63rd Stapp Car Crash Conference
Technical Program

Monday, November 11

9:00  WELCOME AND OPENING REMARKS
      John H. Bolte IV, General Chair
      Injury Biomechanics Research Center, The Ohio State University

      Tribute to Dr. Alan M. Nahum and Richard F. Chandler

9:15  Future Challenges and Needs of Road Safety Impact Protection – A Global Perspective
      Jac S.H.M. Wismans, SAFETEQ, The Netherlands

HEAD/brain biomechanics and modeling

Co-Chairs: Erik G. Takhounts, National Highway Traffic Safety Administration
           Warren N. Hardy, Virginia Tech Center for Injury Biomechanics

9:45  Brain Strain from Motion of Sparse Markers
      Zhou Zhou, Xiaogai Li, Svein Kleiven, KTH Royal Institute of Technology; Warren N. Hardy,
           Virginia Tech-Wake Forest Center for Injury Biomechanics

10:15 SC - Machine Learning Based Model for Predicting Head Injury Criterion (HIC)
      Vikas Hasija, Bowhead (Systems & Technology); Erik G. Takhounts, National Highway Traffic
           Safety Administration

10:30-11:00 REFRESHMENT BREAK

11:00 Human Response and Injury Resulting from Head Impacts with Unmanned Aircraft Systems
      David B. Stark, Arrianna K. Willis, Zach Eshelman, Yun-Seok Kang, Rakshit Ramachandra,
      John H. Bolte IV, Injury Biomechanics Research Center, The Ohio State University; Matthew
      McCrink, Aerospace Research Center, The Ohio State University

11:30 Development of a Subhuman Primate Brain Finite Element Model to Investigate Brain Injury
      Thresholds Induced by Head Rotation
      Tushar Arora, Liying Zhang, Wayne State University; Priya Prasad, Prasad Engineering, LLC

12:00–2:00 LUNCH

LABORATORY TESTING OF ATDs AND OTHER SURROGATES IN SIDE IMPACTS – PART 1

Co-Chairs: Frank A. Pintar, Medical College of Wisconsin
           Annette L. Irwin, General Motors LLC

2:00  PMHS and WorldSID Kinematic and Injury Response in Far-Side Events in a Vehicle-Based Test
      Environment
      Daniel Perez-Rapela, John-Paul Donlon, Jason L. Forman, Jeff R. Crandall,
      University of Virginia, Center for Applied Biomechanics; Bengt Pipkorn, Benjamin K. Shurtz,
      Autoliv; Craig Markusic, Honda R&D Americas

2:30 Far Side Impact Injury Threshold Recommendations Based on 6 Paired WorldSID/Post-Mortem
      Human Subject Tests
      Philippe Petit, Xavier Trosseille, LAB PSA Peugeot Citroën Renault (Nanterre – France); Jérôme
      Uriot, David Poulard, Pascal Potier, Pascal Baudrit, CEESAR (Nanterre – France); Sabine
      Compigne, Toyota Motor Europe NV/SA (Belgium); Masato Kunisada, Kenji Tsurui, Toyota Motor
      Corporation (Japan)

3:00  SC - Investigating Combined Thoracic Loading Using the Elderly Female Dummy (EFD)
      Michael Beebe, Kris Sullenberger, Mark Burleigh, Joseph McCarthy, Humanetics Innovative
      Solutions; John H. Bolte IV, Injury Biomechanics Research Center, The Ohio State University

3:15–3:45 REFRESHMENT BREAK
LABORATORY TESTING OF ATDs AND OTHER SURROGATES IN SIDE IMPACTS – PART 2

Co-Chairs:  Annette L. Irwin, General Motors LLC  
            Frank A. Pintar, Medical College of Wisconsin

3:45  The ShIC: A Shoulder Injury Criterion for the EuroSID-2re Applicable in a Large Loading Condition Spectrum of the Military Domain  
      Matthieu Lebarbe and Pascal Baudrit, CEESAR; Denis Lafont, DGA-TT, French Ministry of Defense

