

**CURRICULUM VITAE OF
RUDY DEGGER, ACTAR**

(877) 944-5903

www.rudydegger.com

Email: rudy@rudydegger.com

EDUCATIONAL AND PROFESSIONAL DEGREES AND CERTIFICATIONS

A.C.T.A.R. - Full Accreditation; Registration number 447, 1993

P.O.S.T. – Peace Officer Standards and Training: Basic, Advanced and Supervisory, 1988

California Community Colleges Limited Service Teaching Credential, University of California, Berkeley, 1986

Associate of Arts degree, Administration of Justice, Diablo Valley College, 1974

EMPLOYMENT

Rudy Degger & Associates, Inc., 1992-to present

The Office of the Sheriff, Contra Costa County, Law Enforcement Training Center; 2002-2016

Los Medanos College, Pittsburg, California; 1987-2001

University of California, at Riverside, Riverside, California; 1996-2000

Sacramento City College, Sacramento, California; 1996-2000

Contra Costa County Sheriff's Department, Martinez, California; 1975-1995

Richmond Police Department, Richmond, California; 1974-1975

PROFESSIONAL AFFILIATIONS

Governing Board of Directors (GBOD) member of the Accreditation Commission for Traffic Accident Reconstruction (ACTAR) from 2001 through 2008.

Society of Automotive Engineers (S.A.E.)

California Association of Accident Reconstructionist Specialists (C.A².R.S.) – *Founding Board Member, April 13, 1998; ACTAR Governing Board of Directors 1999-2007*

Northern California Fraud Investigators Association (N.C.F.I.A.)

National Association of Professional Accident Reconstruction Specialists (N.A.P.A.R.S.)

Society of Accident Reconstructionists (S.O.A.R.)

Southwestern Association of Technical Accident Investigators (S.A.T.A.I.)

Washington Association of Technical Accident Investigators (W.A.T.A.I.)

RELATED TECHNICAL EXPERTISE

Police officer – 1975-1995, retired police Sergeant, Contra Costa County Sheriff's Department.

Police accident investigator and reconstructionist - Investigation of more than 1000 traffic accidents as the uniformed at-scene police-investigator, plus the investigation of more than 300 additional accidents, after-the-fact, as the follow-up police investigator and/or police supervisor for the purpose of determining primary collision factors, estimating speeds, determining pre- and post-

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impact trajectories and the general reconstruction of the accident, taking statements, photographs and measurements, collecting physical evidence, preparing proportional and scaled diagrams and collision reports, miscellaneous advanced technical assistance, and court testimony. Traffic accident investigations and reconstructions included non-injury, injury and fatality accidents involving: auto-auto, auto-object, auto-pedestrian, auto-bicycle, bicycle-object, auto-truck, truck-truck, truck-pedestrian, truck-motorcycle, truck-bicycle, truck-object, auto-motorcycle, motorcycle-motorcycle, and motorcycle-object.

Accident report review officer - The review of several thousand accident reports from 1984 through 1987 and 1989 through 1995, as the Department traffic accident report review officer and as a police sergeant, respectively.

Traffic Bureau supervisor - Traffic Bureau Supervisor for the Sheriff's Department Contract City of Danville from 1989 through 1995.

IMPACT (team) supervisor - Lead member and supervisor of the Department's Injury and Major Prosecution Accident Call-out Team (I.M.P.A.C.T.) responsible for the reconstruction of major traffic accidents, from 1987 through 1995

Private accident reconstruction - Principle of RUDY DEGGER & ASSOCIATES, INC., the reconstruction of more than 2000 traffic accidents as a private consultant, including: skid mark analysis; speed estimation from skid marks, slide, linear momentum, damage, projectile motion, and energy; damage evaluation; time distance studies; video analysis; low-speed impact collisions, environmental, vehicle, and human factor comparisons; occupant kinematics; auto-pedestrian and auto-bicycle impact analysis; photography; and airbag control module crash data retrieval (aka "black boxes").

