## JUSTIN R. BRINK, MSBE

Managing Forensic Expert - Biomechanics & Accident Reconstruction

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## EDUCATION

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|---|---|
| MSBE | Master of Science in Biomedical Engineering (Biomechanics and Human Factors Option)<br>University of Nevada, Las Vegas, 2012 |
| BSME | Bachelor of Science in Kinesiological Science<br>University of Nevada, Las Vegas, 2003 |

## PROFESSIONAL CERTIFICATIONS

Engineer Intern – State of Nevada - #0T6492

## MEMBERSHIPS

Society of Automotive Engineers International (SAE)

Southwestern Association of Technical Accident Investigators (SATAI) (member of the Board of Directors)

National Association of Professional Accident Reconstruction Specialists (NAPARS)

Association for the Advancement of Automotive Medicine (AAAM)

American Society of Testing and Materials (ASTM)
- Participating member of Committee F13 – Pedestrian/Walkway Safety and Footwear

Golden Key International Honour Society

## WORK EXPERIENCE

***Aperture, LLC, 2025/Present***
6351 Hinson St., Ste. R
Las Vegas, NV 89118

***Forensic Science and Biomechanics, LLC, 2021/2025***
*Accident Reconstructionist and Biomechanical Engineer*
1930 Village Center Circle, Ste. 3-291
Las Vegas, NV 89134

Expertise aimed at analyzing and providing findings for vehicle dynamics in low speed motor vehicle collisions, vehicle dynamics in high speed motor vehicle collisions, motor vehicle occupant biomechanics, instrumentation and analyses of vehicle impact dynamics and associated live occupant, and/or ATD, biomechanics during crash testing, human factors characteristics pertaining to perception-response times, accidents involving pedestrian impacts, motor cycle accidents, premises liability, slip and falls, and human gait characteristics.

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***American Bio Engineers, LLC, 2011/2021***
*Accident Reconstruction and Biomechanical Specialist*

6351 Hinson St., Ste. R
Las Vegas, NV 89118

2305 Historic Decatur Rd., Ste. 100
San Diego, CA 92106

7272 E Indian School Rd., Ste 540
Scottsdale, AZ 85251

Analyzed and provided expert opinions for vehicle dynamics in low speed motor vehicle collisions, vehicle dynamics in high speed motor vehicle collisions, motor vehicle occupant biomechanics, instrumentation and analyses of vehicle impact dynamics and associated live occupant, and/or ATD, biomechanics during crash testing, human factors characteristics pertaining to perception-response times, accidents involving pedestrian impacts, motor cycle accidents, premises liability, slip and falls, and human gait characteristics.

***University of Nevada, Las Vegas, 2008/2010***
*Graduate Student*

Participated and assisted in formal research for a U.S. Army funded study for evaluating biomechanical characteristics of unilateral transtibial amputee gait. Aided and conducted human subject instrumentation, data collection, data reduction, the design of an algorithm for data reduction, statistical analyses and coauthoring of manuscripts.

***JBA Consulting Engineers, 2008/2011***
*Mechanical Department – Junior level design*

Worked collaboratively and independently to design mechanical systems (HVAC and plumbing) for commercial buildings. Responsibilities included the application of fluids mechanics for proper functionality, implementation of software systems, primarily AutoCAD and Revit, for design and production of plans, effective coordination with internal departments (Electrical and Audio/Visual) as well as external architectural firms and sub-contractors.

## PUBLICATIONS

Crowley, S., Marrero Torres, C., Kazmierczak, A., Furbish, C., Randles, B., & Brink, J. (2022). Utilizing EDR Data to Determine the Effects of Hard Braking on Delta-V Calculations in Low-to-Moderate Speed Impacts, Collision Magazine, 16(2), 82-90.

Vigil, C., Salboro, C., Jorgensen, M., Jones, B., Brink, J., & Swinford, S. (2022). Validation of Utilizing a Self-Propelled Crash Sled to Simulate Occupant Accelerations in Minor Rear-End Impacts, SAE Technical Paper, 2022-01-0857.

Swinford, S., Jones, B., Brink, J., Furbish, C., Welcher, J., & Anderson, R. (2021). Study of the Measurement of Generation 2 Toyota Event Data Recorders in Low-Speed Side Impacts, SAE Technical Paper, 2021-01-0904.

Brink, J., Swinford, S., Furbish, C., Jones, B., Welcher, J., & Anderson, R. (2020). Methods for Quantifying the Impact Severity of Low-Speed Side Impacts at Varying Angles, SAE Technical Paper, 2020-01-0641.

Furbish, C., Welcher, J., Brink, J., Jones, B., Swinford, S., and Anderson, R. (2019). Occupant Kinematics and Loading in Low Speed Lateral Impacts, SAE Technical Paper, 2019-01-1027. *Voted as one of the best papers for WCXTM World Congress Experience, selected to appear in Advances and Current Practices in Mobility: SAE International Conference Proceedings.

Jones B., Calabro M., Brink J., and Swinford S. (2017). Accuracy of the Momentum Energy Restitution Method for Offset Inline Rear-End Impacts. SAE International, 2017-01-1425.

Neumann E., Brink J., Yalamanchili K., and Lee. J. (2014). Use of a load cell and force-moment curves to compare transverse plane moment loads on transtibial residual limbs: a preliminary investigation. Prosthetics & Orthotics International, 38(3):253-262.

Neumann E., Brink J., Yalamanchili K., & Lee J. (2013). Regression Estimates of Pressure on Transtibial Residual Limbs Using Load Cell Measurements of the Forces and Moments Occurring at the Base of the Socket. Journal of Prosthetics and Orthotics, 25(1):1-12.

NOT FOR EXPERT DESIGNATION

Neumann E., Brink J., Yalamanchili K., & Lee J. (2012). Use of a load cell and force-moment analysis to examine transtibial prosthesis foot rollover kinetics for anterior-posterior alignment perturbations. Journal of Prosthetics and Orthotics, 24(4):160-173.

