

ALEX J. KAZMIERCZAK, MS, ACTAR

Managing Forensic Expert
Accident Reconstruction and Biomechanics

OFFICE: 562.368.4232
EMAIL: alex.kazmierczak@aperturellc.com

EDUCATION

MS	Master of Science in Engineering Management Biomedical Engineering Specialization University of California, Irvine, 2018
BS	Bachelor of Science in Biomedical Engineering Biomechanics Concentration University of Rochester, 2017

EMPLOYMENT HISTORY

July 2018 – Present

Aperture, LLC – Long Beach, CA, *December 2021 – Present*
(Formerly Biomechanical Research and Testing, LLC, *July 2018 – December 2021*)
Managing Forensic Expert – Accident Reconstruction and Biomechanics
(Forensic Expert – Accident Reconstruction and Biomechanics, *December 2021 – December 2024*)

Responsible for the investigation and analysis of injury-causing events, which includes vehicle and site inspections, accident reconstruction, and necessary biomechanical engineering calculations. Conducts ongoing research to evaluate the biomechanics, human kinematic response, and injury potential of vehicular accident and other activities. Performs fully instrumented tests utilizing human subjects and/or human surrogates. Data collected and analyzed include accelerations, velocities, displacements, forces, high speed film/video, and vehicle crush and dynamics. Has received training on the retrieval and analysis of data from automobile event data recorders (EDR). Conducts biomechanical and accident reconstruction analyses and provides forensic consultation for automobile accidents and various events for purposes of litigation, including accident reconstruction, occupant kinematics, occupant force exposure, and injury potential.

ACCREDITATIONS AND CERTIFICATIONS

2024	Society of Automotive Engineers (SAE) *Accident Reconstruction Certificate – Professional Development Program*
2023	Accreditation Commission for Traffic Accident Reconstruction (ACTAR) *Traffic Accident Reconstructionist – ACTAR #4639*
2021	iNPUT-ACE (Now Axon Investigate) – Long Beach, CA *Operator (IAOC), Examiner (IAEC), & Metrologist (IAMC) Certifications*
2019	Collision Safety Institute, Inc. – Long Beach, CA *Crash Data Retrieval (CDR) Technician*

NOT FOR EXPERT DESIGNATION

PUBLICATIONS

Kazmierczak, A., Umale, S., Visalli, A., Webb, E. et al., "*Aggregation of Cervical Loads in Rear Impact Crash Tests and Comparison to Activities of Daily Living*," SAE Technical Paper 2025-01-8708, 2025, doi:10.4271/2025-01-8708.

Kashdan, A., Umale, S., Kazmierczak, A., Kasselik, J. et al., "*Aggregation of Lumbar Loads in Rear Impact Crash Tests*," SAE Technical Paper 2023-01-0647, 2023, doi:10.4271/2023-01-0647.

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

PRESENTATIONS

"*Accident Reconstruction & Biomechanics 101*," presented to the Whittier Bar Association, La Habra, California, October 23, 2025.

"*Aggregation of Cervical Loads in Rear Impact Crash Tests and Comparison to Activities of Daily Living*," SAE Paper 2025-01-8708, presented in the Occupant Protection: Rear Impact, Side Impact, Rollover, and Biomechanics technical session of the 2025 SAE World Congress Conference, Detroit, Michigan, April 8, 2025.

Southwestern Assoc. of Technical Accident Investigators (SATAI) 2022 Crash Test Data Presentation – Glendale, Arizona, February 2022.

MEMBERSHIPS

California Association of Accident Reconstruction Specialists (*CA²RS*)

Society of Automotive Engineers (SAE)

Southwestern Association of Technical Accident Investigators (SATAI)

CONTINUING EDUCATION AND TRAINING

May 2026 — *PC-Crash Training On-Demand – Online*
Topics included: "My First Project", "Vehicle Control", "Collisions", "Looking at the Results", "Intro to Animation."

Feb. 2026 — *California Association of Accident Reconstruction Specialists (CA²RS), 1st Quarter Training, "'Things' on Crush – Applicability, Accuracy, Special Situations" – Irvine, CA*
Topics included: Comparison of speed from crush calculation methods with instrumentation data in several crash tests; NHTSA crash test data; Crush, energy analysis, and momentum methods.