RESEARCH AND DEVELOPMENT

- 2017 Auto-Pedestrian Crash Testing: (1) Sacramento 2003, (2) Anaheim 2004, (3) Vallejo 2006, (4) Vallejo 2009, (5) Vallejo 2010, (6) Lodi 2012, (7) San Ramon 2012, (8) Anaheim 2012, (9) Modesto 2014, (10) San Mateo 2015, (11) Bakersfield 2016, (12) Clovis 2016 and (13) Sacramento 2017.
- 2017 Skid Testing: Approximately 85 skid tests done with various sedans, pickup trucks, and SUV's during the Auto-Pedestrian Crash Testing 2003 through 2017.
- 2005 Skid and critical speed yaw testing: Approximately 125 skid tests and 25 critical speed yaw tests at Los Medanos College and the Northern Law Enforcement Training Center (Office of the Sheriff, Contra Costa County) from 1987 through 2005.
- 2004 Motorcycle Crash Testing in Santa Rosa: Twenty-three motorcycle impact tests into stationary cars using twenty-three motorcycles and five cars, sponsored by CA²RS.
- 2003 Deceleration Testing in San Francisco: 1948 "Historic" SF Streetcar.
- 2002 Acceleration & deceleration testing of tractor-trailer combination and buses sponsored by CA²RS.
- 2000 Acceleration & deceleration testing of light and heavy vehicles and buses sponsored by CA²RS.
- 1999 Auto-Pedestrian Crash Testing sponsored by CA²RS.

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- 1999 High Speed Crash Testing: (1) Auto vs. Barrier UNDER-RIDE and (2) Auto vs, Barrier FULL and OFFSET impacts for CA²RS by Rudy Degger & Associates, Inc.
- 1999 Crash Testing: (1) Low speed Rear & Lateral Impacts, and (2) High speed Lateral Impacts for NCFIA in Monterey, CA, by Rudy Degger & Associates, Inc., Kerry A. Berg & Associates, Inc., Dan Trudell, and Mr. Truck.
- 1999 Low Speed Human Volunteer Crash Testing: Approximately forty rear, lateral, sideswipe and frontal Impacts by Rudy Degger & Associates, Inc. and Kerry A. Berg & Associates, Inc. and done in conjunction with and as an instructor in the course, *Principles of Low-Speed Impact Investigations*, which was taught at the University of California Riverside in 1996, 1997, 1998 and 1999.
- 1998 Motorcycle Skid and Slide Testing (coefficient of friction) for CA²RS 1998 and 1999 by Rudy Degger & Associates, Inc.
- 1998 High-Speed Crash Testing, Auto-Auto Lateral-Impact, for CA²RS 1998 and 1999 by Rudy Degger & Associates, Inc.
- 1997 Lamp Analysis Testing (on-off) at Los Medanos College by Rudy Degger.
- 1994 Auto-Pedestrian Crash Testing: Office of the Sheriff, Contra Costa County, Traffic Crash Call-out Team (I.M.P.A.C.T.).
- 1993 Skid testing: Comparison of standard brake system with A.B.S. brake systems for the Office of the Sheriff, Contra Costa County, Traffic Crash Call-out Team (I.M.P.A.C.T.).

COMPUTER SOFTWARE

Accident Reconstruction Calculator (ARC) for Windows 9x.x, NT, XP, Windows-7, Windows-8.1, and Windows-10; ©1998, ©1999 ©2000, ©2008. Designed and developed in conjunction with Sandoz Systems Solutions. Marketed and distributed under West Coast Accident Reconstruction Equipment (We.C.A.R.E.™).

RECONSTRUCTION TOOLS AND EQUIPMENT

DBD Crush Jig™ designed for measuring the crush on a damaged motor vehicle and for additional photographic evidence to illustrate the vehicle damage profile in high-speed impacts. Designed and developed in conjunction with Dolf M. Degger, and Kerry A. Berg & Associates, Inc. Marketed and distributed under West Coast Accident Reconstruction Equipment (We.C.A.R.E.™).