Neumann E., Yalamanchili K., Brink J., & Lee J. (2012). Transducer-based comparisons of the prosthetic feet used by transtibial amputees for different walking activities: a pilot study. Prosthetics & Orthotics International, 36(2):203-216.

" Load cells enhance study of prosthetic foot rollover" (with E Neumann, K Yalamanchili, J Lee). Lower Extremity Review. August 12, 2012, pp 29-36.

Neumann E., Yalamanchili K., Brink J., and Lee J. Measurement of Forces and Moments Transmitted to the Residual Limb. Final Report for project W81XWH-07-2-0084. U.S. Army Medical Research and Materiel Command. Fort Detrick, MD 2010.

Brink J. (2012). The use of a pylon mounted transducer for investigating the gait of transtibial amputees (Master's Thesis). Retrieved from ProQuest database. (UMI No. 1516947.)

## LECTURES PRESENTED

Co-presented a continuing education lecture entitled Validation of Utilizing a Self-Propelled Crash Sled to Simulate Occupant Accelerations in Minor Rear-End Impacts at the Society of Automotive Engineers World Congress Experience, April 2022.

Informational lecture on characteristics of accident reconstruction and biomechanics to the Law Offices of Farley, Choate & Wood, April 2021.

Informational lecture on characteristics of accident reconstruction and biomechanics to the Van Law Firm, November 2019.

Informational lecture on characteristics of accident reconstruction and biomechanics to the Tingey Injury Law Firm, March 2019.

Co-presented a continuing education lecture entitled Use of a Pylon Mounted Load Cell for Direct Measurement Studies of Transtibial Amputees at The American Orthotic & Prosthetic Association national assembly, Fall 2014.

Co-presented a continuing education lecture entitled Ground Reaction Force Determinants of Socket Pressure at The American Orthotic & Prosthetic Association national assembly, Fall 2011.

## EXPERT TESTIMONY

Qualified as an expert for motor vehicle accident reconstruction and biomechanics in the Eighth Judicial District Court for the State of Nevada.

Qualified as an expert for motor vehicle accident reconstruction and biomechanics in the Superior Court of the State of California.

## SPECIALIZED TRAINING/SEMINARS ATTENDED

"ARC-CSI Crash Conference" presented by ARC-CSI (Las Vegas, Nevada, 2011)

- Do you need a Search Warrant for CDR Data?
- What happens when a novice driver, backs a car while on the cell phone and enters the path of a motorcyclist?
- The Compatibility of "Push Bumpers" and Airbags
- A Short History of Nearly Everything (…about computers in Highway Safety)
- Applications of GPS Data in Collision Reconstruction
- Occupant Dynamics Simulations in Support of Litigation using MADYMO
- Intersection Collision: A Detailed Reconstruction from Cradle to Grave
- The Relationships of Momentum, PDOF and Delta-V
- Key Aspects of Highway and Roadway Design and Safety Appurtenances
- Auto Pedestrian Collision Analysis: Applications of formulas vs. real world testing data
- An introduction to the new CrashZone version 9 drawing program features

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"ARC-CSI Crash Conference" presented by *ARC-CSI* (Las Vegas, NV, 2012)
- Case Studies and Reconstruction Essentials for Tread Separation Accidents Involving Axle Tramp
- An Overview of GM Hybrid and Electric Vehicle Technology and Its Relationship to EDR Data
- Seat Belt Analysis
- Using ECM Diagnostic Data in Crash Reconstruction
- The Application of MADYMO to the Modeling of Real World Accidents
- Low Speed Collisions; Reconstruction Applications
- Low Speed Collisions; Biomechanical Analysis
- Drug Recognition Training
- Establishing Safe and Realistic Speed Limits
- Measuring Yaw Marks from Digital Maps
- Highway Design – Appurtenances
- ARAS 360 – Advanced Animation Made Easy

"ARC-CSI Crash Conference" presented by *ARC-CSI* (Las Vegas, NV, 2013)
- Damage, Energy and Computer Simulations
- Accident Reconstruction Using CRASH3 and LS-Dyna
- Braking Systems for Passenger Cars and Light Trucks
- Reliability of Crash Triggered Video and Data Recorders for Accident Reconstruction
- The Investigation of Transit System Events
- ARAS360: Combining Momentum Technology and SMAC Technology
- Differentiating Potentially Casual Pre-Crash Component Damage from Crash Damage
- Further Developments Regarding the Dynamic Modeling of Motor Vehicle Collision Response using the SDOF Approach
- Advances in Forensic Photography for Crash Investigations
- Motorcycle Crash Case Study and Evolving Motorcycle Technologies
- Determination of Vehicle Orientation at Ground Contact for Rollover Accidents
- PDOF, DOPF: What is it? How important is it?
- EDC: Reconstruction Techniques for Complex Crashes

"ARC-CSI Crash Conference" presented by *ARC-CSI* (Las Vegas, NV, 2014)
- Reconstruction Techniques for Analyzing Low Delta-V Crashes
- HVEDR: New Engines, New Software, New Coverage
- Human Fatigue & 1 Big Risk to Driver Performance
- Modern Methodologies in Accident Reconstruction
- Motorcycle Sliding Friction
- Quick Clearance of Serious Fatal Collisions Using GPS/GIS Technology
- Vehicle History Data Applications to Crash Reconstruction
- Conspicuity & Visibility: Issues & Testing
- Wheel Slip & It's Effect on Reported Vehicle Speed
- Impact of Inadequate Repairs on Vehicle Structural Integrity

"Faro Laser Scanner Training" presented by *FARO* (Los Angeles, CA, 2014)

"Certified XL Tribometrist Course" presented by *Excel Tribometers* (Chicago, IL, 2014)

"Crash Data Analyst Course" presented by *Collision Safety Institute* (Austin, TX, 2014)

