

# NATHAN ROSE

720.839.1995  
nathan@explico.com

## TRAFFIC ACCIDENT RECONSTRUCTION

### EDUCATION

UNIVERSITY OF COLORADO, DENVER  
MS, Mechanical Engineering, 2003

COLORADO SCHOOL OF MINES  
BS, Engineering, Civil Specialty, 1998

### LICENSES & CERTIFICATIONS

Accreditation Commission for Traffic  
Accident Reconstruction (ACTAR #2265)

### AFFILIATIONS

Society of Automotive Engineers

## PROFESSIONAL PROFILE

*Mr. Nathan Rose is a Principal Accident Reconstructionist at Explico. He has been an accident reconstructionist since 1998 and has been a founding member of two accident reconstruction firms (Kineticorp and Luminous Forensics). He holds a bachelor's degree in engineering with a civil specialty from the Colorado School of Mines (1998) and a master's degree in mechanical engineering from the University of Colorado at Denver (2003). Nathan is accredited as a traffic accident reconstructionist by the Accreditation Commission for Traffic Accident Reconstruction (ACTAR), and he has offered expert testimony as a reconstructionist in courts around the United States. During his graduate studies, Nathan specialized in dynamics and impact mechanics, and he has published numerous technical articles, reports, and books related to vehicular accident reconstruction. His books are titled Motorcycle Accident Reconstruction and Rollover Accident Reconstruction, both published by the Society of Automotive Engineers. Nathan holds a motorcycle endorsement in the the State of Colorado, and he has completed the Motorcycle Safety Foundation's Basic and Advanced RiderCourses and their Street Strategies course.*

## AREAS OF EXPERTISE

Vehicular Accident Reconstruction  
Crash Simulation  
Roadside Barrier Impact Reconstruction  
EDR/HVEDR Data Analysis  
Video Analysis

---

## EXPERIENCE

---

### Explico

2022 - Present      *Principal Accident Reconstructionist*

### Luminous Forensics, LLC

2019 - 2021      *Principal Accident Reconstructionist*

### Kineticorp, LLC

2005 - 2019      *Director, Principal Accident Reconstructionist*

### Knott Laboratory

2003 - 2005      *Senior Engineer*

1998 - 2003      *Engineer*

### Koechlein Consulting Engineers

1996 - 1997      *Field Engineer*

---

## AWARDS AND HONORS

---

SAE Master Instructor, Society of Automotive Engineers, 2023

Ben Franklin Award - Silver Medal, Independent Book Publishers Association, 2019

Arch T. Colwell Merit Award, Society of Automotive Engineers, 2006

---

## BOOKS AND CHAPTERS

---

1. "Reconstruction of Vehicular Rollover Accidents," contributing author to Chapter 5 in Vehicle Accident Analysis and Reconstruction Methods, 3rd Edition, by R. Matthew Brach, Raymond M. Brach, and James J. Mason, SAE International, 2022.

2. Rose, Nathan A., Motorcycle Accident Reconstruction, Second Edition, Society of Automotive Engineers, 2022.

3. Rose, Nathan A., Neal Carter, David Pentecost, Alireza Hashemian, "Video Analysis of Motorcycle and Rider Dynamics During High-Side Falls," Chapter 13 in Collision Reconstruction Methodologies Volume 4: Motorcycle Accident Reconstruction, Edited by Chris Armstrong, PT-186\_4, SAE International, 2019.

4. Carter, Neal, Rose, Nathan A., Pentecost, David, "Validation of Equations for Motorcycle and Rider Lean on a Curve," Chapter 9 in Collision Reconstruction Methodologies Volume 4: Motorcycle Accident Reconstruction, Edited by Chris Armstrong, PT-186\_4, SAE International, 2019.

5. Rose, Nathan, Neale, William, Motorcycle Accident Reconstruction, Society of Automotive Engineers, ISBN 978-0-7680-9507-4, 2019, <https://www.sae.org/publications/books/content/r-483/>.
6. Rose, Nathan A., Beauchamp, Gray, Asay, Alan F., Rollover Accident Reconstruction, Society of Automotive Engineers, ISBN 978-0-07680-9372-8, 2019, <https://www.sae.org/publications/books/content/r-475/>.