PUBLICATIONS AND SELECTED PAPERS

- 2014 Traffic Crash Investigation: Reconstruction Level (Student Text).
- 2005 Traffic Crash Investigation: Intermediate Level (Student Text).
- 2003 *Drag Factor: Three Techniques for Calculating the Drag Factor When Brake Force at Each Wheel is Unequal*, published in Skidmarks, Volume 20.
- 2002 *Calculating Impact Speeds Using Conservation of Energy*, Skidmarks, Volume 19.
- 2001 *Newton's Laws of Motion*, published in Skidmarks, Volume 14.
- 1999 *The Application of Momentum and Energy Principles in Motor Vehicle Accidents*, published in Skidmarks, Volume 6.

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- 1998 *Principles of Low Speed Impact Investigations*, UCR, Student Text.
- 1995 *The Analysis of Injury Potential in Low Speed Impact Collisions*, paper presented to attendees at the Northern California Fraud Investigators Annual Conference in Rohnert Park, CA.

EDUCATION AND SPECIALIZED TRAINING

- 2017 CDR System Operator Certification / Crash Data Retrieval (CDR) Data Analyst Course, W. R. "Rusty" Haight, Crash Data Retrieval Specialist, Collision Safety Institute (CSI), Chino, CA.
- 2016 Delta-V, Crush Energy and Momentum, CRASH and SMAC simulations (HVE and EDSMAC4), and Force Based Algorithm, (Principia Engineering: Eric Rossetter, Ph.D., P.E., Dan Desautels, M.S., P.E., and Jeff Cleary, B.S.), Lake Tahoe, CA.
- 2016 Injury Mechanism and Medical Causation for Collision Reconstruction (Dr. Sarb Dhesi D.C.), Vacaville, CA.
- 2016 Photogrammetry Methods for Collision Reconstruction (Louis R. Peck, MSME, Lightpoint Scientific and Dial Engineering), Vacaville, CA.
- 2016 World Wide Reconstruction Exposition, Orlando, FL. Modern Traffic Signals (Jeffrey W. Buckholz, Ph.D., P.E.), Video Analysis (Adam Cybanski), Motorcycle Speed from Deformation (Colin Glynn), Speedometer Analysis (Christopher Goddard BSc (Hons) CEng MIET), Commercial vehicle Air Brakes (Ronald B. Heusser), Motorcycle Reconstruction (Louis Peck, MSME), Auto-Pedestrian Collision Reconstruction (Mike W. Reade), EDR Update (Richard R. Ruth, P.E.), Cell Phone Technology (Christopher N. Sanchez), Heavy vehicle Reconstruction (David Stopper), Visual Amodal Perception (Dr. "Rick" Wakefield).
- 2015 Pedestrian and Bicycle Involved Traffic Crash Reconstruction, by Roger W. Barrette, MSE, Video Analysis for Crash Investigation, by Ken Engberg, Event Data Recorders: Updates, Standards, and Best Practices, by Adam M. Hyde, all material presented by Cooper Barrette Consulting, LLC and Northwestern Traffic Institute, at Orange, CA.
- 2015 Advanced Crash Reconstruction Utilizing Human Factors Research, Northwestern University, presented by Jefferey W. Muttart, Ph.D., ACTAR, at Glendale, AZ.
- 2015 Advanced Reconstruction with CDR Applications, presented by Gregory Russell, Accident Analysis and Reconstruction, Inc. and Crash Data Specialists, LLC, at Las Vegas, NV.
- 2015 Vision, Perception and Attention, and Pedestrian Crash Reconstruction Methods, presented by Jim Flynn, PE, J2 Engineering, at Vacaville, CA.
- 2015 Analytical Analysis of Low Speed Impact Limits Established by IIHS Comparisons, presented by Mark Whelchel, PE, Crush Analysis Mechanical Engineering, at Vallejo, CA
- 2014 CDR Technician Level 1 and 2 Certification: CSI Collision Safety Institute presented by Kent Boots, Factual Diagrams, Cameron Park, CA.