"SATAI Conference" presented by the *Southwestern Association of Technical Accident Investigators (SATAI)* (Las Vegas, NV, 2015)
- Practical Evidence Interpretation Revisited & COLM, Vectors & Kinematics
- CRASH3 – Researching Stiffness Value
- Motorcycle Collisions

"SATAI Crash Conference" presented by the *Southwestern Association of Technical Accident Investigators (SATAI)* (Glendale, AZ, 2015)
- Member of the "Crash Crew" for instrumented crash testing
- Human Factors and Acceleration
- Compliance Crash Testing
- 3D Laser Scanning

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"Advanced Crash Reconstruction Utilizing Human Factors" instructed by *Jeffrey Muttart/Northwestern University Center for Public Safety* (Glendale, AZ, 2015)

"ARC-CSI Crash Conference" presented by *ARC-CSI* (Las Vegas, NV, 2016)
- Comparison of IIHS driver and passenger-side small overlap crash tests
- Photography for Crash Reconstruction
- Comparative Crash Analysis Using NHTSA NASS Crash Data and Other Sources
- Safely Working Around Hybrids, Electric Vehicles and Newer Safety Systems
- Motorcycle reconstruction techniques tied to testing
- Scene and Vehicle Data Analysis to Evaluate Pre-crash Brake Application
- Evaluation of Wheel Impact in a Rollover Collision Through Simulation and Comparison to a Crash Test
- Crash Reconstruction Case Studies
- Lateral Acceleration Through a Curve, Real World Measurements of Normal Drivers at the Expected higher End
- When do Airbags Deploy?
- 30?

"Introduction to the I-Codes" online training presented by the *International Code Council (ICC)* (2016)

"SATAI Conference" (Mesa, AZ, 2016)
- Motorcycle and Bicycle Reconstruction, Railroad Track Hazards and Helmet Examination
- Night Time Accident Documentation and Reconstruction
- Toxicology and Impaired Driving

"60th Stapp Car Crash Conference" presented by *SAE* (Washington, D.C., 2016)
- Age-Specific Injury Risk Curves for Distributed, Anterior Thoracic Loading of Various Sizes of Adults Based on Sternal Deflections
- The Effect of Rib Shape on Stiffness
- Effect of Abdominal Loading Location on Liver Motion: Experimental Assessment using Ultrafast Ultrasound Imaging and Simulation with a Human Body Model
- Biomechanical Responses of PMHS Subjected to Abdominal Seatbelt Loading
- Investigation of Pelvic Injuries on Eighteen Post Mortem Human Subjects Submitted to Oblique Lateral Impacts
- Responses and Injuries to PMHS in Side-Facing and Oblique Seats in Horizontal Longitudinal Sled Tests per FAA Emergency
- Association of Impact Velocity with Risks of Serious Injuries and Fatalities to Pedestrians in Commercial Truck-Pedestrian Accidents
- Traffic Accidents Involving Cyclists Identifying Causal Factors Using Questionnaire Survey, Traffic Accident Data, and Real-World Observation
- Evaluation of WIAMan Technology Demonstrator Biofidelity Relative to Sub-Injurious PMHS Response in Simulated Under-body Blast Events
- Biomechanical Response of Military Booted and Unbooted Foot-Ankle-Tibia from Vertical Loading
- Morphomics of the Talus
- New Risk Curves for NHTSA's Brain Injury Criterion (BrIC): Derivations and Assessments
- Development of an Unbiased Validation Protocol to Assess the Biofidelity of Finite Element Head Models used in Prediction of Traumatic Brain Injury
- Incidence of Neck Injury Among Belted Adult Occupants of Modern Light-Duty Vehicles
- Biomechanics of the Pediatric Spine: Injury Mechanisms and Influence on Head Protection
- Neck Injury Criteria: Historical Background – Regulation and NCAP
- Nij: The Nodding Dilemma
- Neck Injury Biomechanics: The Relative Importance of Compression, Tension, and Bending
- What is the True Cause of Whiplash Pain?
- Investigation of Intervertebral Kinematics in Rear Impact and Development of Potential Injury Criteria
- Development, Evaluation, and Sensitivity Analysis of Parametric Finite Element Whole-Body Human Models in Side Impacts
- Development and Full Body Validation of a 5th Percentile Female Finite Element Model
- Thoracic Injury Risk Curves for Rib Deflections of the SID-IIs Build Level D
- The Large Omnidirectional Child (LODC) ATD: Biofidelity Comparison with the Hybrid III 10 Year old

"Workshop on Multifactorial Analysis of Slip and Fall Events: Implications for Forensic & Safety Professionals" presented by *ASTM F13*(West Conshohocken, PA, 2017)
- A Coefficient of Friction Threshold for Safe Walking: The 0.50 Myth and Current State of the Literature
- Deterring Slips and Falls Through Informed Architectural Design

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- Analysis of Slip Dynamics Utilizing High-Speed Video and Glass Force Plate; Gait Adaptation on Surfaces with Different Degrees of Slipperiness
- The Influence of Shoe Construction and Design on Slip Resistance and Function for Casual Footwear
- Film Thickness and Other Factors that Affect Tribometer Measurements

Attendance of American Society of Testing and Materials (ASTM) Committee F13 – Pedestrian/Walkway Safety and Footwear meeting (West Conshohocken, PA, 2017)

"SATAI Conference" presented by the *Southwestern Association of Technical Accident Investigators (SATAI)* (Las Vegas, NV, 2017)

- Motorcycle Collision Reconstruction
- Structural Crashworthiness and Finite Element Crash Simulation
- Ran-off-Road Crashes: When the driver doesn't stay on the straight and narrow

"61$^{ST}$ Annual Scientific Conference" presented by *AAAM* (Las Vegas, NV, 2017)

