

ACCIDENT RECONSTRUCTION & ANALYSIS

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BRIAN DAVID CHARLES

CURRICULUM VITA January 2020

Mr. Charles provides consulting services and expert testimony (est. 1977). His principle area of expertise is in the area of motor vehicle accident reconstruction, crash analysis and associated fields. This includes field investigations to preserve evidence, photographic documentation, reconstruction of the crash, analysis of vehicle, occupant and roadway environment issues leading up to the crash. This often includes human factors as it relates to accident reconstruction. Typical issues analyzed are visibility, perception, reaction and evaluation of a driver's or pedestrian's response preceding a crash. This includes the use of photography to demonstrate and analyze visibility issues. He has conducted hundreds of visibility experiments and tests under daylight, nighttime and various lighting conditions. Mr. Charles routinely provides analysis and opinions relating to crash severity and general occupant motion in a crash event. The use of sophisticated computer simulation programs and other accepted methodologies are utilized in the analysis of vehicle collisions, occupant motion and vehicle dynamics before, during and after a collision. Mr. Charles' firm routinely provides other services such as forensic mapping, vehicle airbag and power control module downloads, and analysis of electronic control module data on heavy equipment. He is certified to download and analyze GM, Ford and Chrysler airbag modules supported by the CDR system. He is accredited (#78) by the Accreditation Commission for Traffic Accident Reconstruction (A.C.T.A.R.) since 1992.

Mr. Charles has been qualified in State and Federal courts to provide testimony in the areas of accident reconstruction, photography, photogrammetry and videography. Other areas include pre-impact speeds, occupant motion, visibility, perception, reaction, driver strategy, vehicle motion, crash severity, vehicle response in crashes, driver induced vehicle motion, and vehicle dynamics. These areas are all from the perspective of his work in crash reconstruction and analysis.

TRAINING AND EDUCATION:

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| 1972 | B.A. PSYCHOLOGY - New Mexico State University, Las Cruces, New Mexico. Curriculum included Calculus and Analytical Geometry, Perception, Physiology, Psychopharmacology and Human Performance. |
| 1973 | NEW MEXICO STATE POLICE TRAINING ACADEMY, Santa Fe, New Mexico. Course Curriculum included Accident Investigation, Locating and Preserving Physical Evidence from Accident Scenes, Speed and Position Determination in Accident Investigation. |
| 1979-81 | ENGINEERING MECHANICS AND PHYSICS FOR ENGINEERS
New Mexico State University, Las Cruces, New Mexico Undergraduate engineering courses were taken in Statics, Dynamics and Physics for Engineers. |
| 1980 | “VEHICLE ACCIDENT RECONSTRUCTION SCHOOL”
Arizona State University, Department of Applied Engineering
Three-week school devoted to all aspects of accident investigation and reconstruction. Course Curriculum included Interpretation of Physical Evidence at an Accident Scene, Mathematics and Physics Theory and Practical Applications in Accident Reconstruction, Motorcycle, Car and Heavy Truck Dynamics and Reconstruction. |

- 1981 “HUMAN FACTORS ENGINEERING”
University of Michigan, Ann Arbor, Michigan
A one-week engineering conference detailing theory and current research in the area of Human Factors, Engineering and How to Apply Principles of Human Perception and Performance in the Interaction with the Environment and specifically Visual Displays and Machines.
- 1982 “SAFETY DESIGN & OPERATIONAL PRACTICES FOR STREETS & HIGHWAYS”
Arizona Department of Transportation, F.H.W.A., Phoenix, Arizona
Course Curriculum included Safety in the Design of Streets and Highways, Methods of Analysis for Potential Conflicts, Operational Practices in Construction Zones, Safety and design of Highway Components such as Guardrails, Barriers, etc.
- 1982 “VEHICLE ACCIDENT RECONSTRUCTION SCHOOL”
Northwestern University Traffic Institute
Course Subjects included Mathematics and Physics, Vehicle Dynamics, Occupant Motion, Uses of Physics in the Analysis and Reconstruction of Vehicle Collisions, including Conservation Momentum and Energy Methods. Actual vehicle collisions were reconstructed and analyzed against known results.
- 1982 “MECHANICS OF HEAVY DUTY TRUCKS & TRUCK COMBINATIONS”
University of Michigan, Ann Arbor, Michigan
One-week engineering conference dealing with all aspects of heavy trucks from design to performance aspects. Current research areas were presented and discussed, including steering suspension, braking, performance and rollover analysis.
- 1989 “ENGINEERING DYNAMICS RECONSTRUCTION” SCHOOL
Stevens Institute of Technology, Hoboken, New Jersey
One-week course involving the use of CRASH Programs in Accident Reconstruction. Curriculum included review of all aspects of vehicle and collision models, detailed discussion of inputs and evaluation of output data. Emphasis on calculation methods including derivation of formulas used in the program.
- 1991 “ENGINEERING DYNAMICS SIMULATION COURSE”
St. Phillip’s College, San Antonio, Texas
One-week course in the use of computer simulations programs in accident reconstruction and analysis of vehicle performance, including heavy trucks. Emphasis on the technical aspects of the program, including input data and its effect on results. Vehicle tire and collision models were studied.
- 1992 “MOTOR VEHICLE ACCIDENT RECONSTRUCTION”
SAE International, Detroit, Michigan
Three-day course covering motor vehicle factors, vehicle motion analysis, accident avoidance analysis and collision analysis. The course emphasis was in the areas of braking analysis and collision analysis using linear and rotational momentum.
- 1997 “PEDESTRIAN/BICYCLE ACCIDENT INVESTIGATION”
Institute of Police Technology and Management, University of North Florida
One-week course covering vehicle dynamics/pedestrian behavior, pedestrian conspicuity/nighttime visibility, reconstruction techniques, bicycle collision analysis and hit and run techniques.

