



Résumé of
WILLIAM M. BORTLES, B.S.M.E.

Kineticcorp™

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EXPERIENCE:

Principal Accident Reconstructionist (Current Position):
Kineticcorp, LLC, Greenwood Village, CO. 2005 to Present.
Project Engineer: Atlantic Industrial Technologies, Inc., Islandia, NY. 2004 to 2005.

EDUCATION:

Bachelor of Science. Mechanical Engineering, University of Colorado at Boulder. 2002.
Graduate Certificate. Digital Forensics. Capella University. 2019.

CERTIFICATIONS:

Accreditation Commission for Traffic Accident Reconstruction (ACTAR): Full Accreditation #2257
Crash Data Retrieval (CDR) System®, Technician, Data Analyst, Technician Mentor/Trainer
Remote Pilot, Small Unmanned Aircraft System Rating, Federal Aviation Administration (FAA)
Cellebrite Certified Operator (CCO), Cellebrite Certified Physical Analyst (CCPA)

ACCIDENT RECONSTRUCTION & DIGITAL FORENSICS: Mr. Bortles has investigated and reconstructed hundreds of accidents. Through this work and research within the field of accident reconstruction and digital forensics, he has gained experience in the following areas:

- Mr. Bortles investigates and reconstructs accidents involving pedestrians, bicycles, motorcycles, off-highway vehicles, industrial equipment, passenger cars, buses, commercial vehicles, and articulated tractor-trailer combinations. Mr. Bortles reconstructs single vehicle loss-of-control and rollover accidents. He reconstructs accidents involving post-collision fires. He also reconstructs vehicular accidents involving wildlife, roadside barriers, and terrain features.
- Mr. Bortles investigates and reconstructs accidents involving passenger and freight trains. He has received training the National Transportation Safety Board (NTSB) specific to rail accidents.
- Mr. Bortles is a certified Bosch Crash Data Retrieval (CDR) System® Technician, Data Analyst and Technician Mentor/Trainer. He is experienced in the retrieval and analysis of data from rollover sensors, restraint and powertrain control modules from passenger vehicles and light trucks. Mr. Bortles has trained others to become certified Level 1 and 2 CDR Technicians.
- Mr. Bortles is experienced in accessing, recovering, and interpreting data from commercial vehicle Event Data Recorders (EDRs) and Engine Control Modules (ECMs). He has received training from the University of Tulsa's *How to Interpret Commercial Vehicle Event Data Recorders*, *The Digital Forensics of Heavy Vehicle Event Data Recorders* and the Society of Automotive Engineers' *Accessing and Interpreting Heavy Vehicle Event Data Recorders* courses.
- Mr. Bortles inspects heavy truck systems, including air brake systems, to determine their condition and relevance to an accident. He has completed Commercial Vehicle Safety Alliance (CVSA) seminars for *Brake Certification* as well as *Out of Service Criteria* presented by the Colorado Motor Carriers Association.
- Mr. Bortles applies his knowledge of human factors to accident investigations. He has received training in *Human Factors in Traffic Crashes – Analysis of Driver's Responses* and has attended presentations at the Human Factors in Driver Vision and Lighting sessions of the SAE World Congress. He has performed numerous visibility studies (both daytime and nighttime) including headlight mapping and visibility studies, sun glare studies, and conspicuity studies.
- Mr. Bortles performs data acquisitions and analyses of cellular telephones and other mobile devices. He relies upon his education related to Digital Forensics and he has earned the *Cellebrite Mobile Forensics Fundamentals*, *Cellebrite Certified Operator* and *Cellebrite Certified Physical Analyst* credentials. He is also trained and experienced in performing data acquisitions from vehicle infotainment, navigation, and telematics systems.
- Mr. Bortles is an active researcher and author. He has published numerous peer-reviewed research studies on topics such as event data recorders, vehicle-to-vehicle crashes, crash-test analysis, acoustics, vehicle dynamics, vehicle system forensics, and 3D visualization and modeling techniques. Several of Mr. Bortles' papers have been selected to appear in *Advances and Current Practices in Mobility: SAE International Conference Proceedings*; "SAE's new online journal celebrating the very best papers from our events." Mr. Bortles also serves as a peer-reviewer for research papers submitted to the Occupant Protection: Accident Reconstruction, Integrated Safety Systems and Event Data Recorders sessions. Mr. Bortles is a member of the SAE's *Crash Data Collection and Archiving Committee*. This committee is responsible for developing and maintaining SAE standards, recommended practices and informational reports related to safety-relevant data.