4:15  Response Ratio Development for Lateral Pendulum Impact with Porcine Thorax and Abdomen Surrogate Equivalents  
      Jennifer L. Yaek, John M. Cavanaugh, Wayne State University; Stephen W. Rouhana, Vehicle Safety Sciences LLC

4:45  ANNOUNCEMENTS

Tuesday, November 12

PEDIATRIC BIOMECHANICS, INJURY RISK, AND ATD RESPONSES

Co-Chairs:  Kristy B. Arbogast, Children’s Hospital of Philadelphia  
            Farid Bendjellal, Britax Childcare Limited

9:00  Factors Affecting Child Injury Risk in Motor-Vehicle Crashes  
      Marco Benedetti, Kathleen D. Klinich, Miriam A. Manary, Carol A.C. Flannagan, University of Michigan Transportation Research Institute

9:30  SC - Novel Use of a Halo Orthosis on Pediatric Anthropomorphic Test Devices (ATDs) in Frontal Sled Tests  
      Julie A. Mansfield, John H. Bolte IV, Injury Biomechanics Research Center, The Ohio State University; Eric A. Sribnick, Nationwide Children’s Hospital/The Ohio State University College of Medicine; Carrie Rhodes, Nationwide Children’s Hospital; Vera Fullaway, Safe Traffic System, Inc.

9:45  Biofidelic Evaluation of the Large Omni-Directional Child Anthropomorphic Test Device in Low-Speed Loading Conditions  
      Thomas Seacrist, Jalaj Maheshwari, Valentina Graci, The Children’s Hospital of Philadelphia; Christine M. Holt, Raul Akkem, Gregory Chingas, Drexel University; Ethan C Douglas, Madeline Griffith, University of Pennsylvania; Aimee J. Palumbo, Temple University

10:15  SC - Pediatric Cervical Spine Strength and Stiffness in the Sagittal Plane  
      Yadetsie N. Zaragoza-Rivera, John H. Bolte IV, Laura C. Boucher, Injury Biomechanics Research Center, The Ohio State University

10:30-11:00  REFRESHMENT BREAK

RESPONSE AND INJURY DURING HIGH-SPEED VERTICAL LOADING

Co-Chairs:  Jonathan D. Rupp, Emory School of Medicine  
            John M. Cavanaugh, Wayne State University

11:00  Kinematic and Biomechanical Response of Post-Mortem Human Subjects Under Various Pre-Impact Postures to High-Rate Vertical Loading Conditions  
      Lauren Wood Zaseck, Anne C. Bonifas, Carl S. Miller, Nichole Ritchie Orton, Matthew P. Reed, University of Michigan Transportation Research Institute; Constantine K. Demetrropoulos, Kyle A. Ott, Christopher J. Dooley, Nathanael P. Kuo, Leah M. Strohsnitter, Joseph R. Andrist, Mary E. Luongo, David G. Drewry III, Andrew C. Merkle; The John Hopkins University Applied Physics Laboratory; Jonathan D. Rupp, Emory University

11:30  Analysis of Force Mitigation by Boots in Axial Impacts Using a Lower Leg Finite Element Model  
      Carolyn E. Hampton, Michael Kleinberger, U.S. Army Research Laboratory; Michael Schlick, Narayan Yoganandan, Frank A. Pintar, Medical College of Wisconsin at Zablocki Medical Center

12:00-2:00  LUNCH
John Paul Stapp Best Paper Award – The John Paul Stapp Award for the best paper of the 2018 conference and journal will be presented by Warren N. Hardy to Amanda M. Agnew, Michelle M. Murach, Victoria M. Dominguez, Akshara Sreedhar, Elina Misicka, Angela Harden, John H. Bolte IV, Injury Biomechanics Research Center, The Ohio State University; Jason Stammen, Kevin Moorhouse, National Highway Traffic Safety Administration, Vehicle Research and Test Center; Yun-Seok Kang, Injury Biomechanics Research Center, The Ohio State University for: Sources of Variability in Structural Bending Response of Pediatric and Adult Human Ribs in Dynamic Frontal Impacts.