## PEER-REVIEWED PUBLICATIONS AND REPORTS

---

1. Rose, N.A., Smith, C., Carter, N., Metanias, A., "Validation of Pedestrian Collision Reconstruction Using the PC-Crash Multibody Pedestrian Model," SAE Technical Paper 2025-01-8681, doi:10.4271/2025-01-8681.
2. Rose, N.A., Palmer, J., Smith, C., et al., "Validation of the PC-Crash Single-Track Vehicle Driver Model for Simulating Motorcycle Motion," *SAE Technical Paper 2024-01-2475*, 2024, <https://doi.org/10.4271/2024-01-2475>.
3. Rose, N., Palmer, J., Smith, C., Carter, N., et al., "Decelerations of Capsized Motorcycles – An Update," SAE Technical Paper 2022-01-0823, 2022, <https://doi.org/10.4271/2022-01-0823>.
4. Rose, Nathan A., Carter, N., "An Examination of Equations Relating Motorcycle Impact Speed to Struck Vehicle Post-Impact Rotational Displacement," SAE Technical Paper 2021-01-0895, *SAE International Journal of Advances and Current Practices in Mobility*, 2021, <https://doi.org/10.4271/2021-01-0895>.
5. Rose, Nathan, Carter, N., Neale, W., and McKelvey, N., "Braking and Swerving Capabilities of Three-Wheeled Motorcycles," SAE Technical Paper 2019-01-0413, 2019, <https://doi.org/10.4271/2019-01-0413>.
6. Bailey, Ann; Funk, James; Lesley, David; Sherwood, Chris; Crandall, Jeff; Neale, William; Rose, Nathan, "Validation of a Videogrammetry Technique for Analysing American Football Helmet Kinematics," *Sports Biomechanics*, <https://doi.org/10.1080/14763141.2018.1513059>, October 2, 2018.
7. Rose, Nathan A., Neal Carter, "An Analytical Review and Extension of Two Decades of Research Related to PC-Cash Simulation Software," Society of Automotive Engineers (SAE) Technical Paper Number 2018-01-0523, April 2018.
8. Rose, Nathan A., Neal Carter, Connor Smith, "Further Validation of Equations for Motorcycle Lean on a Curve," *SAE Int. J. Trans. Safety*, 6(3): 173-191, Paper Number 2018-01-0529, 2018.
9. Rose, Nathan, "Fracture Energy Calculations for Wooden Utility Poles," *Collision: The International Compendium of Crash Research*, Volume 12, Issue 1, 2017.
10. Rose, Nathan, Neal Carter, David Pentecost, Alireza Hashemian, "Video Analysis of Motorcycle and Rider Dynamics During High-Side Falls," Society of Automotive Engineers Paper Number 2017-01-1413.
11. Rose, Nathan A., Carter, Neal, Beauchamp, Gray, "The Accelerations Present during the Trip Phase of a Soil-Tripped Rollover Crash – An Update," *Collision: The International Compendium for Crash Research*, Volume 11, Issue 2, 2016.

12. Rose, Nathan, Neal Carter, "The Longevity of Scene Evidence from a Rollover — A Case Study," *Collision: The International Compendium for Crash Research*, Volume 11, Issue 2, 2016.
13. Rose, Nathan, Neal Carter, John Kreisher, Martin Randolph, William Neale, David Danaher, "How Accurate Are Witness Distance Estimates Given in Car Lengths?," *Collision: The International Compendium for Crash Research*, Volume 11, issue 1, 2016.
14. Rose, Nathan A., Carter, Neal, "The Accelerations Present during the Trip Phase of a Soil-Tripped Rollover Crash," *Collision: The International Compendium for Crash Research*, Volume 11, Issue 1, 2016.
15. Rose, Nathan A., Neal Carter, Gray Beauchamp, "Post-Impact Dynamics for Vehicles with a High Yaw Velocity," SAE Technical Paper Number 2016-01-1470, doi:10.4271/2016-10-1470.
16. Beauchamp, G., Thornton, D., Bortles, W., and Rose, Nathan A., "Tire Mark Striations: Sensitivity and Uncertainty Analysis," SAE Int. J. Trans. Safety 4(1): 134-150, 2016, doi:10.4271/2016/01-1468.
17. Beauchamp, G., Pentecost, D., Koch, D., and Rose, Nathan A., "The Relationship Between Tire Mark Striations and Tire Forces," SAE Int. J. Trans. Safety 4(1): 134-150, 2016, doi:10.4271/2016-01-1479.
18. Carter, N., Hashemian, A., Rose, Nathan A., and Neale, W., "Evaluation of the Accuracy of Image Based Scanning as a Basis for Photogrammetric Reconstruction of Physical Evidence," SAE Technical Paper 2016-01-1467, 2016, doi:10.4271/2016-01-1467.
19. Carter, Neal, Nathan A. Rose, David Pentecost, "Validation of Equations for Motorcycle and Rider Lean on a Curve," SAE Int. J. Trans. Safety 3(2):2015, doi:10.4271/2015-01-1422.
20. Rose, Nathan A., Neal Carter, "Further Assessment of the Uncertainty of CRASH3  $\Delta V$  and Energy Loss Calculations," Paper Number 2014-01-0477, Society of Automotive Engineers, April 2014.
21. Rose, Nathan A., Neal Carter, David Pentecost, "Vehicle Acceleration Modeling in PC-Crash," Paper Number 2014-01-0464, Society of Automotive Engineers, April 2014.
22. 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," Paper Number 2013-01-0778, Society of Automotive Engineers, April 2013.
23. Carter, Neal, Gray Beauchamp, Nathan A. Rose, "Comparison of Calculated Speeds for a Yawing and Braking Vehicle to Full-Scale Vehicle Tests," Paper Number 2012-01-0620, Society of Automotive Engineers, 2012.
24. Rose, Nathan A., Beauchamp, Gray, "Development of a Variable Deceleration Rate Approach to Rollover Crash Reconstruction," Paper Number 2009-01-0093, Society of Automotive Engineers, 2009, published in the SAE International Journal of Passenger Cars - Mechanical Systems 2(1):308-332.