PROJECT & AUTOMOTIVE ENGINEERING: At Atlantic Industrial Technologies, Mr. Bortles designed and oversaw production of numerous custom hydraulic and pneumatic systems, controls and power transmission equipment for use in industrial, infrastructure, military and entertainment applications. During his undergraduate studies at the University of Colorado at Boulder, Mr. Bortles participated in the SAE Collegiate Design Series as a member of CU's Mini Baja® team. He designed the chassis and roll cage of the off-road vehicle, fabricated components, assisted in the testing the vehicle and competed as a driver during the endurance race at the Mini Baja® West regional competition.

PROFESSIONAL AFFILIATIONS: National Association of Professional Accident Reconstruction Specialists (NAPARS), Society of Automotive Engineers (SAE), Southwestern Association of Technical Accident Investigators (SATAI).

Last Revised: May 12, 2021

William M. Bortles, B.S.M.E.

Principal Accident Reconstructionist

Kineticorp™

Publications

1. Rose, Nathan, Carter, N., Randolph, M., **Bortles, W.**, “Motorcycle Accident Reconstruction: Incorporating EDR Data from the Struck Vehicle,” *Collision: The International Compendium of Crash Research*, Volume 13, Issue 2. Fall 2019.
2. Rose, Nathan., **Bortles, W.**, Carter, N., “Motorcycle Accident Reconstruction: Applicable Error Rates for Struck Vehicle EDR-Reported ΔV ,” *Collision: The International Compendium of Crash Research*, Volume 13, Issue 1. Spring 2019.
3. **Bortles, William**, Daniel Koch, Gray Beauchamp, David Pentecost, George S. Rayburn, Ryan Hostetler, “Event Data Recorder Performance During High Speed Yaw Testing Subsequent to a Simulated Tire Tread Separation Event,” Technical Paper Number 2019-01-0634, Society of Automotive Engineers, Warrendale, PA, 2019.
*This paper was selected to appear in *Advances and Current Practices in Mobility: SAE International Conference Proceedings*, an online journal celebrating the best papers from the SAE World Congress.
4. **Bortles, William**, Ryan Hostetler, “Performance of Event Data Recorders Found in Toyota Airbag Control Modules in High Severity Frontal Oblique Offset Crash Tests,” Technical Paper Number 2019-01-0633, Society of Automotive Engineers, Warrendale, PA, 2019.
5. Beauchamp, Gray, David Pentecost, Daniel Koch, **William Bortles**, “Speed Analysis of Yawing Passenger Vehicles Following Tire Tread Detachment,” Technical Paper Number 2019-01-0418, Society of Automotive Engineers, Warrendale, PA, 2019.
*This paper was selected to appear in *Advances and Current Practices in Mobility: SAE International Conference Proceedings*, an online journal celebrating the best papers from the SAE World Congress.
6. **Bortles, William**, Sean McDonough, Connor Smith, Michael Stogsdill, “An Introduction to the Forensic Acquisition of Passenger Vehicle Infotainment & Telematics Systems Data,” Technical Paper Number 2017-01-1437, Society of Automotive Engineers, Warrendale, PA, 2017.
7. **Bortles, William**, David Hessel, William Neale, “Application of 3D Visualization in Modeling Wheel Stud Contact Patterns with Rotating and Stationary Surfaces,” Technical Paper Number 2017-01-1414, Society of Automotive Engineers, Warrendale, PA, 2017.
8. **Bortles, William**, Wayne Biever, Neal Carter, Connor Smith, “A Compendium of Passenger Vehicle Event Data Recorder Literature and Analysis of Validation Studies,” Technical Paper Number 2016-01-1497, Society of Automotive Engineers, Warrendale, PA, 2016.
9. Beauchamp, Gray, Dana Thornton, **William Bortles** Nathan Rose, “Tire Mark Striations: Sensitivity and Uncertainty Analysis” Technical Paper Number 2016-01-1468, Society of Automotive Engineers, Warrendale, PA, 2016.
10. **Bortles, Will**, Neale, William T.C., “The Misunderstood Witness – Event Data Recorders for Heavy Vehicles,” *American Bar Association – Tort Trial & Insurance Practice Section, Automobile Law Committee News*, Spring 2013.
11. Rose, Nathan A., Neal Carter, David Pentecost, Tilo Voitel, **William Bortles**, “Using Data from a DriveCam Event Recorder to Reconstruct a Vehicle-to-Vehicle Impact,” Technical Paper Number 2013-01-0778, Society of Automotive Engineers, Warrendale, PA, 2013.
12. **Bortles, Will**, Neale, William T.C., “Automotive Event Data Recorders: Ushering in a New Era of Accident Reconstruction,” *American Bar Association – Tort Trial & Insurance Practice Section, Automobile Law Committee News*, Summer 2012.
13. Neale, William T.C., Terpstra, Toby, **Bortles William. M.**, “Evaluation of Discrete Vehicle Accident Sounds for use in Accident Reconstruction.” *Proceedings of Meetings on Acoustics*, Vol. 5 (2008).
14. Neale, William T.C., Terpstra, Toby, **Bortles William. M.**, “Analysis of Commonly Witnessed Vehicle Accident Sounds *in situ*.” *The Journal of the Acoustical Society of America* Vol. 124:4, (Oct. 2008): 5aNS5.
15. Rose, Nathan A., Beauchamp, Gray, **Bortles, Will**, “Quantifying the Uncertainty in the Coefficient of Restitution Obtained with Accelerometer Data from a Crash Test.” Technical Paper 2007-01-0730, Society of Automotive Engineers, Warrendale, PA, 2007.