- Three-Dimensional Brain Deformation Under Dynamic Head Rotation and Preliminary Assessment of Brain FE Models
- Estimation of Fiber Angels in Intercostal Muscle from Cadaveric Thoraces
- Parametric Cervical Spine Model for Rear-End Impact Simulations
- Evaluating Rib Fracture Risk Using a Probabilistic Approach in Finite Element Frontal Crash Reconstruction
- Efficacy of Seatbelt Routing Schemes on Newer Booster Child Seats in Simulated Frontal Motor Vehicle Crashes
- Comparison of WorldSID to PMHS Shoulder-to-Belt Interaction in Far-Side Impact Configurations
- Vehicle Safety for Wheelchair Users: The Role of Anthropometry
- Validation of an ICD-9-Cm map to AIS 2005 update 2008
- The Spanish ICU Trauma Registry (RETRAUCI) and its Role Defining the Trauma Patterns
- The Relationship Between Emergency Medical Service Response Time and Prehospital Death Following Motor Vehicle Crashes: Rural-Urban Disparities and Implications for Trauma System Performance Improvement
- Injury and Response Characteristics of the 5$^{TH}$ Percentile Female Lower Extremity Under Axial Loading
- Detailed Finite Element Model of a 50$^{TH}$ Percentile Male for Simulating Pedestrian Accidents
- Response of the Knee Joint to Translational and Bending Loads
- Effectiveness of Lowering the Blood Alcohol Concentration (BAC) Limit for Driving from .10 to .08 in the United States
- Burden of Road Traffic Injuries Related to Delays in Implementing Safety Belt Laws in Low- and Lower-Middle-Income Countries
- The Effectiveness of Child Restraint and Seat-Belt Legislation in Reducing Child Injuries: the Case of Serbia
- An Insight of WHO Accident Database by Cluster Analysis with Self Organizing Map (SOM)
- Novel Method of Estimating AROC Using an Injury Risk Curve for Biomechanical Injury Metric Selection
- Evaluation of a Combination of Community Initiatives to Reduce Driving While Intoxicated and Other Alcohol-Related Harm
- The Extent of Backover Collisions Internationally
- Using Medico-Legal Data to Investigate Fatal Older Road User Crash Circumstances and Risk Factors
- Association of Cell Phone Bans with Fatal Crashes Among Young Drivers
- Numerical Investigation of Driver Lower Extremity Injuries in Finite Element Frontal Crash Reconstruction
- A Preliminary Study of Human Model Head and Neck Response to Frontal Loading in Non-Traditional Occupant Seating Configurations
- Influence of Morphological Variations on Cervical Spine Segmental Responses from Inertial Loading
- Failed Rib Region Prediction in a Human Body Model During Crash Events with Pre-Crash Braking
- Initial Analysis of Archived Non-Human Primate Frontal and Rear Impact Data from the Biodynamics Data Resource
- Occupant Kinematics of the Hybrid III, THOR-M, and Post-Mortem Human Surrogates Under Various Restraint Conditions in Full-Scale Frontal Sled Tests
- Kinematics and Dynamic Responses of Young and Elderly Occupants in Low-Speed Frontal Tests
- Injury Risk Functions Based on Population-Based Finite Element Model Responses: Application to Femurs Under Dynamic Three-Point Bending
- Trunk Muscle Recruitment Patterns in Simulated Pre-Crash Events
- Comparison of Three-Point Belt Fit Between Humans and ATDs in Rear Seats

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- Does Obesity Affect the Position of Seat Belt Loading in Occupants Involved in Real-World Motor Vehicle Collisions?
- Active Muscle Response Contributes to Increased Injury Risk of Lower Extremity in Occupant-Knee Airbag Interaction
- Using Naturalistic Driving Data to Better Understand the Driving Exposure and Patterns of Older Drivers
- Analysis of Near Crashes Among Novice Teen, Young Adult, and Experienced Adult Drivers Using the SHRP2 Naturalistic Driving Study
- Evaluating Drugged Driving: Effects of Pain and Anxiety Medications
- Driving Style Indicator Using UDRIVE NDS Data
- An Evaluation of the Real-World Safety Effect of a Lane-Change Driver Support System and Characteristics of Lane-Change Crashes Based on Insurance Claims Data
- Comparison of Outlier Heartbeats Identification and Spectral Transformation Strategies for Deriving Heart Rate Variability Indices for Drivers in Different Stages of Sleepiness
- Advanced Driver Assistance Systems for Teen Drivers: Teen and Parent Impressions, Perceived Need, and Intervention Preferences
- Frontal and Oblique Crash Tests of HIII6y Child ATD Using real-World, Observed Child Passenger Postures
- Kinematics and Shoulder Belt Engagement of Children on Belt-Positioning Boosters During Evasive Steering Maneuvers
- The Influence of Child Restraint Lower Attachment Method on Protection Offered by Forward Facing Child Restraint Systems in Oblique Loading Conditions
- Top Tether Effectiveness During Side Impacts
- Effectiveness of Booster Child Restraint Systems in Nearside Motor Vehicle Crashes with and without Side Curtain Airbags
- Trends in Child Passenger Safety Practices in Indiana from 2009-2015
- Injury Analysis of Patients According to Impact Patterns Involved in Pedestrian Traffic Crashes
- Oblique Impact Response of Elastomeric Damper Matrix Helmets
- Differences in the Protective Capabilities of Bicycle Helmets in Real-World and Standard-Specified Impact Scenarios
- Observation of Cyclist Exposure to Car Doors and Latent Impact Speed: A Case Study in Melbourne, Australia
- The Effects of Collision Type and Crash Extent on the Occupant's Abdominal Injury in Motor Vehicle Accidents
- AIS Scores in Spine and Spinal Cord Trauma: Epidemiological Considerations
- Functional Outcomes of Thoracic Injuries in Pediatric and Adult Occupants
- Quality of Head Injury Coding from Autopsy Reports with AIS © 2005 Update 2008
- Improvement of Injury Severity Prediction (ISP) of AACN During On-Site Triage Using Vehicle Deformation Pattern for Car to Car (C2C) Side Impacts