25. Rose, Nathan A., Beauchamp, Gray, "Analysis of a Dolly Rollover with PC-Crash," Paper Number 2009-01-0822, Society of Automotive Engineers, 2009.
26. Beauchamp, Gray, Hessel, David, Rose, Nathan A., "Determining Steering and Braking Levels from Yaw Mark Striations," Paper Number 2009-01-0092, Society of Automotive Engineers, 2009, published in the SAE International Journal of Passenger Cars - Mechanical Systems 2(1):291-307.
27. Rose, Nathan A., Beauchamp, Gray, "The Influence of Vehicle-to-Ground Impact Conditions on Rollover Dynamics and Severity," Paper Number 2008-01-0194, Society of Automotive Engineers, 2008.
28. Rose, Nathan A., "Analysis of Vehicle-to-Ground Impacts during a Rollover with an Impulse-Momentum Impact Model," SAE Int. J. Passeng. Cars - Mech. Sys. 1(1):105-123 (SAE Paper Number 2008-01-0178), 2008.
29. Rose, Nathan A., Neale, W.T.C., Hessel, D., McCoy, R.W., Chou, C.C., "A Method of Quantify Vehicle Dynamics and Deformation for Vehicle Rollover Tests Using Camera-Matching Video Analysis," SAE Int. J. Passeng. Cars - Mech. Sys. 1(1):301-317 (SAE Paper Number 2008-01-0350), 2008.
30. Funk, J.R., Beauchamp, G., Rose, Nathan A., Pierce, J., "Occupant Ejection Trajectories in Rollover Crashes: Full-Scale Testing and Real World Cases," SAE Int. J. Passeng. Cars - Mech. Sys. 1(1):43-54 (SAE Paper Number 2008-01-0166), 2008.
31. Rose, Nathan A, Beauchamp, Gray, "Factors Influencing Roof-to-Ground Impact Severity: Video Analysis and Analytical Modeling," 2007-01-0726, Society of Automotive Engineers, 2007.
32. Rose, Nathan A., Beauchamp, Gray, Bortles, Will, "Quantifying the Uncertainty in the Coefficient of Restitution Obtained with Accelerometer Data from a Crash Test," 2007-01-0730, Society of Automotive Engineers, 2007.
33. Rose, Nathan A., Beauchamp, gray, "Restitution Modeling for Crush Analysis: Theory and Validation," 2006-01-0908, Society of Automotive Engineers, 2006.
34. Chou, C., McCoy, R., Neale, W., Rose, Nathan, "Image Analysis of Rollover Crash Test Using Photogrammetry," 2006-01-0723, Society of Automotive Engineers, 2006. This paper received the 2006 Arch T. Colwell Merit Award, which was established by Arch Colwell to recognize authors of outstanding papers presented at SAE meetings. Papers are judged for their value as contributions to existing knowledge of mobility engineering, and primarily with respect to their value as an original contribution to the subject matter.
35. Rose, Nathan A., "Crush and Conservation of Energy Analysis: Toward a Consistent Methodology," 2005-01-1200, Society of Automotive Engineers, Warrendale, PA, 2005.
36. Rose, Nathan A., "An Examination of the CRASH3 Effective Mass Concept," 2004-01-1181, Society of Automotive Engineers, Warrendale, PA, 2004.

37. Neale, W., McFadden, S., Rose, Nathan A., "A Video Tracking Photogrammetry Technique to Survey Roadways for Accident Reconstruction," 2004-01-1221, Society of Automotive Engineers, Warrendale, PA, 2004.
38. Rose, Nathan A., "An Examination of the Effective Mass Concept for Eccentric Motor Vehicle Impacts in the CRASH3 Algorithm," Master's Thesis, University of Colorado - Denver, Spring, 2003.
39. Rose, Nathan A., Hughes, Christopher M., "Integrating Monte Carlo Simulation, Momentum-Based Impact Modeling, and Restitution Data to Analyze Crash Severity," 2001-01-3347, Society of Automotive Engineers, Warrendale, PA, 2001.
40. Fenton, S.J., Neale, W.T.C., Rose, Nathan A., Hughes, Christopher, "Determining Crash Data Using Camera-Matching Photogrammetric Technique," 2001-01-3313, Society of Automotive Engineers, Warrendale, PA, 2001.
41. Fenton, S.J., Johnson, Wendy, LaRocque, Jaime, Rose, Nathan A., "Using Digital Photogrammetry to Determine Vehicle Crush and Equivalent Barrier Speed," 1999-01-0439, Society of Automotive Engineers, Inc., Warrendale, PA, 1999.

## TECHNICAL ARTICLES AND REPORTS

---

1. Rose, Nathan, "Braking Capabilities of Motorcyclists — An Update," *Impact: The Journal of the Institute of Traffic Accident Investigators*, Volume 29 No.1, Summer 2021.
2. Rose, Nathan, Bortles, W., Carter, N., "Motorcycle Accident Reconstruction: Applicable Error Rates for Struck Vehicle EDR-Reported  $\Delta V$ ," *Collision: The International Compendium of Crash Research*, Volume 13, Issue 1(2019).
3. 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 (2019).
4. Rose, Nathan A., Grimes, Wes, "Vehicle Crash Reconstruction: Principles and Technology," Course Notes for Society of Automotive Engineers Course C1728.
5. Peck, Louis, Deyerl, Eric, Rose, Nathan, "The Effect of Tire Pressure on the Deceleration of a Motorcycle Under Application of the Rear Brake Only," *Accident Reconstruction Journal*, July/August 2017.
6. Carter, N., Rose, N., "Validation of Equations for Motorcycle and Rider Lean on a Curve," *Impact: The Journal of the Institute of Traffic Accident Investigators*, 24(1), Autumn 2016.
7. Carter, Neal, Rose, Nathan, "The Role of Vehicle Crash Data Recorders in a Motor Vehicle Safety Program," *Electric Energy*, Summer 2015.
8. Rose, Nathan A., "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Course Notes for Society of Automotive Engineers Course C1502.