Invitation and Call for Papers – General Chair, Annette L. Irwin, General Motors LLC

RESPONSE, INJURY, AND MODELING OF THE THORAX
Co-Chairs: Philippe Beillas, Université de Lyon; IFSTTAR, LBMC; Université Lyon 1, France
John M. Cavanaugh, Wayne State University

2:15 Assessment of Several THOR Thoracic Injury Criteria Based on a New Post Mortem Human Subject Test Series and Recommendations
Xavier Trosseille, Philippe Petit, LAB PSA Renault; Jérôme Uriot, Pascal Potier, Pascal Baudrit, CEESAR

2:45 A Novel Approach to Scaling Age-, Sex-, and Body Size-Dependent Thoracic Responses Using Structural Properties of Human Ribs
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

3:15-3:45 REFRESHMENT BREAK

3:45 SC - Volume and Pressure Considerations in Human Body Modeling
Jiri Kral and Anderson de Lima, General Motors Company

4:00 SC - Improvements in Simulations of Aortic Loading by Filling in Voids of the Global Human Body Model
Anderson de Lima and Jiri Kral, General Motors Company

INVITED STUDENT PRESENTATIONS (ORAL ONLY)
Chair: John H. Bolte IV, Injury Biomechanics Research Center, The Ohio State University

4:15 Evaluating the Effect of Muscle Activation on Head Motion During Non-Injurious Impact in Human Volunteers
Kristen A. Reynier, University of Virginia, Center for Applied Biomechanics

4:45 Quantifying Relative Brain Motion in a Post Mortem Human Subject
Angela Tesny, Injury Biomechanics Research Center, The Ohio State University

5:15 ANNOUNCEMENTS AND ADJOURN TO DTS RECEPTION

Wednesday, November 13

A NEW TECHNOLOGY FOR STAGED CRASHES AND EFFECTS OF CRASH AVOIDANCE TECHNOLOGIES
Co-Chairs: Dainius J. Dalmotas, Dalmotas Consulting, Inc.
Saeed Barbat, Ford Motor Company

9:00 A Sensor Suite for Toeboard Three-Dimensional Deformation Measurement During Crash
Mengyu Song, Cong Chen, Virginia Polytechnic Institute and State University; Tomonari, Furukawa, University of Virginia; Azusa Nakata, Shinsuke Shibata, Honda R&D Co., Ltd.

9:30 SC - The Effect of an Acoustic Startling Warning on Take-Over Reaction Time and Trunk Kinematics for Drivers in Autonomous Driving Scenarios
Valentina Graci, Madeline Griffith, Jalaj Maheshwari, Rahul Akkem, Meta Austin, Thomas Seacrist, Kristy B. Arbogast, Children’s Hospital of Philadelphia
9:45  SC - Passenger Injury Analysis Considering Vehicle Crash after AEB Activation  
Seokhoon Ko, Garam Jeong, Dohyung Kim, Haekwon Park, Kyusang Lee, Raeick Jang, Hyundai Mobis

10:00-10:30  REFRESHMENT BREAK

10:30  SC - An Experimental Confirmation of the Occupant Kinematic Response for Out of Position and Belt Tensioning Effect During Collision Avoidance System  
Myeongkwan Kang, Dohyung Lim, Mechanical Engineering at Sejong University in Korea; Hyung Joo Kim, Seonglae Kim, Youngkuen Cho, Automotive Research & Development Division at Hyundai Motor Group in Korea

10:45  Pedestrian Detection During Vehicle Backing Maneuvers Using Ultrasonic Parking Sensors  
Yasuhiro Matsui, Naruyuki Hosokawa, National Traffic Safety and Environment Laboratory, Japan; Shoko Oikawa, Tokyo Metropolitan University Japan

11:15  JOHN W. MELVIN BEST STUDENT PAPER AWARDS  Presentation by Albert I. King, Wayne State University

11:30  CLOSING REMARKS AND ADJOURNMENT  
General Chair, John H. Bolte IV, Injury Biomechanics Research Center, The Ohio State University