- 1998 “ENGINEERING DYNAMICS HVE FORUM”
Le Meridien Hotel, New Orleans, Louisiana
One-week course introducing the HVE Engineering 3-D software for vehicle dynamics and crash simulation. Subject matter included study of the HVE environment, databases, history, and validation of 3-D physics models. Selected case studies were reviewed and discussed.
- 1999 “ENGINEERING DYNAMICS HVE FORUM”
Atlanta Hilton & Towers @ Peachtree Center, Atlanta, Georgia
One-week course for HVE Engineering users. Subject matter included a review of current research and professional papers; software updates; case studies utilizing the various programs; and specific training examples in the proper utilization and application of the HVE Vehicle Dynamics Programs.
- 2000 SAE TOPTEC “PASSENGER CAR ROLLOVER TOPTEC: CAUSE & PREVENTION”
Paradise Point Resort, San Diego, California
Two-day topical, technical workshop. Subject matter included a study of the biomechanics of rollover, rollover causal analysis, effects of roadside design on rollover, occupant and vehicle motion preceding and during rollover, vehicle handling and roll propensity, tire effects on limit performance and rollover, and rollover sensor technology and sensing strategies.
- 2001 “THEORETICAL & APPLIED VEHICLE DYNAMICS COURSE” ENGINEERING DYNAMICS CORPORATION
Embassy Suites Hotel, Phoenix, Arizona
Course work included discussion of the equations describing vehicle handling and stability. Discussion of variables that affect vehicle response to driver inputs. Steady state and transient motion analysis of under-steer and over-steer characteristics; application of vehicle dynamic theory using the HVE 3D vehicle model (VSM) to evaluate the effects of cornering stiffness and loading.
- 2001 “CRASH DATA RETRIEVAL TRAINING & CERTIFICATION”
Santa Barbara, California
Instruction and training by Vetronix Corporation and General Motors Safety Engineering. Topics included history and development of event data recorders for automobiles relating to the production of air bag safety systems, and computerized diagnostic systems in vehicles and the utilization of that data by researchers and accident reconstructionists.
- 2002 SAE TOPTEC: “PASSENGER VEHICLE ROLLOVER TOPTEC: CAUSES, PREVENTION AND INJURY PREVALENCE”
Scottsdale, Arizona
Lectures included information on understanding differences in rollover propensity, handling and stability factors; acquiring insight on rollover issues; discussion of emerging safety issues that might affect vehicle rollovers; gaining perspective on passenger car rollover causes, prevention and injury; and exploring the latest developments in rollover simulation. Occupant motion was displayed during actual rollovers from various positions.
- 2004 “ENGINEERING DYNAMICS HVE FORUM”
Holiday Inn Crown Plaza, San Francisco
One-week course for HVE Engineering users. Subject matter included a review of current research and professional papers; software updates; case studies utilizing the various programs; and specific training examples in the proper utilization and application of the HVE Vehicle Dynamics Programs.