"45th International Workshop on Human Subjects for Biomechanical Research" presented by *National Highway Traffic Safety Administration* (Charleston, SC, 2017)

- Parametric Analysis and Optimization of Variables Affecting the Brain Injury Criterion BrIC in Various Crash Scenarios
- "BrIC Overpredicts the Field Brain Injury Risk" – Myth or Reality?
- Preliminary Tests for the Development of Brain Response Corridors Using High-Speed Biplane X-ray
- Simplified Human Body Model Performance Compared to Multidirectional Human Volunteer Testing
- Quantifying the Biomechanical Response of the Human Brain During Head Rotational Loading
- The Impact Responses of Non-Certified Motorcycle Helmets: Cheaper and Better?
- Parametric Studies on Effects of Three-Point Seatbelt on Lower Spine Forces in Frontal Crashes
- Aging Alters Human Rib Cage Behavior under Dynamic Loading
- Low-Uncertainty Estimates of Single Head Impact Doses in Athletes
- A Three-Dimensional Immersive Environment to analyze Biomechanical Data from Small Female PMHS Sled Tests in Oblique Frontal Impacts
- THOR 5th Dummy FE Model Development and 3-D Printed Rib Update
- Biofidelity Evaluation of THOR 5th Percentile Female ATD
- Investigation of Pedestrian Kinematics and Injury Response with Respect to Pedestrian Anthropometry and Vehicular Shape
- Characterization of Human Motion in On-Road Pre-Crash Vehicle Maneuvers

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- The Effect of Helmet Mass and Motion on Concussion Risk in Youth Football Players
- Comparing Human Femur Geometries between Populations in the Unites States and China

"61st STAPP Car Crash Conference" presented by *SAE* (Charleston, SC, 2017)
- Biomechanics of Lumbar Motion-Segments in Dynamic Compression
- Human Shoulder Response to High Velocity Lateral Impact
- Effect of Postmortem Time and Preservation Fluid on the Tensile Material Properties of Bovine Liver Parenchyma
- Development of Improved Brain Injury Predictors for Diverse Impacts
- Strain-Rate Dependency of Axonal Tolerance for Uniaxial Stretching
- Belted Female Occupants in Frontal Car Crashes are More Likely to Sustain Moderate Concussions than Male Occupants
- An Overview of the Magnitude and Nature of the Chest Injury Problem in Frontal Crashes
- Observations on Thoracic Injury Prediction and the Influence of Age
- Chest Deflections of the THOR and Hybrid III Dummies in Equal Severity Impacts
- The Insurance Institute for Highway Safety's Perspective on Addressing Chest Injuries in Car Crashes
- Optimizing Seat Belt and Airbag Designs for Rear Seat Occupant Protection in Frontal Crashes
- Occupant Torso Kinematics in Low Acceleration Time-Extended Evasive Swerving Events
- Occupant Kinematics in Simulated Autonomous Driving Vehicle Collisions: Influence of Seating Position, Direction and Angle
- Human Foot-Ankle Injuries and Associated Risk Curves from Under Body Blast Loading Conditions
- Development of the CAVEMAN Human Body Model: Validation of Lower Extremity Sub-Injurious Response to Vertical Accelerative Loading
- Neck Injury Response in High Vertical Accelerations and its Algorithmical Formation to Mitigate Neck Injuries
- Biofidelity Evaluation of the THOR and Hybrid III 50th Percentile Male Frontal Impact Anthropomorphic Test Devices
- Analysis of Repeatability and Reproducibility Standards of ATD Response for the Correlation Method
- Multi Directional THOR Testing Comparison to an Updated FE THOR Model
- Leveraging Human Body Models of Varying Complexity for Computational Efficiency
- Application of Extreme Value Theory to Crash Data Analysis
- New References PMHS Tests to Assess Whole-Body Pedestrian Impact Using a Simplified Generic Vehicle Front-End
- Association of Impact Velocity with Serious-Injury and Fatality Risks to Cyclists in Commercial Truck-Cyclist Accidents
- Pedestrian Flex-PLI Legform Test Performance for Seven Early 2000's Small Cars
- Optimal Specifications for the Advanced Pedestrian Legform Impactor

"SATAI Conference" presented by the *Southwestern Association of Technical Accident Investigators (SATAI)* (Glendale, AZ, 2018)
- Low Speed Crash Analysis Fundamentals
- Momentum, Energy & Restitution Method (MER) for Low Speed Crash Reconstruction
- Pedestrian Collision Reconstruction
- Traffic Signal Timing Essentials for the Traffic Accident Investigator

Attendance of American Society of Testing and Materials (ASTM) Committee F13 – Pedestrian/Walkway Safety and Footwear meeting (San Diego, CA, 2018)

"SATAI Conference" presented by the *Southwestern Association of Technical Accident Investigators (SATAI)* (Henderson, NV, 2018)
- Heavy Vehicle Event Data Recorders
- Kawasaki Event Data Recorders
- Post-Collision Mechanical Examinations

"Injuries, Anatomy, Biomechanics & Federal Regulation" instructed by *Jeffrey A. Pike/Society of Automotive Engineers* (El Segundo, CA, 2018)

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"46th International Workshop on Human Subjects for Biomechanical Research" presented by *National Highway Traffic Safety Administration* (San Diego, CA, 2018)