Committee Publications

16. Society of Automotive Engineers: Data Collection and Archiving Standards Committee. **William Bortles**: Sponsor/Task-Force Leader, SAE J1674_201807 “Early Acquisition and Preservation of Information in a Motor Vehicle Crash.” July 2018 Revision, Warrendale, PA, 2018.

Acknowledged Research and Forensic Testing

Mr. Bortles has conducted crash testing of EDR supported vehicles in car-to-car and car-to-pedestrian crash tests. He has also conducted forensic testing of passenger vehicle, heavy truck and motorcycle dynamics, tire disablements and acoustics. That testing includes:

1. High speed tire disablement testing involving full and partial tread separations, Bennett, CO.
 - o Published by Gray Beauchamp, et al. "A Comparison of 25 High Speed Tire Disablements Involving Full and Partial Tread Separations" Technical Paper 2013-01-0776, Society of Automotive Engineers, Warrendale, PA, 2013.
2. CDR supported vehicle car-to-pedestrian crash testing, Longmont, CO.
 - o Presented at the 2011 ARC-CSI Crash Conference by Patrick Cillo.
3. Denver Police Department C.V.P.I. directional control and yaw testing, Denver, CO.
 - o Published by Gray Beauchamp, et al. "Determining Vehicle Steering and Braking from Yaw Striations," Technical Paper 2009-01-0092, Society of Automotive Engineers, Warrendale, PA, 2009.
4. Restitution Modeling for Crush Analysis
 - o Published by Nathan A. Rose, et al. "Restitution Modeling for Crush Analysis: Theory and Validation," Technical Paper 2006-01-0908, Society of Automotive Engineers, Warrendale, PA, 2006.