9. Rose, Nathan A., Neal Carter, David Pentecost, "Analysis of Motorcycle and Rider Limits on a Curve," *Collision: The International Compendium for Crash Research*, Volume 9, Issue 1.
10. Rose, Nathan A., Neale William T.C., Carter, Neal, "Using Data from a DriveCam Video Event Recorder to Reconstruct a Hard Braking Event," *Collision: The International Compendium for Crash Research*, Volume 7, Issue 1, Spring 2012.
11. Rose, Nathan A., Beauchamp, Gray, "A Variable Deceleration Rate Approach to Rollover Crash Reconstruction," *Collision: The International Compendium for Crash Research*, Volume 5, Issue 1, Spring 2010.
12. Rose, Nathan A., Hughes, Christopher M., "Optimum Chord Length for Critical Speed Analysis," *Accident Investigation Quarterly*, Summer 2002.
13. Fenton, S.J., Rose, Nathan A., Johnson, Wendy, "Using Digital Photogrammetry to Determine Crash Severity," Proceedings of the International Crashworthiness Conference, September 2000.

## FUNDED RESEARCH

---

1. "Video Analysis of Concussion Causing Events in Professional Football," funded by Biocore LLC, 2016-2017.
2. "Video Analysis of Concussion Causing Events in Professional Football - A Pilot Study," funded, in part, by the National Football League, 2015.
3. "Using Data from a DriveCam Event Recorder to Reconstruct a Vehicle-to-Vehicle Impact," funded, in part, by DriveCam - The Driver Science Company, 2012-13.
4. "Using Data from a DriveCam Video Event Recorder to Reconstruct a Hard Braking Event," funded, in part, by DriveCam - The Driver Science Company, 2011-12.
5. "A Method to Quantify Vehicle Dynamics and Deformation for Vehicle Rollover Tests Using Camera-Matching Video Analysis," funded, in part, by Ford Motor Company, 2007.
6. "Image Analysis of Rollover Crash Test Using Photogrammetry," funded, in part, by Ford Motor Company, 2005-06.

## PRESENTATIONS AND COURSES TAUGHT

---

1. "Motorcycle Accident Reconstruction for Lawyers" Colorado Defense Lawyers Association, 1 Hour, Accredited Continuing Education Webinar, May 2, 2024.
2. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineer Course C1728, 3-day accident reconstruction course taught October 2-4, 2023, Denver, CO.
3. "A Case Study Introduction to Motorcycle Accident Reconstruction," Law Tigers Summit, Scottsdale, AZ, February 20, 2023.



4. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineer Course C1728, 3-day accident reconstruction course taught October 4-6, 2022, Austin, TX.
5. "Avoiding Hindsight Bias When Evaluating Motorcycle Collisions at Intersections," SAE Accident Reconstruction Digital Summit, March 30, 2022.
6. "An Examination of Equations Relating Motorcycle Impact Speed to Struck Vehicle Post-Impact Roational Displacement," SAE Technical Paper 2021-01-0895, Presented at the SAE WCX Digital Summit, April 13-15, 2021.
7. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineers Course C128, 3-day accident reconstruction course taught February 17-19, 2020, Phoenix, AZ.
8. "Multimedia and the Modern Juror," Association of Southern California Defense Counsel (ASCDC) 59th Annual Seminar, Presentation and Panel Discussion, Los Angeles, California, January 30, 2020.
9. "Applying Automotive EDR Data to Motorcycle Accident Reconstruction," Motorcycle Crash Investigation Seminar, Illinois Association of Technical Accident Investigators (IATAI), October 8, 2019, Springfield, IL.
10. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineers Course C1728, 3-day accident reconstruction course taught August 5-7, 2019, Denver, CO.
11. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineers Course C1728, 3-day accident reconstruction course taught April 22-24, 2019, Phoenix, AZ.
12. "Motorcycle Accident Reconstruction: Using the Struck Vehicle EDR Data," EDR Summit, 1-hour presentation, March 6, 2019, Houston, TX.
13. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineers Course C1728, 3-day accident reconstruction course taught November 5-7, 2018, Phoenix, AZ.
14. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineers Course C1728, 3-day accident reconstruction course taught August 6-8, 2018, Herndon, VA.
15. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineers Course C1728, 3-day accident reconstruction course taught June 26-28, 2018, Aberdeen Proving Grounds, Maryland.
16. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineers Course C1728, 3-day accident reconstruction course taught April 23-25, 2018, El Segundo, CA.
17. "Vehicle Crash Reconstruction: Principles and Technology," Society of Automotive Engineers Course C1728, 3-day accident reconstruction course taught December 5-7, 2017, Phoenix, Arizona.
18. "Video Reconstruction Validation of Concussion Causing Events in Professional Football," NFL Head, Neck, and Spine Engineering Subcommittee Meeting at the NFL Scouting Combine, Indianapolis, IN, March 1, 2017.
19. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, 8-hour course taught on December 1, 2016, Cerritos College, California.



20. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, 8-hour course taught on September 27, 2016, Scottsdale, Arizona.
21. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, 8-hour course taught on April 15, 2016 at the Society of Automotive Engineers World Congress, Detroit, Michigan.
22. "Post-Impact Dynamics for Vehicles with a High Yaw Velocity," SAE Technical Paper Presentation, 2016 Society of Automotive Engineers World Congress, Detroit, Michigan, April 14, 2016.
23. "Video Analysis of Concussion Causing Events in Professional Football – A Pilot Study," NFL Head, Neck, and Spine Engineering Subcommittee Meeting at the NFL Scouting Combine, Indianapolis, IN, February 24, 2016.
24. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, 8-hour course taught on November 6, 2015.
25. "How to Develop, Use, and Effectively Present Accident Reconstruction Evidence in Trial," Summer Conference for the Colorado Defense Lawyers Association, Steamboat Springs, CO, August 1, 2015.
26. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, 8-hour course taught on April 24, 2015.
27. "Operator Error and Liability in Motorcycle Accidents," Summer Conference for the Colorado Defense Lawyers Association, Telluride, CO, July 26, 2014.
28. "Hidden Witnesses – Technologies that Reveal Commonly Overlooked Evidence," 1 Hour, Educational Seminar, Denver, CO, June 25, 2014. [Topics Covered: Laser Scanning, Computer Modeling and Simulation, Full-Scale Vehicle Testing, Event Data Recorders, and Animation]
29. "Motorcycle and Trucks – Accident Reconstruction," Invited Presentation, Caltrans Tort Workshop, Oakland, CA, May 29, 2014.
30. "Vehicle Acceleration Modeling in PC-Crash," SAE Technical Paper Presentation, 2014 Society of Automotive Engineers World Congress, Detroit, Michigan, April 9, 2014.
31. "Hidden Witnesses – Technologies that Reveal Commonly Overlooked Evidence," 1 Hour, Educational Seminar, San Diego, CA, March 11, 2014. [Topics Covered: Vehicle Interactions with Center Median Barriers, Computer Modeling and Simulation, Event Data Recorders, Full-Scale Vehicle Testing, and Animation]
32. "Hidden Witnesses – Technologies that Reveal Commonly Overlooked Evidence," 1 Hour, Educational Seminar, Westminster, CO, March 4, 2014. [Topics Covered: Laser Scanning, Computer Modeling and Simulation, Low-Speed Collision Analysis, Event Data Recorders, and Animation]
33. "Hidden Witnesses – Technologies that Reveal Commonly Overlooked Evidence," 1 Hour, Educational Seminar, Englewood, CO, March 3, 2014. [Topics Covered: Laser Scanning, Computer Modeling and Simulation, Low Speed Collision Analysis, Event Data Recorders, and Animation]

34. "Hidden Witnesses – Technologies that Reveal Commonly Overlooked Evidence," 1 Hour, Educational Seminar, Los Angeles, CA, January 15, 2014. [Topics Covered: Vehicle Interactions with Center Median Barriers, Computer Modeling and Simulation, Event Data Recorders, Full-Scale Vehicle Testing, and Animation]
35. "How In-Vehicle Video Systems Are Changing the Face of Litigation," 1 Hour, Continuing Education Webinar, October 24, 2013.
36. "How In-Vehicle Video Systems Are Changing the Face of Litigation," 1/2 Hour, Invited, Educational Webinar Offered by DriveCam, September 19, 2013.
37. "Hidden Witness – Technologies that Reveal Commonly Overlooked Evidence," 1 Hour, Educational Seminar, Seattle, Washington, September 5, 2013. [Topics Covered: Vehicle Acceleration Capabilities, Full-Scale Vehicle Testing, Computer Simulation, Event Data Recorders, Laser Scanning, Computer Modeling, and Animation]
38. "Hidden Witness – Technologies that Reveal Commonly Overlooked Evidence," 1 Hour, Continuing Education Seminar, Denver, Colorado, September 6, 2013.
39. "Driver Distraction and Attention," 1 Hour, Continuing Education Webinar, June 14, 2013.
40. "Accident Reconstruction for DOT Cases," Invited Presentation, Colorado Department of Law, Civil Litigation and Employment Law Section, Denver, CO, June 7, 2013. [Topics Covered: Photogrammetry, Tire Mark Types and Analysis, Computer Simulation, Full-Scale Vehicle Testing, Event Data Recorders, and Animation]
41. "Overlooked Evidence – Giving a Voice to Hidden Evidence," Invited Presentation, Washington State Attorney General's Office - Torts Division, Tumwater, WA, June 4, 2013. [Topics Covered: 3D Laser Scanning, Computer Simulation, Full-Scale Vehicle Testing, and Event Data Recorders]
42. "Recon 201 – More Concepts and Techniques in Accident Reconstruction," 1 Hour, Continuing Education Webinar, May 24, 2013. [Topics Covered: Driver Perception-Response Time, 3D Laser Scanning and Computer Simulation]
43. "Recon 201 – More Concepts and Techniques in Accident Reconstruction," 1 Hour, Continuing Education Webinar, April 5, 2013. [Topics Covered: Driver Perception-Response Time and Heavy Truck Event Data Recorders]
44. "Recon 101 – Concepts and Techniques in Accident Reconstruction," 1 Hour, Accredited Continuing Education Webinar, March 1, 2013. [Topics Covered: Scene Documentation, Photogrammetry, Tire Mark Analysis, Simulation, Rollover Analysis, On-Board Video and Data Recorders, Conservation of Momentum and Energy, and Animation]
45. "Recon 101 – Concepts and Techniques in Accident Reconstruction," 2 Hour, Continuing Education Seminar Presented at McCranie, Sistrunk, Anzelmo, Hardy, McDaniel & Welch LLC, New Orleans, LA, February 19, 2013.

