Metropolitan University, Japan

12:00 CLOSING REMARKS AND ADJOURN
General Chair: Saeed Barbat, Ford Motor Co.