Invited Lectures & Technical Seminars Instructed

1. "Event Data Recorder Performance During High Speed Yaw Testing Subsequent to a Simulated Tire Tread Separation Event," Technical Paper Number 2019-01-0634, Society of Automotive Engineers Word Congress Experience, Detroit, MI, April 11, 2019.
2. "Performance of Event Data Recorders Found in Toyota Airbag Control Modules in High Severity Frontal Oblique Offset Crash Tests," Technical Paper Number 2019-01-0633, Society of Automotive Engineers Word Congress Experience, Detroit, MI, April 11, 2019.
3. "Investigating Crash and Vehicular Crimes Using 21st Century Techniques: Event Data Recorders and Modern Digital Forensics," Informational Session, Colorado School of Mines, Denver, CO, April 19, 2018.
4. "Effectively Conveying Accident Reconstruction and Biomechanical Concepts," American Bar Association – Tort Trial & Insurance Practice Section, 2018 Emerging Issues in Motor Vehicle Product Liability Litigation, Phoenix, AZ, April 4, 2018.
5. "An Introduction to the Forensic Acquisition of Passenger Vehicle Infotainment & Telematics Systems Data," Technical Paper Number 2017-01-1437, Society of Automotive Engineers Word Congress Experience, Detroit, MI, April 5, 2017.
6. "Application of 3D Visualization in Modeling Wheel Stud Contact Patterns with Rotating and Stationary Surfaces," Technical Paper Number 2017-01-1414, Society of Automotive Engineers Word Congress Experience, Detroit, MI, April 4, 2017.
7. "A Compendium of Passenger Vehicle Event Data Recorder Literature and Analysis of Validation Studies," Technical Paper Number 2016-01-1497, Society of Automotive Engineers Word Congress, Detroit, MI, April 14, 2016.
8. "Entertainer, Navigator and Historian: Vehicle Data – Forensic Retrieval and Privacy/Data Ownership Issues," American Bar Association – Tort Trial & Insurance Practice Section, 2016 Emerging Issues in Motor Vehicle Product Liability Litigation, Phoenix, AZ, April 7, 2016.
9. "What You Need to Know about Event Data Recorders," Webinar: Washington Defense Trial Lawyers, June 28, 2013.
10. "Heavy Truck Accidents: Preserving Electronic Event Data," Colorado Motor Carriers – Safety Management Council Meeting, June 6, 2013.
11. "Event Data Recorder 101 – An Introduction and Application of Data," For Credit Continuing Education Webinar Offered by Kineticcorp, May 3, 2013.
12. "Event Data Recorder 101 – An Introduction and Application of Data," For Credit Continuing Education Webinar Offered by Kineticcorp, March 15, 2013.
13. "The Evolution of the Event Data Recorder." Guest Lecturer. Biomechanical Engineering Department, Wayne State University, Detroit, MI, April 12, 2011.
14. *Bosch Crash Data Retrieval (CDR) System[®] Technician Level 1 & Level 2 Certification Course.* Instructor. Kineticcorp, Greenwood Village, CO, March 8, 2011.