46. "Recon 101 — Concepts and Techniques in Accident Reconstruction," 1 Hour, Accredited Continuing education Webinar, January 25, 2013.
47. "Recon 101 — Concepts and Techniques in Accident Reconstruction," 1 Hour, Accredited Continuing Education Webinar, January 18, 2013.
48. "Recon 101 — Concepts and Techniques in Accident Reconstruction," 1 Hour, Accredited Continuing Education Webinar, January 8, 2013.
49. "Physical Evidence that Reveals Driver Error," Continuing Education Seminar for Utah State Department of Transportation Claims Department, Salt Lake City, April 4, 2010.
50. "Investigations of Claims Involving Car Crashes," Invited Presentation, Training Conference for Investigators in the Washing State Attorney General's Office, Tumwater, WA, June 15, 2010.
51. "Investigation of Claims Involving Car Crashes," Invited Presentation, Training Conference for Attorneys, Paralegals, and Legal Assistants in the Washington State Attorney General's Office, Tumwater, WA, June 15, 2010.
52. "Forensic Engineering," Invited Presentation, Introduction to Engineering Class, Chaparral High School, Parker Colorado, March 19, 2010.
53. "Reconstruction of Crashes Involving Median or Roadside Barriers," Invited Presentation, Conference — Defense of WSDOT Torts, Office of the Attorney General, Tumwater, WA, October 21, 2009.
54. "ME4238/5238 - Impact Mechanics," an undergraduate and graduate level course taught in the College of Engineering and Applied Science at the University of Colorado Denver, Summer 2009.
55. "Determining Driver Error from Tire Marks and Quantifying the Severity of Highway Barrier Collisions," Invited Presentation, California Department of Transportation Tort Conference, San Diego Hilton, May 21, 2009.
56. "Analysis of a Dolly Rollover with PC-Crash," SAE Technical Paper Presentation, 2009 Society of Automotive Engineers World Congress, Detroit, Michigan, April 22, 2009.
57. "A Method to Quantify Vehicle Dynamics and Deformation for Vehicle Rollover Tests Using Camera-Matching Video Analysis," Guest Lecture, Forensic Methods Class, Wayne State University, April 15, 2008.
58. "Analysis of Vehicle-to-Ground Impacts during a Rollover with an Impulse-Momentum Impact Model," SAE Technical Paper Presentation, Society of Automotive Engineers World Congress, Detroit, Michigan, April 15, 2008.
59. "A Method to Quantify Vehicle Dynamics and Deformation for Vehicle Rollover Tests Using Camera-Matching Video Analysis," SAE Technical Paper Presentation, Society of Automotive Engineers World Congress, Detroit, Michigan, April 14, 2008.

60. "The Influence of Vehicle-to-Ground Impact Conditions on Rollover Dynamics and Severity," SAE Technical Paper Presentation, Society of Automotive Engineers World Congress, Detroit, Michigan, April 14, 2008.
61. "Factors Influencing Roof-to-Ground Impact Severity: Video Analysis and Analytical Modeling," SAE Technical Paper Presentation, Society of Automotive Engineers World Congress, Detroit, Michigan, April 17, 2007.
62. "Quantifying the Uncertainty in the Coefficient of Restitution Obtained with Accelerometer Data from a Crash Test," SAE Technical Paper Presentation, Society of Automotive Engineers World Congress, Detroit, Michigan, April 17, 2007.
63. "Restitution Modeling for Crush Analysis," SAE Technical Paper Presentation, Society of Automotive Engineers World Congress, Detroit, Michigan, April 5, 2006.
64. "Image Analysis of Rollover Crash Test Using Photogrammetry," SAE Technical Paper Presentation, Society of Automotive Engineers World Congress, Detroit, Michigan, April 4, 2006.
65. "An Examination of the CRASH3 Effective Mass Concept," SAE Technical Paper Presentation, Society of Automotive Engineers World Congress and Exhibition, Detroit, Michigan, March 11, 2004.
66. "High Speed Accident Investigation - Crashworthiness Evaluation," Training Seminar for Allstate Insurance, Knott Laboratory, Inc., Englewood, Colorado, December 5, 2002.
67. "Vehicle Accident Investigation - Evaluation of Motor Vehicle Crashworthiness," Training Seminar for Travelers Insurance, Denver, Colorado, June 7, 2002.
68. "Understanding Car Crashes," Training Seminar for State Farm Insurance, Greeley, Colorado, October 23, 2001.
69. "Computer Technologies in Crash Reconstruction," Rocky Mountain Crash/DUI Conference, Renaissance Hotel, Denver, Colorado, May 16-17, 2001.
70. "Analyzing Vehicle Dynamics & Occupant Injuries Using Computer Simulation," Knott Laboratory, Inc., Englewood, Colorado, September 12, 2000.
71. "Product Liability: Evaluation of Product Safety - Case Studies," Knott Laboratory, Inc., Englewood, Colorado, March 15, 2000.
72. "Vehicular Accident Reconstruction," Knott Laboratory, Inc., Englewood, Colorado, March 14, 2000.
73. "New Technologies in Accident Reconstruction," Society of Automotive Engineers Sectional Meeting, Knott Laboratory, Inc., Englewood, Colorado, January 19, 2000.
74. "The Role of Computers in Accident Reconstruction," Knott Laboratory, Inc., Englewood, Colorado, October 26, 1999.