- Ongoing Results From Low-Uncertainty Estimates of Single Head Impacts in American Football, Ice Hockey, Lacrosse, and Combat Sports
- Experiments to Evaluate Dummy and Model Biofidelity in Far-Side Impacts in a Realistic Vehicle Environment
- Biofidelity of THOR 5th Female Abdomen in Fixed-Back Belt Pull Tests
- Multi-Body Modeling of the Brain and Cervical Spine: Towards Rapid Injury Prediction and Prevention
- THOR-AV (Autonomous Vehicle) Dummy FE Model Development
- GHBMC M50-O Occupant Response in Moderate-speed Rear Impacts
- Biomechanical Responses of Pediatric Occupants in Non-standard Seating Positions – A Pilot Study Utilizing Human Body Models
- THOR 50M Suitability for Automated Vehicle Crashworthiness
- Restraint Biomechanics in Frontal Impacts With Inboard-Leaning Occupants
- Head Trajectories of Post-Mortem Human Surrogates in Moderate-Speed Rear Impacts
- Global Head and T1 Corridors From Post-Mortem Human Surrogates Frontal Sled Tests
- Biomechanical Response of Post-mortem Human Surrogates Subjected to Impacts From Unmanned Aircraft Systems
- Identifying Field Crash Data Collection Needs for a Pedestrian Crash Avoidance and Crashworthiness Study

"62st STAPP Car Crash Conference" presented by *SAE* (San Diego, CA, 2018)

- Safety in the Coming Decades: Are We Poised to Achieve Total Safety in an Autonomous Vehicle Environment?
- Assessment of Thoracic Response and Injury Risk Using the Hybrid III, THOR-M, and Post-Mortem Human Surrogates under Various Restraint Conditions in Full-Scale Frontal Sled Tests
- The Effects of Inboard Shoulder Belt and Lap Belt Loadings on Chest Deflection
- Reference PMHS Sled Tests to Assess Submarining of the Small Female
- Sources of Variability in Structural Bending Responses to Pediatric and Adult Human Ribs in Dynamic Frontal Impacts
- Quantification of Skeletal and Soft Tissue Contributions to Thoracic Response in a Dynamic Frontal Loading Scenario
- Injury Risk Curves for the Human Cervical Spine from Inferior-to-Superior Loading
- A Reanalysis of Experimental Brain Strain Data: Implication for Finite Element Head Model Validation
- SC – High Speed Biplane X-Ray Head Impact Experiments in the Göttingten Minipig
- Human Shoulder Response to Lateral Impact in Intermediate Loading Conditions between High-Velocity, Short Duration and Low-Velocity, Long Duration
- Side Impact Assessment and Comparison of Appropriate Size and Age Equivalent Porcine Surrogates to Scaled Human Side Impact Response Biofidelity Corridors
- SC – Next Steps for the IIHS Side Crashworthiness Evaluation Program
- Relation Between Sacroilium and Other Pelvic Fractures Based on Real-World Automotive Accidents
- Front Airbag Deployment Rates in Real-World Car Accidents in Japan and Implications for Activation of Accident Emergency Calling System
- SC – Development of Multiple Crash Events to Understand Occupant Behavior and Injury Based on Real-World Accidents
- Driver Assistance and Fully Autonomous Systems: Their Implications on Safety
- Validation of a Finite Element 50th Percentile THOR Anthropomorphic Test Device in Multiple Sled Test Configurations
- SC – Effect of Contact Separation on the Abdominal Response to Impact of a Human Body Model
- SC – Using Human Body Models to Assess Knee Ligament Injury in Knee Hyperextension
- SC – Comparative Responses of the PIPER 6YO Human Body Model and the Q6 ATD for Simulated Frontal and Lateral Impacts
- SC – Human Surrogate Finite Element Models Under Multi-Directional Loading: Applications of Aerospace Data for the Future of Automotive Environments
- Modelling of an Adjustable Generic Simplified Vehicle for Pedestrian Impact and Simulations of Corresponding Reference PMHS Tests Using the GHBMC 50th Percentile Male Pedestrian Simplified Model
- SC – Warrior Injury Assessment Manikin Oblique Vertical Testing
- Analysis of the Frequency and Mechanism of Injury to Warfighters in the Underbody-Blast Environment

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"SATAI Conference" presented by the *Southwestern Association of Technical Accident Investigators (SATAI)* (Glendale, AZ, 2019)

- Nighttime Crashes on Unlit and Lighted Roads
- Driver's Acceleration Behaviors
- Pedestrian Walking Speeds What Numbers to Use?

"63rd STAPP Car Crash Conference" presented by *SAE* (San Antonio, TX, 2019)

- Future Challenges and Needs of Road Safety Impact Protection – A Global Perspective
- Brain Strain from Motion of Sparse Markers
- SC – Machine Learning Based Model for Predicting Head Injury Criterion (HIC)
- Human Response to Injury Resulting from Head Impacts with Unmanned Aircraft Systems
- Development of a Subhuman Primate Brain Finite Element Model to Investigate Brain Injury Thresholds Induced by Head Rotation
- PMHS and WorldSID Kinematic and Injury Response in Far-Side Events in a Vehicle-Based Test Environment
- Far Side Impact Injury Threshold Recommendations Based on 6 Paired WorldSID/Post-Mortem Human Subject Tests
- SC – Investigating Combined Thoracic Loading Using Elderly Female Dummy (EFD)
- A Shoulder Injury Criterion for the EuroSID-2re Applicable in a Large Loading Condition Spectrum of the Military Domain
- Response Ratio Development for Lateral Pendulum Impact with Porcine Thorax and Abdomen Surrogate Equivalents
- Factors Affecting Child Injury Risk in Motor-Vehicle Crashes
- SC – Novel Use of a Halo Orthosis on Pediatric Anthropomorphic Test Devices (ATDs) in Frontal Sled Tests
- Biofidelic Evaluation of the Large Omni-Directional Child Anthropomorphic Test Device in Low-Speed Loading Conditions
- SC – Pediatric Cervical Spine Strength and Stiffness in the Sagittal Plane
- Kinematic and Biomechanical Response of Post-Mortem Human Subjects Under Various Pre-Impact Postures to High-Rate Vertical Loading Conditions
- Analysis of Force Mitigation by Boots in Axial Impacts Using a Lower Leg Finite Element Model
- Assessment of Several THOR Thoracic Injury Criteria Based on a New Post Mortem Human Subject Test Series and Recommendations
- A Novel Approach to Scaling Age-, Sex-, and Body Size-Dependent Thoracic Responses using Structural Properties of Human Ribs
- SC – Volume and Pressure Considerations in Human Body Modeling
- SC – Improvements in Simulations of Aortic Loading by Filling in Voids of the Global Human Body Model
- Evaluating the Effect of Muscle Activation on Head Motion During Non-Injurious Impact in Human Volunteers
- Quantifying Relative Brain Motion in a Post Mortem Human Subject
- A Senor Suite for Toeboard Three-Dimensional Deformation Measurement During Crash
- SC – The Effect of an Acoustic Startling Warning on Take-Over Reaction Time and Trunk Kinematics for Drivers in Autonomous Driving Scenarios
- SC – Passenger Injury Analysis Considering Vehicle Crash after AEB Activation
- SC – An Experimental Confirmation of the Occupant Kinematic Response for Out of Position and Belt Tensioning Effect During Collision Avoidance System
- Pedestrian Detection During Vehicle Backing Maneuvers Using Ultrasound Parking Sensors