Training, Technical Conferences and Seminars Attended

1. *iVe v3.2 Release Webinar*. Berla Corporation, Virtual. May 12, 2021.
2. *Cellebrite Certified Physical Analyst* (Online), January 24, 2021.
3. *Cellebrite Mobile Forensics Fundamentals* (test out examination), January 24, 2021.
4. *Cellebrite Certified Operator*, Cellebrite (Online), January 9, 2021.
5. *iVe v3.1 Release Webinar*. Berla Corporation, Virtual. December 2, 2020.
6. *Using Freightliner New Cascadia ECM Data in Accident Reconstruction*. National Association of Professional Accident Reconstruction Specialists (NAPARS) Joint Conference 2020, Virtual. October 13, 2020.
7. *On-Track Safety Training*. Regional Transportation District. May 4, 2020.
8. *2020 EDR Summit*. Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. March 9-11, 2020.
9. *Accident Investigation Orientation for Rail Professionals*. National Transportation Safety Board, The George Washington University Virginia Campus, Sterling, VA. May 29-30, 2019.
10. *Forklift Safety – Basic*. OSHAcademy, Occupational Safety & Health Training. May 21, 2019.
11. *Society of Automotive Engineers World Congress Experience*. Accident Reconstruction Session, Event Data Recorders Session, Human Factors in Driver Vision and Lighting Session, Detroit, MI, April 9-11, 2019.
12. *2019 EDR Summit*. Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. March 4-6, 2019.
13. *Bosch Crash Data Retrieval (CDR) System® Technician Train the Trainer Certification*. Collision Safety Institute, Houston, TX. March 3, 2019.
14. *Human Factors in Traffic Crashes – Analysis of Driver’s Responses*. Presented by Jeffrey W. Muttart, Ph.D., Crash Safety Solutions, LLC., Sponsored by the Southwestern Association of Technical Accident Investigators, Phoenix, AZ. January 20-24, 2019.
15. *2018 EDR Summit*. Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. March 5-7, 2018.
16. *Society of Automotive Engineers World Congress Experience*. Accident Reconstruction Session, Event Data Recorders Session Detroit, MI. April 4-5, 2017.
17. *2017 EDR Summit*. Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. March 6-8, 2017.
18. *The Digital Forensics of Heavy Vehicle Event Data Recorders*, University of Tulsa – Continuing Engineering & Science Education, Tulsa, OK. February 14-16, 2017.
19. *Society of Automotive Engineers Word Congress*: Accident Reconstruction Session, Event Data Recorders Session, Detroit, MI. April 13-14, 2016.
20. *2016 CDR User’s Summit*. Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. January 25-27, 2016.
21. *Vehicle System Forensics*. Berla Corporation, San Jose, CA. September 28 – October 1, 2015.
22. *2015 CDR User’s Summit*. Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. January 26-28, 2015.
23. *Acquiring and Analyzing Data from Sensors and In-Vehicle Networks Seminar*, Society of Automotive Engineers, Troy, MI. October 23-24, 2014.
24. *Society of Automotive Engineers World Congress*. SAE, Detroit, MI, April 9, 2014.
25. *2014 CDR User’s Summit*. Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. January 27-29, 2014.
26. *Applying Automotive EDR Data to Traffic Crash Reconstructions*. Society of Automotive Engineers, Norwalk, CA. December 10-12, 2013.
27. *Bosch Crash Data Retrieval (CDR) System® Technician Train the Trainer Certification*. Collision Safety Institute, Houston, TX. January 20, 2013.
28. *Accessing and Interpreting Heavy Vehicle Event Data Recorders*. Society of Automotive Engineers, Oxnard, CA. October 22-26, 2012.
29. *Heavy Vehicle Crash Reconstruction*. Northwestern University – Center for Public Safety, Evanston, IL. May 14-18, 2012.
30. *2012 CDR User’s Summit*. Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. January 16-18, 2012.
31. *Motorcycle Safety Foundation – Basic Rider Course*. T3RG Motorcycle Schools, Aurora, CO. September 10-11, 2011.
32. *Society of Automotive Engineers World Congress*. SAE, Detroit, MI, April 12-13, 2011.

33. *Bosch Crash Data Retrieval (CDR) System[®] Technician Train the Trainer Certification*. Collision Safety Institute, Houston, TX, January 20-21, 2011.
34. *2011 CDR User's Summit*. Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. January 17-19, 2011.
35. *How to Interpret Commercial Vehicle Event Data Recorders (EDRs)*, University of Tulsa – Continuing Engineering & Science Education, Tulsa, OK. November 15-19, 2010.
36. *The ATV Safety Institute E-Course*, ATV Safety Institute, September 9, 2010.
37. *2010 CDR User's Summit*, Crash Data Group/Collision Publishing & Collision Safety Institute, Houston, TX. January 25-27, 2010.
38. *CVSA Out of Service Seminar*, Colorado Motor Carriers Association, Denver, CO. August 27, 2009.
39. *Bosch Crash Data Retrieval (CDR) System[®] Analyst Course*, Collision Safety Institute, Golden, CO. December 9-12, 2008.
40. *Bosch Crash Data Retrieval (CDR) System[®] Technician Course*, Collision Safety Institute, Golden, CO. December 8, 2008.
41. *Tire Mechanics & Modeling*, Colorado State University – Race Vehicle Dynamics Laboratory (presented by Dr. Patrick Fitzhorn, Director), Denver, CO. March 20, 2008.
42. *2008 HVE Forum*, Engineering Dynamics Corporation, San Diego, CA. February 18-22, 2008.
43. *Active Safety Technology: Paving the Road to Accident-Free Driving Telephone/Webcast*, National Highway Traffic Safety Administration (NHTSA), March 1, 2007.
44. *CarSim 7 Training*, Mechanical Simulation Corporation (Presented by Thomas Gillespie). December 13, 2006.
45. *CVSA Brake Certification Seminar*, Colorado Motor Carriers Association, Denver, CO. July 27, 2006.
46. *Chassis & Suspension Component Design for Passenger Cars & Light Trucks Seminar*, Society of Automotive Engineers, Troy, MI. July 24-26, 2006.