



Résumé of
GRAY BEAUCHAMP, M.S., P.E.
Principal Engineer

KinetiCorp™

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EXPERIENCE: Principal Engineer, Senior Engineer, and Engineer, KinetiCorp, LLC, Denver, Colorado, April 2005 to Present
Engineer, Knott Laboratory, Inc., Centennial, Colorado, January 2003 to March 2005

EDUCATION: **M.S. Mechanical Engineering**, University of Colorado, Denver, 2015
B.S. Mechanical Engineering, Biomedical emphasis, University of Colorado, Boulder, 2002

REGISTRATIONS: Mr. Beauchamp is registered as a Professional Engineer in the State of Colorado. He is an accredited Traffic Accident Reconstructionist through the Accreditation Commission for Traffic Accident Reconstruction (ACTAR).

ENGINEERING: Mr. Beauchamp is an expert in traffic accident reconstruction, vehicle dynamics and driver response, and has investigated and reconstructed hundreds of vehicular accidents. Some specific examples of Mr. Beauchamp's experience are listed below:

- Mr. Beauchamp is an active member of the Society of Automotive Engineers (SAE). He is a peer reviewer for technical papers published in the rollover session, the accident reconstruction session, and in the Analysis, Synthesis, and Design of Advanced Suspensions session of SAE. He regularly presents his own research at the annual World Congress in Detroit Michigan.
- Mr. Beauchamp is an instructor for SAE's Reconstruction and Analysis of Rollover Crashes of Light Vehicles course. He has guest lectured on Accident Reconstruction at the Denver Police Department for officers training in the Level 3 Advanced Traffic Collision Investigation and Reconstruction Course. He has also guest lectured at the graduate level at the University of Colorado and Wayne State University.
- Mr. Beauchamp has performed full scale vehicle testing including rollover testing on a public highway in Utah, high speed tire disablement testing, high speed yaw testing and P.I.T (Pursuit Intervention Technique) testing with the Denver Police Department at their training facility in Denver, Colorado.
- Mr. Beauchamp specializes in single vehicle loss of control accidents. This includes both driver loss of control and vehicle rollovers. He has published numerous publications on these topics and has given lectures regarding these types of accidents.
- Mr. Beauchamp also specializes in heavy truck systems, including air brake systems, to determine their condition and relevance to an accident. He has completed numerous seminars on the topics of commercial vehicle accidents, air brake systems, and out-of-service criteria.
- Mr. Beauchamp analyzes occupant kinematics, including occupant motion and seat belt usage, in a variety of different accidents, including bus accidents and vehicle rollovers. He has also published with SAE on the topic of occupant ejection.
- Mr. Beauchamp has investigated accidents involving a variety of vehicles including tractor-trailers, buses, railway vehicles, farm equipment and animals, motorcycles, bicycles and passenger cars. Many of these accidents also involved pedestrians.
- Within the SAE, Mr. Beauchamp participated in the Accident Investigation and Reconstruction Practices Committee (AIRP) which drafted standards and recommendations regarding accident reconstruction. Additionally, he participated in three subcommittees within AIRP; the Critical Speed Taskforce, the EDR Working Group, and the Animation Committee.

RESEARCH: Mr. Beauchamp's current and past areas of research include rollover dynamics, crush energy analysis, vehicle handling, pneumatic tire disablement, and heavy truck braking. For his Master's Degree, Mr. Beauchamp's final project focused on how braking and steering inputs by the driver affect the specific tire marks that are deposited by a yawing vehicle. Several of Mr. Beauchamp's publications have been included in the SAE International Journal of Passenger Cars. As stated by SAE, "Only those outstanding and archival technical papers which either advance the state of the art or insightfully piece together prior research in ways which increase automotive understanding are selected for inclusion in this journal."¹

OTHER INTERESTS: Mr. Beauchamp is a licensed motorcycle rider. He is an avid snowmobile rider, snow skier and mountain biker.

PROFESSIONAL AFFILIATIONS: SAE - Society of Automotive Engineers; The Tire Society; INCR - International Network of Collision Reconstructionists. NSPE – National Society of Professional Engineers.

¹ "SAE International Journal of Passenger Cars - Mechanical Systems – Electronic Version." *Books.sae.org*. SAE, May 2012. Web. 22 March 2013

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Books

1. 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/>.