"SATAI Conference" presented by *Southwest Association of Technical Accident Investigators (SATAI)* (Glendale, AZ, 2020)

- Electric Scooters
- E-Scooter vs. Car Crash Test
- CDR System Operators / Analysis & Applications Course Series – The CDR 900 Interface and Toyota TechStream / PCS & VCH Data
- iNPUT-ACE Traffic Seminar

"U.S. Access Board for a Virtual Celebration of the ADA" (virtual conference, 2020)

- The World Before the ADA: "The ADA: Breaking Discriminatory and Societal Barriers for People with Disabilities"
- Achievements of the ADA: A discussion with Judy Heumann
- "How the ADA Has Advanced Accessible Design", a presentation by Karen Braitmayer, FAIA

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"48th NHTSA Workshop – Human Subjects for Biomechanical Research" (virtual conference, 2020)
- Comparison of Hybrid III and THOR in Recline Frontal Sled Tests without a Knee Bolster
- A Novel Methodology to Examine Occupant Motion During the AEB Pulses Present in the Modern Fleet
- Evaluation of Thoracic Injury Risk for the Hybrid III and THOR-M 50th Percentile Male ATDs in the Rear Seat during NCAP Severity Sled Tests with Comparisons to the Front Seat
- Evaluation of Submarining for the Hybrid III and THOR-50M in the Rear Seat during Frontal Crash Sled Tests
- THOR-AV Biofidelity Evaluation
- Proposed Lumbar Lij Injury Assessment Reference Value
- Compressive Material Properties of Human Rib Trabecular Bone
- Assessment for a Perfusion Method for Detecting Soft Tissue Injuries in a Cadaveric Model
- THOR-05F Matched-Pair Tests in a Generic Automotive Environment
- Updates on THOR-05F and THOR-AV-05F Dummy FE Model Development
- Integration and Validation of a Deformable Spine into a Simplified Human Body Model
- A Parametric Active Human Model for Simulating Occupant Responses in Abrupt Vehicle Maneuvers
- Applicability of Neck Injury Criteria Critical Intercepts for Human Body Finite Element Models
- Deep Learning Model for Predicting Head Kinematics
- Lumbar Spine and Pelvis Injury and Response on Oblique-facing Aircraft Seat – A Preliminary Computational Study
- Deep Learning Head Model for Entire Brain Deformation Calculation in Real-time for Concussions
- The Effect of Active Head Restraints (AHRs) on Head Kinematics in Rear Impact Sled Tests
- Injury Comparison Between 5th Percentile Female and 50th Percentile Male Simplified GHBMC Models in Various Frontal Impact Scenarios

"Advanced HVE: Parts I & II" virtual *HVE* Forum presented by *Anthony D. Cornetto, P.E., President* (virtual conference, 2021)

Attendance of American Society of Testing and Materials (ASTM) Committee F13 – Pedestrian/Walkway Safety and Footwear meeting (virtual conference, 2021)

Attendance of American Society of Testing and Materials (ASTM) Committee F13 – Pedestrian/Walkway Safety and Footwear meeting (virtual conference, 2022)

"SATAI Conference" presented by *Southwest Association of Technical Accident Investigators (SATAI)* (Glendale, AZ, 2022)
- Member of the "Crash Crew" for instrumented crash testing
- Human Factors – nighttime visibility
- Human Factors – retroreflectivity

Society of Automotive Engineers World Congress Experience (Detroit, MI, 2022)

"SATAI Conference" presented by *Southwest Association of Technical Accident Investigators (SATAI)* (Glendale, AZ, 2023)
- Member of the "Crash Crew" for instrumented crash testing
- Vehicle System Forensics
- Forensic Photography
- Video Speed analysis Using iNPUT-ACE

"Motorcycle Collision Reconstruction" presented by *Lightpoint Learning* (Westlake Village, CA [virtual instruction], 2023)

"SATAI Conference" presented by *Southwest Association of Technical Accident Investigators (SATAI)* (Glendale, AZ, 2023)
- ADAS Age
- Tire Forensics

"67th STAPP Car Crash Conference" presented by *SAE* (Ann Harbor, MI, 2023)
- Comparison of Adult Female and Male PMHS Pelvis and Lumbar Response to Underbody Blast
- Driving Behavior during Left-Turn Maneuvers at Intersections on Left-Hand Traffic Roads
- Evaluation of DAMAGE Algorithm in Frontal Crashes
- Examination of Crash Injury Risk as a Function of Occupant Demographics
- Frontal-Crash Occupant Protection in the Rear Seat: Submarining and Abdomen/Pelvis Response in Midsized Male Surrogates