Aug. 2025 — *National Association of Professional Accident Reconstruction Specialists (NAPARS), "Head and Brain Injuries in Auto vs. Cyclist Accidents" – Online*
Topics included: Collision kinematics and vehicle interaction; Head and brain injuries in cycling; Mechanism of injury; Helmet assessment and capabilities.

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Apr. 2025 *National Association of Professional Accident Reconstruction Specialists (NAPARS), 2025 Symposium on EDR Research and Training – Newport Beach, CA*
Topics included: Recent Past, Present, and Future of the Bosch; The Effects of Power Loss on Toyota TSS Data; Toyota Safety Sense and Pre-Collision System; HVEDR Update and Heavy Truck Collision Mitigation; Electronic Data Case Studies; Polarity & Delta-V Magnitude from Speed Data; ADAS, Self-Driving Vehicles, and A/R; Compare EDR Data with CrashScan Data; CDR Analysis and Applications Update; Using Ignition Cycles and Odometer Values to Identify EDR Events, and Electronic Data Available from BMW Motorcycles; Calculating Lateral Displacement from Yaw Rate; Alternative Motorcycle Data Sources; EDR Lateral Delta-V Accuracy in IIHS Side-Impact Tests.

Apr. 2025 *The Society of Automotive Engineers (SAE) 2025 World Congress Conference & Exhibition – Detroit, MI*
Topics included: Analysis and Comparison of Metrics to Assess Submarining Behavior with the Hybrid III 5th Percentile Dummy in the Rear Seat; Occupant Responses in High-Speed Rear Sled Tests: Focus of Initial Position, Seat Strength and ATD Design; Biofidelity Assessment of the GHBMC M50-O Seated in a Honda Accord Seat; The Biomechanical Effects of Neck and Back Cushion / Pillow / Support Devices in Low-Speed Rear Impacts; Aggregation of Cervical Loads in Rear Impact Crash Tests and Comparison to Activities of Daily Living; Overview of Seat Design Changes and Performance; A Chronology of Research and Events to-Date Significant to Occupant Protection in Rear-End Automobile Impacts; Assessment of Injuries in Rear Impacts, Protecting Head Injury Criterion in Rear-World Frontal Impacts; Sensitivity Analysis of Virtual Crash Simulation Software Using Design of Experiments; Validation of Pedestrian Collision Reconstruction Using the PC-Crash Multibody Pedestrian Model; Quantifying the Uncertainty in Bicycle-Computer Speed Measurements; An Introduction and Evaluation of Apple iOS Device Data for Use in Crash Reconstruction; FIT File Processing for Accident Reconstruction; Bicycle Pitch-Over Reconstruction Analysis; A Comparison of UAV LiDAR and Terrestrial Laser Scanner Accuracies; Accuracy of Mobile Phone LiDAR on Crashed Vehicles; A Method for Lens Distortion Correction of Algorithmically Altered Images; Evaluation of Several Tesla Dashcam Angles for Model 3 and Y Via Reverse Project Photogrammetry.

Mar. 2025 *Engineering Dynamics Corporation (EDC), HVE Forum – Savannah, GA*
Topics included: Discussions and hands-on examples of *HVE*'s most sophisticated problem-solving techniques with a focus on its new features; an overview of EDC's *SIMON* vehicle simulation model; the theory of *DyMESH* and its applications to real-world 3-dimensional collision and rollover simulation events; capabilities and functions of *HVE*'s Video Creator.

Oct. 2024 *Society of Automotive Engineers (SAE), "Applying Automotive EDR Data to Traffic Crash Reconstruction" – Marina Del Rey, CA*
Topics included: EDR data limitations; calculating speed at impact from recorded pre-crash speed; apply data to inline rear end, head on, and angular collisions; reconcile EDR data with other physical evidence and combine to narrow speed ranges; use time-distance and overlay EDR data on scene maps/diagrams to show where critical driving inputs were made.

Mar. 2024 *Society of Automotive Engineers (SAE), "Vehicle Crash Reconstruction: Principles and Technology" – Marina Del Rey, CA*
Topics included: The reconstruction process as it gets applied to various crash types – in-line and intersection collisions, pedestrian collisions, motorcycle crashes, rollover crashes, and heavy truck crashes; Methods of evidence documentation; Analysis methods for electronic data from event data recorders and for video; Photogrammetry, simulation, and uncertainty analysis.