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- 2014 Reconstruction Methods: Momentum and CDR (Gary W. Cooper, PE, – Northwestern University), Monte Carlo Methods Applied to Crash Reconstruction (Roger W. Barrette, PE – Cooper Barrette Consulting), Force-Balance Methods (Adam M. Hyde – Cooper Barrette Consulting); Lake Tahoe, CA.
- 2013 Advanced Reconstruction Concepts – PDOF, Application of Laws of Sines and Cosines with CDR data, Closing Speed and Restitution, and Case Studies presented by Gregory Russell, Accident Analysis and Reconstruction, Inc. WATAI Fall Conference, at Redmond, WA.
- 2013 HVE Forum Workshop – Advanced HVE-2D, Damage Studio, and Heavy Vehicle Brake Simulation in EDSMAC4; Terry D. Day, P.E.; Engineering Dynamics Corporation, James P. Sneddon, Baker Sneddon Consulting; at San Diego, CA
- 2012 Motorcycles: Motorcycle Handling and Stability by Joseph Yates, PE; Motorcycle Speed Determination from Crush Analysis by Wade Bartlett, PE; Motorcycle Rider Behavior Research by Jeff Muttart; Motorcycle Sliding Friction Values by Louis Peck, PE; CAARS 14th Conference, at Lake Tahoe, CA
- 2011 Forensic Mapping System: Total Station / Pocket Zone, by Kent Boots of Factual Diagrams; at Oakley, CA.
- 2011 HVE Forum Workshop – HVE-2D+; Terry D. Day, P.E.; Engineering Dynamics Corporation, and James P. Sneddon (Baker Sneddon Consulting); at Scottsdale, AZ
- 2011 ARAS360 Animation Software, Chet Tomlinson, ARAS360; at Vallejo, CA.
- 2010 ARAS360 Animation Software, Dennis O'Brien, ARAS360; at Sacramento, CA.
- 2010 Energy Analysis: Spin Analysis, Crush Measurement Protocol, Delta-V and Impact Speed from Crush, Calculating Stiffness Values, and Balancing Collision Forces; John Dailey, MSME, Jackson Hole Scientific Investigations, Inc., Nathan Shigemura, Traffic Safety Group, LLC, and Dan Vomhoff III, PE, 4N6XPRT Systems; CAARS 12th Conference, at Lake Tahoe, CA
- 2010 Collision Fraud Investigation – Sergeant Chris Mendez and Detective Steve Hardy, California Department of Insurance (Orange County Urban Auto Task Force), at Sacramento, CA
- 2010 Accident Reconstruction and Biomechanical Analysis of Pedestrian Collisions – Jesse Wobrock, Ph.D. and Tia Orton, B.S., at Roseville, CA
- 2010 Crash Data Retrieval System Technician and Data Analyst Courses - W. R. "Rusty" Haight, Collision Safety Institute; at Vallejo, CA
- 2010 Rollover Crashes, Kurt D. Weiss, MSME, Automotive Safety Research; San Jose, CA
- 2010 HVE Forum Workshop – HVE-2D+; Terry D. Day, P.E.; Engineering Dynamics Corporation, Kenneth S. Baker and James P. Sneddon, Baker Sneddon Consulting; Joseph H. Canova; San Antonio, TX