Publications

1. Neale, W., Terpstra, T., **Beauchamp, G.**, "Empirical Evaluation of in-field, binaural record and playback reproduction." *The Journal of the Acoustical Society of America* Volume 145, No.3, Pt. 2, March 2019: 4pAA12.
2. **Beauchamp, G.**, Pentecost, D., Koch, D., Bortles, W., "Speed Analysis of Yawing Passenger Vehicles Following Tire Tread Detachment," SAE Technical Paper 2019-01-0418, 2019.
3. Bortles, W., Koch, D., **Beauchamp, G.**, Pentecost, D., Rayburn, G., Hostetler, R., "Event Data Recorder Performance During High Speed Yaw Testing Subsequent to a Simulated Tire Tread Separation Event," SAE Technical Paper 2019-01-0634, 2019.
4. Koch, D., **Beauchamp, G.**, and Pentecost, D., "Deceleration Rates of Vehicles with Disabled Tires," SAE Technical Paper 2017-01-1427, 2017, doi:10.4271/2017-01-1427.
5. **Beauchamp, G.**, Pentecost, D., Koch, D., and Rose, N., "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.
6. **Beauchamp, G.**, Thornton, D., Bortles, W., and Rose, N., "Tire Mark Striations: Sensitivity and Uncertainty Analysis," *SAE Int. J. Trans. Safety*4(1):121-127, 2016, doi:10.4271/2016-01-1468.
7. Rose, N., Carter, N., and **Beauchamp, G.**, "Post-Impact Dynamics for Vehicles with a High Yaw Velocity," SAE Technical Paper 2016-01-1470, 2016, doi:10.4271/2016-01-1470.
8. **Beauchamp, G.**, Koch, D. and Thornton, D. E., "A Comparison of 25 High Speed Tire Disablements Involving Full and Partial Tread Separations," *SAE Int. J. Trans. Safety* 1(2):2013, doi:10.4271/2013-01-0776.
9. Carter, N., **Beauchamp, G.**, Rose, N. A. "Comparison of Calculated Speeds for a Yawing and Braking Vehicle to Full-Scale Vehicle Tests," Paper Number 2012-01-0620, Society of Automotive Engineers, Warrendale, PA, 2012.
10. Rose, N. A., **Beauchamp, G.**, "A Variable Deceleration Rate Approach to Rollover Crash Reconstruction," *Collision Magazine*, Volume 5, Issue 1, Spring 2010.
11. **Beauchamp, G.**, Hessel, D., Rose, N. A., Fenton, S. J., "Determining Steering and Braking Levels from Yaw Mark Striations," *SAE Int. J. Passeng. Cars – Mech. Sys* 2(1):291-307 (SAE Paper Number 2009-01-0092), 2009.
12. Rose, N. A., **Beauchamp, G.**, "Development of a Variable Deceleration Rate Approach to Rollover Crash Reconstruction," *SAE Int. J. Passeng. Cars – Mech. Sys* 2(1):308-332 (SAE Paper Number 2009-01-0093), 2009.
13. Rose, N. A., **Beauchamp, G.**, "Analysis of a Dolly Rollover with PC-Crash," Paper Number 2009-01-0822, Society of Automotive Engineers, 2009.

14. Rose, N. A., **Beauchamp, G.**, Fenton, S. J., “The Influence of Vehicle-to-Ground Impact Conditions on Rollover Dynamics and Severity,” 2008-01-0194, Society of Automotive Engineers, Warrendale, PA, 2008.
15. Rose, N. A., Fenton, S. J., **Beauchamp, G.**, “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.
16. Funk, J. R., **Beauchamp, G.**, Rose, N. A., Fenton, S. J., 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.
17. Rose, N. A., **Beauchamp, G.**, Fenton, S. J., “Factors Influencing Roof-to-Ground Impact Severity: Video Analysis and Analytical Modeling,” 2007-01-0726, Society of Automotive Engineers, Warrendale, PA, 2007.
18. Rose, N. A., **Beauchamp, G.**, Bortles, W., “Quantifying the Uncertainty in the Coefficient of Restitution Obtained with Accelerometer Data from a Crash Test,” 2007-01-0730, Society of Automotive Engineers, Warrendale, PA, 2007.
19. Rose, N. A., **Beauchamp, G.**, Fenton, S. J., “Restitution Modeling for Crush Analysis: Theory and Validation,” 2006-01-0908, Society of Automotive Engineers, Warrendale, PA, 2006.

Technical Conferences and Seminars

1. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2016.
2. “Applying Automotive EDR Data to Traffic Crash Reconstruction,” Society of Automotive Engineers, Norwalk, CA, December 6-9, 2015.
3. “Advanced Vehicle Dynamics for Passenger Cars and Light Trucks,” Society of Automotive Engineers, Troy, Michigan, October 29-31, 2014.
4. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2013.
5. “Human Factors in Traffic Crashes,” Presented by Jeff Muttart, Northwestern University, West Chester, Ohio, November 5 – 9, 2012.
6. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2012.
7. “Crash Data Retrieval (CDR) Technician – Level 1,” Course Presented by William Bortles, Greenwood Village, Colorado, March 8, 2011.
8. “Crash Data Retrieval (CDR) Technician – Level 2,” Course Presented by William Bortles, Greenwood Village, Colorado, March 8, 2011.
9. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2010.
10. “CVSA Seminar,” Colorado Motor Carriers Association, Denver, Colorado, August 27, 2009.
11. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2009.
12. “2008 SAE Government/Industry Meeting,” Society of Automotive Engineers, Washington, DC, May 13, 2008.
13. “VBOX Product Training,” VBOX USA, Denver, CO, April 21, 2008.
14. “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.
15. “Tire and Wheel Safety Issues,” Society of Automotive Engineers, Greenville, SC, June 22, 2007.
16. “Tire as a Vehicle Component,” Society of Automotive Engineers, Greenville, SC, June 21, 2007.
17. “Basic Rider Course,” T3RG Motorcycle Class, Denver, CO, May, 2007.