Dec. 2023 *Society of Automotive Engineers (SAE), "Photography for Accident Reconstruction, Product Liability, and Testing" – Irvine, CA*
Topics included: Producing a complete and meaningful photographic record of any project, accident, or testing, ascertaining how to use various photographic equipment and when/why to use it, and developing a consistent methodology for post-processing and distribution of images.

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Nov. 2023 *Society of Automotive Engineers (SAE), "Driver Distraction from Electronic Devices: Insights and Implications" – Online*
Topics included: Recognizing the differences between various forms of distraction (cognitive, auditory, visual, manual) and the current state of driver distraction research.

Oct. 2023 *How to Model Crush Using Photos Online Course (Lightpoint Data) – Online*
Topics included: Hands-on training detailing the concepts and methods for modeling crush using scene or appraisal photographs when the vehicle is no longer available for inspection.

Aug. 2023 *California Association of Accident Reconstruction Specialists (CA²RS) – Online*
Topics included: Introduction to 3D Video Reconstruction. The use of 2D video to create a 3D reconstruction for crash investigation.

Mar. 2023 *Southwestern Association of Technical Accident Investigators (SATAI) – Glendale, AZ*
Topics included: Vehicle System Forensics; EDR Updates; Forensic Photography; Vehicle Speed Analysis Using iNPUT-ACE.

Dec. 2022 *Society of Automotive Engineers (SAE), "The Fundamentals of Vehicle Dynamics" – Online*
Topics included: Vehicle performance and behavior as it pertains to wheel loads, acceleration, braking, road loads, ride performance, cornering and handling, suspension, steering, and the mechanics of a rollover.

Oct. 2022 *Simcenter Madymo Introduction – Signal Hill, CA*
Topics included: Madymo user interface, multibody systems and models, joint simulation, seat belt modeling and simulation, vehicle seat material characteristics, ATD positioning, FE modeling, contact definitions, airbag modeling, biomechanical data analysis, data visualization.

Mar. 2022 *ai2-3D Forensics "Zero to Hero in CloudCompare" Course – Online*
Topics included: Editing point clouds, combining, filtering, transforming, registering and animating 3D data using CloudCompare.

Feb. 2022 *Southwestern Association of Technical Accident Investigators (SATAI) – Glendale, AZ*
Topics included: Complex visibility analysis and recreation, perception-response times, object detection and human perception presented by Jeff Suway, JS Forensics; Pedestrian and collision avoidance safety systems; Toyota Safety Sense and Lexus Safety Systems; Time-distance-velocity analysis from forward facing vehicle mounted cameras presented by Tim Reust from Accident Science Inc.; Laser scanning data acquisition systems, 3D data processing, photogrammetry, videogrammetry presented by Lightpoint Scientific.

Nov. 2021 *iNPUT-ACE Calculating Speed from Video Course – Online*
Topics included calculating accurate timing from video using the iNPUT-ACE Variable Frame Rate (VFR) Lightboard and understanding how to utilize recorded video while acknowledging the challenges that can complicate these calculations, such as variable refresh rates, compression, rolling shutter, and more. Additionally, an introduction to HEX to help understand the basic building blocks of video files and how different codecs read the metadata that can create inaccuracies in older methods of calculating speed. The second of two courses as part of iNPUT-ACE's Metrologist Certification.

May 2021 *iNPUT-ACE Reverse Projection: Camera Match Overlay Course – Online*
Topics included utilizing video evidence to overlay on top of point cloud data allowing for accurate measurements and calculations within a documented margin of error. Additionally, gaining the ability to measure object locations through Reverse Projection and 3D laser scan geometry. The first of two courses as part of iNPUT-ACE's Metrologist Certification.