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- 2009 Human Factors in Traffic Crashes: Driver Perception and Response Time for Path Intrusion, Cut-off, and Lead Vehicle situations, Acceleration, Search Area, Gap Acceptance, Nighttime Response and Driver Choice Decisions; Jeffrey W. Muttart, M.A., ACTAR, Accident Dynamics Research Center; at Sacramento, CA
- 2009 Measuring Drag Factor, Rick Jobe, Vericom Computers, Inc.; Narrow Object Impacts, Critical Speed and Yaw, Investigating Roll-Over Collisions, John Dailey, Jackson Hole Scientific Investigations, Inc.; Human Factors and Visibility, Momentum and Crush, John B. Kwasnoski, Legal Sciences; CAARS 10th Conference, Sacramento, CA
- 2008 Crash Zone Advanced, Factual Diagrams, Inc., Sacramento, CA.
- 2008 Traffic Signals: Nomenclature, Traffic Signal Timing and Phasing Diagrams, Pedestrian Signal Timing, Yellow times, Dilemma Zones, Advanced Loop Sensors, Perception Reaction Factors at Intersections, Last Look Phenomena, Path Intrusions, Gap Judgment and Start up Delay; Chris Kauderer, BSME, ACTAR; Vacaville, CA
- 2007 Crash Reconstruction – Auto-Pedestrian, and Low and High Speed Auto-Auto Crash Testing; Automobile Insurance Fraud, Tony Torres, California Department of Insurance; New Approaches to Auto-Pedestrian Reconstruction, Jerry Eubanks, Automobile Collision Analysis; Nighttime Visibility, Dave King, MEA Forensic Engineers & Scientists; Commercial Vehicle Accident Reconstruction Factors, Tim Reust, Accident Science; Errors & Omissions in Reconstruction, Bruno Schmidt, PhD; Understanding Low Speed Collisions, David King, MEA Forensic Engineers & Scientists; High Speed Offset Collisions, David King, MEA Forensic Engineers & Scientists; Anaheim, CA.
- 2007 Crash Zone Beginning, Factual Diagrams, Inc., Menlo Park, CA.
- 2006 Crash Data Retrieval System Operator's Certification Course - W. R. "Rusty" Haight (Collision Safety Institute); Vallejo, CA.
- 2006 Crash Reconstruction – Roadway Design and Sightline Issues, Anna Ristau, The CAD Zone, Inc.; Crash Data Retrieval Systems, Steve Haverkamp; Vehicle Inspections, Dean Linnens, CHP MAIT; Autopsies and Medical Records, Dr. Sean Shimada, PhD; Interviewing Techniques, Toni Wolfe, LAPD; at Lake Tahoe, CA.
- 2005 Crash Data Retrieval System - Operator's Certification Course Update, Rusty Haight (Collision Safety Institute); Las Vegas, NV.
- 2005 ARC-CSI Crash Conference; The Impact of Micro sleep (Fatigue) on the Driving Task, Whether Weather Influences Driver Response, and Perception and Reaction Times to Path Intrusions, Jeffrey W. Muttart, MA, ACTAR; When Do Airbags Deploy, Douglas A. Nunan (Delphi Electronics & Safety); Commercial Vehicle EDR Systems, Timothy J. Reust; Commercial Vehicle Brake Systems, Dave Stopper; Damage and Energy: How it Works / Why It Works, Bruno Schmidt, PhD; Child Safety Seat Issues in Crash Reconstruction, Mike McCullough; Analysis of Collisions Involving Pedestrians or Bicycles, Jerry Eubanks; Pedestrian Crash Case Studies, George Hall, PE; Pedestrian Crash Injuries, Jud Welcher, MME; Crash Data Retrieval System: Developments and Future Trends, Andrew Bunch (Vetronix Corporation); Las Vegas, NV.