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- Investigation of THOR-AV 5F Biofidelity in Sled Test Conditions with a Semi-Rigid Seat
- Machine-Learning-Accelerated Simulations for the Design of Airbag Constrained by Obstacles at Rest
- Standardized Assessment of Gravity Settling Human Body Models for Virtual Testing
- Calibration of Kinematic Simulations of Pedestrian Injury Using Field Data
- Comparison of Chinese and German in-depth accident data of pedestrian thorax and head injuries
- Development of proactive anti-whiplash system through a combined computational and experimental approach
- Development of 'Relax Seat: Passenger Protection Airbag'
- Evaluation of the Thoracic Response of Male Post Mortem Human Surrogates in the Rear Seat during Frontal Impacts
- Exploring Heart Strain from Blunt Trauma through a Parametric Investigation of Real-World Commotio Cordis Cases
- Low-Rate Ankle Stiffness in Human Volunteers
- Numerical investigations on the factors affecting thorax injuries in vehicle vs pedestrian accidents
- Seated Posture of Occupants in Wheelchairs
- Sex-Based Differences in Calcaneal Fracture Tolerance under High-Rate Axial Loading
- Statistical estimation of the difference of two time-histories
- Thoracic Response of the Hybrid III and THOR Small Female ATDs in Matched Frontal Sled Tests

"SATAI Conference" presented by *Southwest Association of Technical Accident Investigators (SATAI)* (Glendale, AZ, 2024)

- Member of the "Crash Crew" for instrumented crash testing
- 3D Technologies for Crash Scene Documentation
- Motorcycle Reconstruction Topics,
- Digital Forensics,
- The Biomechanics of Motorcycle Helmets

## RESEARCH

March 2023 – Performed and participated in rear-end, frontal, side-swipe, door-contact, angled, and "debris" impacts, in addition to pedestrian dummy impacts, involving a 2012 Ford Escape, 2012 Mazda 5, 2006 Chevrolet Impala, 2013 Subaru Outback, 2008 Ford Focus, and 2012 Honda Civic with instrumented volunteers, a Hybrid III ATD, and a BioRID ATD in Glendale, AZ.

February 2022 – Performed and participated in rear-end, frontal, angled and offset impacts, in addition to pedestrian dummy impacts, involving a 2013 Subaru Outback, 2006 Chevrolet Impala, 2007 Chevrolet Impala, 2005 Toyota Corolla, 2002 Honda Civic, 2012 Honda Civic, with instrumented volunteers and a Hybrid III ATD in Glendale, AZ.

January 2021 – Performed and participated in rear-end, angled, and frontal impacts between a 2015 Hyundai Elantra and a 2015 Chevrolet Sonic with instrumented Hybrid III ATDs in Glendale, AZ.

January 2020 – Performed and participated in rear-end impacts between a 2012 Hyundai Genesis Coupe and a 1999 BMW 528i with instrumented volunteers in Glendale, AZ.

January 2019 – Performed and participated in rear-end impacts between an Impala and Grand Marquis with instrumented volunteers in Glendale, AZ.

January 2019 – Performed and participated in instrumented remote driven broad-side rollover collision between a Tahoe and Grand Marquis, a multiple vehicle rear-end impact with a Town car, motorcycle and Prius, and yaw testing with a Suburban in Glendale, AZ.

June 2018 – Performed and participated in instrumented car-to-car rear-end impacts with human subject using 2005 to 2007 Toyota Camrys and Corollas in Las Vegas, NV.

March 2018 – Performed and participated in instrumented oblique lateral minor impacts involving human female subjects and instrumented Hybrid III ATDs at angles of 45º, 60º, and 90º using 2005 to 2007 Toyota Camrys and Corollas in Las Vegas, NV.

January 2018 – Performed and participated in instrumented Ford Mustang head-on to a Chevrolet Impala with instrumented humans; Chevrolet Impala rear-ending Ford mustang with instrumented humans; Chevrolet Impala side-swiping, oblique side-impact, and offset rear-end impact into a Ford Mustang with instrumented humans; Chevrolet Malibu into child pedestrian dummy; Chevrolet Tahoe into child pedestrian dummy atop a bicycle; Ford Mustang rear-ending Chevrolet

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Tahoe with hitch with instrumented humans; and Chevrolet Malibu rear-ending Chevrolet Tahoe with hitch with instrumented humans in Glendale, AZ.

October 2016 – Performed and participated in instrumented license plate-to-bumper car-to-car rear-end impacts with a human subject using Civics and a Celica in Mesa, AZ.

October 2016 – Performed and participated in instrumented steering wheel and brake force, vehicle pitch, and bumper height change tests during hard braking using a Celica in Mesa, AZ.

October 2016 – Performed and participated in instrumented remote driven Celica into an angled head-on with a Ranger, and Massive Moving Barrier to Oldsmobile 98 and Expedition with child safety seat restrained 3-year-old dummies in Glendale, AZ.

January 2016 – Performed and participated in instrumented Scion xB to Transit Connect rear-end impacts with DriveCams equipped, in Las Vegas, NV.

September 2015 – Performed and participated in instrumented Focus and Ram 1500 to pedestrian dummy, Crown Victoria to Focus side-swipe, and Ram 1500 head-on to a Prelude impacts with an instrumented human and Hybrid III dummy in Glendale, AZ.

November 2011 – Performed and participated in vehicle-to-vehicle offset rear-end impacts with instrumented human occupants with a Chrysler LeBaron, Kia Sephia, Plymouth Sundance, and Ford F-150 in Las Vegas, NV.

May 2011 – Performed and participated in hitch-to-wheel impacts with an instrumented human occupant with a Chevrolet Suburban into a Toyota Celica in Las Vegas, NV.

January 2024 – Performed and participated in vehicle-to-vehicle rear-end/frontal impacts with instrumented human occupants and ATDs within a Kia Rio and Toyota Corolla

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