- 2006 “ENGINEERING DYNAMICS HVE FORUM”
Hilton Phoenix East, Phoenix, Arizona
One-week course for HVE Engineering users. Subject matter included a review of current research and professional papers; software updates; case studies utilizing the various programs; and specific training examples in the proper utilization and application of the HVE Vehicle Dynamics Programs. Emphasis on advanced applications of brake designer in modeling of heavy truck brake systems, Dymesh and SIMON Physics programs.
- 2006 “TEXAS ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS F³T² COMBINED CONFERENCE”
Houston Hilton/NASA Hotel, Houston, Texas
Four-day conference. Subject matter included Training and Presentations on crash tests, vehicle dynamics, heavy truck dynamics, downloading ECM data on heavy vehicles and Human Factors issues.
- 2008 “CRASH DATA RETRIEVAL - CDR USERS CONFERENCE”
Houston, Texas
Three-day conference. Subject matter included Training and Presentations on Crash Data Retrieval updated software.
- 2009 “CRASH DATA RETRIEVAL – CDR USERS CONFERENCE”
Houston, Texas. Three-day conference. Subject matter included Training and Presentations on Crash Data Retrieval updated software, including Chrysler vehicles.
- 2009 “BOSCH DATA RETRIEVAL SYSTEM TECHNICIAN CERTIFICATION COURSE”
Elk Grove Village, Illinois. Subject matter included function overview, system overview, mechanics of download, troubleshooting, and collecting and saving data for analysis.
- 2009 “BOSCH CRASH DATA RETRIEVAL (CDR) DATA ANALYST CERTIFICATION COURSE” – 32 Class Hours
Elk Grove Village, Illinois. Subject matter includes review and analysis of airbag module and PCM data from Ford, Chrysler and GM. Analysis of system and data anomalies, data correlation with the accident reconstruction.
- 2012 ENGINEERING DYNAMICS HVE FORUM February 27-29 3 days
New Orleans, La
Emphasis on advanced use of HVE SIMON and problem solving techniques. Heavy Truck braking simulation in EDSMAC 4 and SIMON.
- 2016 “CRASH DATA RETRIEVAL – LEVEL II CERTIFICATION COURSE – 1 Day.
January 25. Houston, Tx. Subject matter includes in-vehicle DLC data imaging, module location and identification and safety methods and procedures before direct to module imaging practical. Booster and adapter applications and “back-powering” in-vehicle systems to enable the preferred DLC data imaging approach. Updates on software, vehicle coverage, and imaging methods, Imaging Hybrid vehicles. (8 C.E.U.s)
- 2016 ARC-CSI CRASH CONFERENCE. May 23-26, 2016 in Las Vegas, NV. Vehicle and Motorcycle crash testing at the Motor Speedway. Data collection and video documentation for analysis. Review of the methodology, equipment, crashes and data collected. Other instructional sessions included; Analysis of when airbags deploy; Using Simulation in crash reconstruction; Presentation of methods to analyze pre-crash braking; Using NASS, NHTSA, and IIHS crash data in crash reconstruction; Photography in crash reconstruction; Working with Hybrid vehicle safety systems; and case studies of vehicle and motorcycle crashes. (26 C.E.U.s)

- 2016 SAE PROFESSIONAL DEVELOPMENT SEMINAR ID #C1210: August 15-17, 2016.
3 days. Rosemont, Illinois.
Applying Automotive EDR Data to Traffic Crash Reconstruction.
Class content included: An Overview of EDR data and availability by manufacturer.
EDR sensor operation, recording intervals, duration, resolution, accuracy, latency and limitations in applying data to crash analysis and reconstruction. Reconciling data with collected scene and vehicle data. Calculating impact, closing speeds and collision PDOF from EDR data; vehicle motion based on EDR impact and pre-impact data; time-distance analysis and plotting pre-crash EDR data on scene diagrams (images) to evaluate vehicle motion (dynamics) and driver behavior into the crash.
- 2017 ENGINEERING DYNAMICS HVE FORUM March 6-10, 2017 5 days
New Orleans, Louisiana.
One-week course for HVE Engineering users. Subject matter included a review of current research and professional papers; software updates; case studies utilizing the various software programs; and specific training examples in the proper utilization and application of the HVE Vehicle Dynamics Programs with an emphasis on SIMON. Review and advanced applications of BRAKE DESIGNER®, DYMESH damage model, DAMAGE STUDIO, tire blowout modeling and Rollover modeling and analysis

WORK EXPERIENCE:

- 1969-1973 Automotive Mechanic. Motor vehicle service and repair of cars and trucks - included brakes, fuel systems and drive train.
- 1973-1977 New Mexico State Police Officer
Principal duties were highway patrol and accident investigation. Additional duties included criminal law enforcement, bus driver certifications and safety. Investigated approximately 400 motor vehicle accidents.
- 1977-1986 Accident Reconstruction Expert & Consultant
Evans, Charles and Associates, Las Cruces, New Mexico
- 1979-1983 Part-Time Instructor, New Mexico State University
Departments of Police Science & Criminal Justice
Taught College Courses in Accident Investigation and Crash Reconstruction
- 1986 - Crash Reconstructionist & Consulting Expert
Present Accident Reconstruction & Analysis, Corpus Christi, Texas
Have investigated and/or reconstructed over 3,700 motor vehicle collisions including approximately 125 railroad related accidents and incidents.
Expert testimony provided in State and Federal Courts in Arizona, New Mexico, Colorado, Louisiana and Texas - Approximately 175 trials and 403 depositions.

CERTIFICATION:

A.C.T.A.R. –Member #78: Full Accreditation as a Traffic Accident Reconstructionist since 1992.
Accreditation Commission for Traffic Accident Reconstruction: Accredited through 2022
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North Platte, NE 69103-1493