18. Society of Automotive Engineers World Congress, Detroit, Michigan, April 2007.
19. "Active Safety Technology: Paving the Road to Accident-Free Driving Telephone/Webcast," Society of Automotive Engineers, March 1, 2007.
20. CarSim 7 Training Session, Presented by Thomas Gillespie of Mechanical Simulation Corporation via Teleconference, December 13, 2006.
21. "Vehicle Dynamics for Passenger Cars and Light Trucks," Society of Automotive Engineers, Troy, Michigan, August 23-25, 2006.
22. "CVSA Critical Inspection Seminar," Colorado Motor Carriers Association, Denver, Colorado, July 27, 2006.
23. "Bendix Comprehensive Air Brake Systems Training," Bendix Corporation, Denver, Colorado, May 9-11, 2006.
24. "Inspection and Investigation of Commercial Vehicle Crashes," Institute of Police Technology and Management, Tempe AZ, December 8-12, 2003.

Instructor

1. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, Instructor, 16-hour course taught on November 2 - November 3, 2020, Virtual.
 2. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, Instructor, 8-hour course taught on October 14, 2019, Denver, CO.
 3. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, Instructor, 8-hour course taught on October 15, 2018, Los Angeles, CA.
 4. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, Instructor, 8-hour course taught on June 15, 2018, Detroit, MI.
 5. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, Instructor, 8-hour course taught on April 9, 2018, Detroit, MI.
 6. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, Instructor, 8-hour course taught on December 1, 2016, Norwalk, CA.
 7. "Reconstruction and Analysis of Rollover Crashes of Light Vehicles," Society of Automotive Engineers Course C1502, Instructor, 8-hour course taught on September 29, 2016, Scottsdale, AZ.
 8. "Tire Mark Forensic Evidence," Guest Lecturer, Wayne State University, BME 7810 – Forensic Bioengineering, Detroit, MI, April 14, 2010.
 9. "Tire Marks Deposited Preceding and Subsequent to Vehicular Impacts," Guest Lecturer, University of Colorado at Denver, ME 4238/5238 – Impact Mechanics, Denver, CO, June 30, 2009.
 10. "Level 3 Advanced Traffic Collision Investigation and Reconstruction," Instructor, Denver Police Department, Denver, CO, September 29, 2009.
 11. "Level 3 Advanced Traffic Collision Investigation and Reconstruction," Instructor, Denver Police Department, Denver, CO, October 2, 2008.
- Presentations**
1. "Science and Technology in the Courtroom – Tips From the Experts," American Bar Association – Transportation Megaconference XIII Trucking and Motor Carrier Litigation, New Orleans, LA, March 10, 2017.
 2. "Tire Mark Striations: Sensitivity and Uncertainty Analysis," SAE Technical Paper Presentation, 2016 Society of Automotive Engineers World Congress, Detroit, MI, April 13, 2016.
 3. "The Relationship Between Tire Mark Striations and Tire Forces," SAE Technical Paper Presentation, 2016 Society of Automotive Engineers World Congress, Detroit, MI, April 13, 2016.

4. "Testing the Validity of Myths Surrounding Tire Failures," American Bar Association – 2015 Emerging Issues in Motor Vehicle Product Liability Litigation, Phoenix, AZ, April 9, 2015.
5. "A Comparison of 25 High Speed Tire Disablements Involving Full and Partial Tread Separations," SAE Technical Paper Presentation, 2013 Society of Automotive Engineers World Congress, Detroit, MI, April 17, 2013.
6. "The Controllability of Various Tire Disablements: 25 High Speed Tests," American Bar Association – 2013 Emerging Issues In Motor Vehicle Product Liability Litigation, Phoenix, AZ, April 4, 2013.
7. "Severity Underreported: The Accident May Be More Severe Than You Think," American Bar Association – 2011 Emerging Issues in Motor Vehicle Product Liability Litigation, Phoenix, AZ, April 1, 2011.
8. "Development of a Variable Deceleration Rate Approach to Rollover Crash Reconstruction," SAE Technical Paper Presentation, 2009 Society of Automotive Engineers World Congress, Detroit, MI, April 22, 2009.
9. "Determining Steering and Braking from Yaw Mark Striations," SAE Technical Paper Presentation, 2009 Society of Automotive Engineers World Congress, Detroit, MI, April 21, 2009.
10. "Accident Reconstruction: Heavy Trucks," Morison Ansa Holden Assuncao & Prough LLP, Philadelphia, PA, June 2, 2008.
11. "Guardrail and Barrier Impacts," Caltrans Legal Department, Los Angeles, CA, August 7, 2007.
12. "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.
13. "Impaired Driver Awareness," Center for Transportation Safety, Fort Collins Colorado, March 24, 2005.