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Apr. 2021 *iNPUT-ACE Examiner Certification Courses – Online*
Prepares students with specific skills for performing higher-level video investigations with our advanced tools and workflows. The certification track includes two, 4-hour courses including "Workflows and Technical Considerations" and "Narrative Reports and Demonstratives." Learned how to adjust frame rates, understand compression and incorporate filters and advanced processes. Students will develop the ability to resize and deinterlace video while preparing workflows and understanding how to properly use enhancement techniques on video evidence. Building on the previous course work, students will learn how to compile demonstrative reports to include embedded Sub Clips, Marked Images, and descriptions specifically for sharing information between investigators, prosecutors and when testifying in court.

Mar. 2021 *iNPUT-ACE Operator Certification Courses – Online*
Prepares students with the fundamental knowledge and skills that are essential for performing accurate video investigations. The certification track includes two, 4-hour courses including "Intro to iNPUT-ACE" and "Case Management." Exposes students to the latest techniques and methodologies used to accurately interrogate and process digital multimedia evidence for the purpose of furthering a criminal investigation. Students are directed through the processes of recovering valuable evidence from video images using the software solution: iNPUT-ACE. Case Management builds on the Intro to iNPUT-ACE content by exposing students to advanced techniques and methodologies used to accurately interrogate and process digital multimedia evidence. Students will learn how to perform in-depth investigations using the built-in tools inside iNPUT-ACE.

Dec. 2020 *California Association of Accident Reconstruction Specialists (CA²RS) – Online*
Topics included: An overview of collision reconstruction/investigation using crash event data. Case studies, use of Toyota vehicle control history and freeze frame data, and Advanced Driver-Assist Systems (ADAS) were discussed.

May-Aug. 2020 *Event Data Recorder Analysis in Traffic Crash Reconstruction (Ruth Consulting) – Online*
The premise of this continuing education class was to start from the 24 hour SAE EDR class covering generic Delta V, generic Pre-crash Data analysis, and manufacturer specifics all model years and models, then customize the class considering the prior experience in EDR of the students by trimming out 4 hours of older GM and older Ford specifics that were already well known by the attendees (Class was limited to employees of Biomechanical Research and Testing (BRT), Western Analysis (Jason Arst), and JS Forensics (Jeff Suway)). Days and start times were determined by organizer Jason Arst polling the attendees. Class was taught on Zoom and each participant except Arst was visible to the instructor.

Jun. 2020 *Society of Automotive Engineers (SAE) WCX Digital Summit – Online*
Topics included: Video analysis and photogrammetry, rear seat occupant safety, ADAS localization and sensing, accident reconstruction in an ADAS future, and human factors in seating comfort.

Jun. 2020 *iNPUT-ACE Video Evidence Training Symposium – Online*
Training from leading video and law enforcement experts on the latest investigative techniques and technologies to expedite video-centric casework. Topics included: Calculating accurate timing from video, legal issues related to video admissibility, DVR evidence recovery, video evidence and photogrammetry, and Photoshop in the video analysis workflow.

Feb. 2020 *California Association of Accident Reconstruction Specialists (CA²RS) – Glendora, CA*
Topics included: Photography and video for reconstructionists and investigators, including photogrammetry, photomodeling, drones and alternative camera capture.

Feb. 2020 *PhotoModeler Technologies – Signal Hill, CA*
Four-day training course on use of PhotoModeler for Collision Reconstruction. Topics included: An intro to the PhotoModeler interface, planning and photography, troubleshooting, camera calibration, utilizing scan data with photographs in PhotoModeler, and proper techniques with taking photographs of vehicles for use in PhotoModeler.

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Jan. 2020 *Southwestern Assoc. of Technical Accident Investigators, Winter Meeting – Glendale, AZ*
Topics included: Toyota Safety Sense and Vehicle Control History, performance characteristics of electric scooters used by Bird, Lime, Jump, Lyft and others, and utilizing video evidence in traffic investigations (iNPUT-ACE).

Nov. 2019 *Engineering Dynamics Corporation (EDC), Simulations Training – Miami, FL*
Topics included: Reinforcing the understanding of how the *EDSMAC, EDSMAC4, EDSVS*, and *EDVTS* programs operate, including relevant calculation procedures, tire models, and the anatomy of simulations.

Oct. 2019 *Society of Automotive Engineers (SAE), "Injuries, Anatomy, Biomechanics, & Federal Regulation" – Glendale, CA*
Topics included: Recognizing the significance of various injuries, impact and deceleration injuries for various body regions, as well as the different measuring capabilities of various test dummies including Hybrid III test dummies.