75. "Courtroom Use of Photogrammetry, 3-D Computer Modeling and Animation," Knott Laboratory, Inc., Denver, Colorado, April 15, 1999.

## **ATTENDED TECHNICAL CONFERENCES, TRAININGS, AND SEMINARS**

---

1. "Motorcycle Collision Reconstruction," 4-day course, completed June 3, 2023, Instructor: Louis Peck.
2. "Advanced Crash Reconstruction Utilizing Human Factors Research - Factors that Influence Drivers' Response Times and Nighttime Recognition," Instructor: Jeffrey Muttart, 5-day course, February 8-12, 2021.
3. "Applying Automotive EDR Data to Traffic Crash Reconstruction," Instructor: Rick Ruth, Society of Automotive Engineers, Course #C1210, April 27-May 1 and May 4, 2020.
4. "Path Intrusion Reaction Time Studies," 4-hour webinar presented by Jeffrey Muttart, watched on March 13, 2020.
5. "Accident Reconstruction, the Autonomous Vehicle, and ADAS," Instructor: Alan Moore, Society of Automotive Engineers, Course #C1869, March 4, 2020.
6. "Link Right of Way (ROW) Worker Safety Training," online course from King County Metro Rail and Seattle Sound Transit, 1.5 hour, completed July 12, 2019.
7. EDR Summit, Houston, Texas, March 4-6, 2019 (Topics Covered: Bosch CDR Updates, Analyzing Steering, Yaw and Lateral Accel Stability Control System Data, Reconstruction of Crashes Involving Autonomous Vehicles, Determining Vehicle Speed from an Audio Recording, Video Analysis, Validation of Data from Vehicle Infotainment Systems, Using Struck Vehicle EDR Data in Reconstructing Motorcycle-Car Collisions).
8. "Basic RiderCourse," Motorcycle Safety Foundation, Completed at the Motorcycle Rider Training Center, Lakewood, Colorado, June 1-3, 2018,
9. EDR Summit, Houston, Texas, March 5-7, 2018 (Topics Covered: Bosch CDR Updates, EDR Throttle Input, Power Loss and Reported Vehicle Speeds, Subaru EDR Evidence, Tesla Autopilot, Self-Driving Vehicle and Driver Assistance Features, Detroit Diesel Engine EDR Overview and Updates, Case Studies in Bosch CDR Tool Retrieved Data, Legal Challenges Regarding EDR Data, Bendix ABS and Bend Data Recorder Data, EDR and Motorcycles).
10. "Path Intrusion Reaction Time Studies," 4-hour webinar presented by Jeffrey Muttart, watched on January 26, 2018.
11. "Drivers' Responses at Curves, Roadside Obstacles, and Intersections," 4-hour training webinar presented by Jeffrey Muttart, April 19, 2017.
12. NFL Head, Neck and Spine Engineering Subcommittee Meeting, 2017 NFL Scouting Combine, March 1 2017.
13. "Drivers' Responses at Traffic Signals and Intersections," 4-hour training webinar presented by Jeffrey Muttart, November 16, 2016.

14. "Presenting Data and Information," Edward Tufte, Denver, CO, July 22, 2016.
15. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2016. [At this conference, I attended presentations related to vehicle dynamics simulation, uncertainty analysis, and low-speed collisions.]
16. "Level 1: Photography Basics," 8-hour photography course offered by Photography Life (photography life.com), completed January 29, 2016. (Topics Covered: Camera Gear and Lenses, Tripods, Light, Exposure, Depth of Field, Camera Settings, Autofocus, Blur, Dynamic Range and Histograms)
17. "Unleash the Power of Your Sony A6000," 2-hour photography course taught by Gary Fong (www.garyfong.com), completed December 31, 2015.
18. "Reconstruction and Analysis of Motorcycle Crashes," 8-hour Course Hosted by the Society of Automotive Engineers, November 5, 2015.
19. "Commercial Vehicle Braking Systems e-Seminar," 18-hour Course Hosted by the Society of Automotive Engineers, Completed March 13, 2015.
20. PC-Crash Training - Scenes, 3-hour Training Webinar Hosted by MEA Forensics, February 16, 2015.
21. PC-Crash Training - Trajectory Model, 3-hour Training Webinar Hosted by MEA Forensics, February 17, 2015.
22. "Aviation Fundamentals Course (AV1)," Online Course Offered by Unmanned Experts covering topics relevant to the operation of Small Unmanned Aircraft System (sUAS), Completed on December 29, 2014.
23. "Basic RiderCourse Segment 1: E-Course," Motorcycle Safety Foundation, Completed on November 4, 2014 (Certificate ID: 25324).
24. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2014. [At this conference, I attended presentations/lectures related to pedestrian crash analysis, crush analysis, side-swipe collision, low-speed collisions, and bumped system testing.]
25. "Driver Distraction from Electronic Devices: Insights and Implications," 4-hour Course Presented by Jeffrey Hickman, Group Leader at the Virginia Tech Transportation Institute, 2-hour Sessions on April 3 and 5, 2013.
26. "Adobe Connect: Beyond the Basics," 1-hour Course Presented by David Walker, December 4, 2012.
27. Pedestrian versus Vehicle Crash Test Series (10 Tests, 3 Vehicles, Speeds between 15 and 40 mph), Hosted by the the Longmont Police Department, April 20, 2011.
28. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2011. [At this conference, I attended presentations/lectures related to accident reconstruction (utility pole impacts, tire force modeling, drag sled reliability, and event data recorders). I also participated in the meetings for the SAE's Accident Investigation and Reconstruction Practices Committee and the Animation Subcommittee.]