Aug. 2019 *Calif. Assoc. of Accident Reconstruction Specialists (CA²RS), 3rd Quarter Training – Glendora, CA*
Topics included: forensic testing and analysis of seatbelts with corresponding case studies.

Jan. 2019 *Southwestern Assoc. of Technical Accident Investigators, Winter Meeting– Glendale, AZ*
Topics included: human factors of acceleration, lane changes and backing, as well as nighttime visibility.

Nov. 2018 *CDR Technician Training – Long Beach, CA*
Topics included: using the Bosch Crash Data Retrieval (CDR) Tool to image the Event Data Recorder (EDR) of vehicles using both the DLC and Direct-to-Module (D2M) methods, and the resources available to correctly identify which adapters need to be used for a given vehicle.

Nov. 2018 *DTS Principles of Dynamic Data Collection – Seal Beach, CA*
Topics included: data collection techniques using DTS data acquisition systems (DAS), how these systems can be used in the fields of injury biomechanics and automotive crash, as well as the implementation of these systems in anthropomorphic test devices (ATDs).

Oct. 2018 *FARO Laser Scanner Training – Los Angeles, CA*
Topics included: set up and implementation of FARO laser scanners for scanning accident scenes and the vehicles involved, as well as the registration of scans in *Scene* to facilitate the accident reconstruction and engineering analysis process.

RESEARCH AND TESTING

Mar. 2023 Performed and participated in a series of six instrumented low speed rear-end impacts between a bullet Honda Civic and a target Ford Focus, with instrumented human driver and 50th percentile male Hybrid III and BioRID ATDs in the target vehicle and three human occupants in the bullet vehicle. Performed and participated in official SATAI conference crash tests utilizing instrumented vehicles, human volunteers, and ATDs, which included: a lane change side-swipe between a Subaru Outback and a Mazda 5; a T-swipe between a Subaru Outback front bumper and Mazda 5 side; a narrow offset angled collision between the right front of a Mazda 5 and the left front of a Subaru Outback; an impact between the right front of a Subaru Outback and the partially open Mazda 5 driver's door. Vehicle dynamics, vehicle damage, EDR data, and human/dummy occupants motions/loading were documented and analyzed. Pre and post full-body MRI scans were conducted on the instrumented human driver in the low speed rear-end tests. All tests were performed in Glendale, AZ.

Results presented at SATAI Conference, March 1-4, 2023, Glendale, AZ

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Feb. 2022	Performed and participated in front-to-barrier, rear-to-barrier, and rear end impacts with instrumented volunteers using a Civic and Outback and rear-end impacts using Impalas and an angled broadside between an Impala and Corolla with volunteers and an ATD in Glendale, AZ. *All tests were performed as part of the SATAI Crash Conference.*
Jan. 2020	Performed and participated in a series of high-speed (50-60 mph) impacts between an instrumented BMW 528i and miscellaneous objects (mattress, ladder, pallet, bicycle, couch). Occupants included an instrumented human driver, an instrumented ATD, and an un-instrumented left rear passenger. Two 30-mph impacts between an instrumented BMW 528i with human driver and ATD occupants and electric scooters with a standing dummy positioned on it. The scooter/dummy was struck from the side and from the rear. A remote-driven high-speed oblique head-on collision between an instrumented Lincoln Navigator and a stationary BMW 528i with an instrumented ATD in the front passenger seat. *All tests were performed in Glendale, AZ as part of the SATAI Crash Conference.*
Jan. 2020	Performed and participated in a series of instrumented low speed rear-end impacts between a bullet BMW 528i and a target 2012 Hyundai Genesis, with instrumented ATD (left rear) and human occupant (driver) in the BMW and human occupant (driver) in the Hyundai. Five tests were conducted with impact speeds ranging from 7 to 10 mph. *All tests were performed in Glendale, AZ.*
Jan. 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 Towncar, motorcycle, and Prius, and yaw testing with a Suburban in Glendale, AZ. *Results presented at SATAI conference, January 2019, Glendale, AZ.*
Jan. 2019	Performed and participated in rear-end impacts between an Impala and Grand Marquis with instrumented volunteers in Glendale, AZ.

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