29. "Crash Data Retrieval (CDR) Technician - Level 1," 8-hour Course Presented by William Bortles, Greenwood Village, Colorado, March 8, 2011.
30. "Vehicle Braking Performance: Braking Confidence and Pedal Feel," On-Line Short Course Presented by Tom Hall, Society of Automotive Engineers, Course Completed by July 12, 2010. This course covered the relationship of the applied brake pedal pressure and travel to the resulting vehicle deceleration rate. The effect of each brake system component on this relationship was described and analyzed.
31. "Vehicle Braking Performance: Stopping Distance," On-Line Short Course Presented by Tom Hall, Society of Automotive Engineers, Course Completed on May 21, 2010. This course covered both vehicle and human factors affecting vehicle braking performance and accident avoidance capabilities. It also covered the effects of Anti-lock Brake Systems on braking performance and the limitations of these systems.
32. "Ordinary Error - Common Behaviors that Contribute to Crash Risk," Presentation by Human Factors Consultant Tom Ayres, Ph.D., October 21, 2009.
33. VAMPIRE Railway Vehicle Dynamics Simulation Software Training, 1-Week Course Presented by Matthew Dick of Rail Sciences, Inc., July 6-10, 2009.
34. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2009.
35. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2008.
36. "Tire Mechanics & Modeling," 1-Day Course Presented by Dr. Patrick Fitzhorn, Director of the Race Vehicle Dynamics Laboratory at Colorado State University, March 20, 2008.
37. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2007.
38. "Active Safety Technology: Paving the Road to Accident-Free Driving Telephone/Webcast," March 1, 2007.
39. CarSim 7 Training Session, Presented by Thomas Gillespie of Mechanical Simulation Corporation via Teleconference, December 13, 2006.
40. Skip Barber Driving School, Mazda Raceway at Laguna Seca, Monterey, California, November 11, 2006. This course consisted of classroom and in-vehicle instruction related to vehicle dynamics and handling, slides and recoveries, threshold braking, and racing basics. The in-vehicle instruction utilized the following vehicles: Dodge Neon, Dodge Dakota Pickup, Dodge Viper, and Porsche Boxster.
41. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2006.
42. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2004.
43. "Acceleration and VC2000PC Training," presented by Richard Jobe of Vericom Computers, Inc., South Metro Fire Headquarters, Greenwood Village, Colorado, June 27, 2000.
44. "Adding Value to Life Through Technology and Advanced Mobility," Society of Automotive Engineers World Congress 2000, Cobo Center, Detroit, Michigan, March 6-9, 2000.

---

## MOTORCYCLE RIDER AND RECONSTRUCTION TRAINING

---

1. "Motorcycle Collision Reconstruction," 4-day course, completed June 3, 2023, Instructor: Louis Peck.
2. Motorcycle Drop and Slide Tests, Bandimere Speedway, Morrison, Colorado, July 23, 2021.
3. "Motorcycle Crash Investigation," Illinois Association of Technical Accident Investigators (IATAI), October 7-8, 2019, Springfield, IL (1-day of crash testing and 1-day of coursework).
4. "Advanced RiderCourse," Motorcycle Safety Foundation, Completed at the Motorcycle Training Academy, Colorado Springs, Colorado, April 26, 2019, 2003 BMW F650 GS Dakar.
5. "Advanced RiderCourse," Motorcycle Safety Foundation, Completed at the Motorcycle Training Academy, Colorado Springs, Colorado, August 11, 2018, 2017 Honda Rebel 300.
6. "Street Strategies E-Course," Motorcycle Safety Foundation, Completed June 6, 2018 (Certificate ID: 1466423).
7. "Basic RiderCourse," Motorcycle Safety Foundation, Completed at the Motorcycle Rider Training Center, Lakewood, Colorado, June 1-3, 2018.
8. "Reconstruction and Analysis of Motorcycle Crashes," 8-hour Course Hosted by the Society of Automotive Engineers, November 5, 2015.
9. "Basic RiderCourse Segment 1: E-Course," Motorcycle Safety Foundation, Completed on November 4, 2014 (Certificate ID:25324).