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- 2005 Investigating Emergency Vehicle Collisions Conference – Human Factors, Dr. Stephen S. Solomon, BS, OD; EDR Downloads from Emergency Vehicles, Tim Reust; Construction of Firefighting Vehicles, Alan Irwin; POST Guidelines on Code-3 and Pursuit Driving, James Holder; Vehicle and Scene Documentation, Greg Matthews; Legal Aspects of Emergency Vehicle Operations, Deputy DA Creg Datig, Riverside DA; Temecula, CA.
- 2004 Vehicle Lamp Analysis; James Domenoie, Captain with Riverside County Sheriff's Office and former Chief of Police City for Temecula; at Pittsburg, CA.
- 2004 HVE Forum Workshop – HVE-2D / CRASH / SMAC / SVS / VTS; Terry D. Day, P.E.; Engineering Dynamics Corporation, Kenneth S. Baker & James P. Sneddon (Baker Sneddon Consulting); Wesley D. Grimes; Joseph H. Canova; at San Francisco, CA.
- 2004 ARC-CSI Crash Conference; Crash Testing – A Historical Perspective, Wilton D. Nelson, BSCE; Crash Data Retrieval System Update, Rusty Haight; Legal Implications of CDR Data Retrieval and Use, Mike Horowitz, Esq.; Crush Measuring Protocol, Nicholas S. Tumbas; Evaluating and using Crash Test Data, James A. Neptune; Commercial Vehicle EDR Systems, Timothy J. Reust; Restraint Evaluation for Collisions, Donald Felicella; Crash Testing Data (low speed, barrier and two-car collisions); at Las Vegas, NV.
- 2004 Motorcycle Investigation and Reconstruction Conference – Motorcycle Design, Tire and Tire mark Interpretation and Rider Habits, Steve Anderson; Motorcycle Brake Systems, Albert Baxter; Motorcycle Helmets and Injury Prevention, David R. Thom, MS; Relevant Motorcycle Laws and Lane Sharing, Steve Haverkamp; Santa Rosa, CA.
- 2003 Tire Forensics, Mechanics and Inspection, Thomas R. Giapponi, PE (TRGtech Tire Consulting); California Association of Accident Reconstruction Specialists, Concord, CA.
- 2003 Crash Data Retrieval System Operator's Certification Course; Collision Safety Institute, W.R. "Rusty" Haight; Concord, CA.
- 2003 HVE Forum Workshop – HVE-2D / EDCRASH / EDSMAC / EDSVS / EDVTS; Terry D. Day, P.E. and J. Travis Garvey (Engineering Dynamics Corporation); Kenneth S. Baker and James P. Sneddon (Baker Sneddon Consulting); Wesley D. Grimes; Las Vegas, NV.
- 2003 ARC-CSI Crash Conference; Analyzing Events Where Vehicles Move Through the Air in a Fall, Gary W. Cooper, PE, Fricke Cooper Engineering; Collision Trauma Biomechanics, Jud Welcher, BSME, MSBE, Biomechanical Research & Testing, LLC; Current Research in Low Speed Impacts – Biomechanics and Reconstruction, Thomas J. Szabo, PE, Biomechanical Research & Testing, LLC; Commercial Vehicle Event Data Recorders, Timothy J. Reust, PE, Accident Science; Las Vegas, NV.

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- 2003 Bicycles and In-line Wheeled Vehicles/Devices Conference; Razor Scooters/Bicycles, Tim Reust, PE, Accident Science; Accident Reconstruction Using Excel Spreadsheets, Bruno Schmidt, Ph.D.; Personal Mobility Devices, Thomas Fugger, PE, Accident Research and Biomechanics; Skateboard and Roller Blade Speeds, Jerry Eubanks, Automobile Collision Cause Analysis; Biomechanical Injury causation, Sean Shimada, Ph.D., Biomechanical Consultants of California; Medical Field and Collision Investigations, Dr. Frederico Vaca, MD, UCI Medical Center; Anaheim, CA.
- 2002 Accident Reconstruction of Heavy (Commercial) Vehicles; USDOT Motor Carrier Compliance, Hugo Segletes, Anaheim PD; Sixteen Crash Tests: Seven low speed rear-end impacts, three low speed broadside impacts, two low speed sideswipe impacts, one moderate speed rear-end impact, one high speed lateral impact against trailer axle, one rear-end trailer under ride impact and one lateral trailer under ride impact, David J. King, PE and Jonathan M. Lawrence, PE, MacInnis Engineering Associates; Instrumented Tractor-Trailer ABS Brake Testing, Commercial Vehicle Air Brake Testing, Commercial Vehicle Event Data Recorders and Vehicle Speed Calculation Using Running Gear Specifications, Timothy J. Reust, PE, Accident Science; Computer Application to Heavy vehicle Accident Reconstruction, Bill Cliff, PE, MacInnis Engineering; Determining Braking Efficiency (Heavy Vehicles), William M. Jones, Mr. Truck; Commercial Vehicle Mechanical Inspection, Alan D. Coulter, Motor Carrier Specialist, CHP MAIT, Border Division; Anaheim, CA.
- 2002 Injury Mechanisms during Motor Vehicle Collisions, Sean D. Shimada, Ph.D.; California Association of Accident Reconstruction Specialists, Davis, CA.
- 2002 PC Crash: Introduction to PC Crash – Training Workshop, William E. Cliff, PE (MacInnis Engineering; Garden Grove, CA
- 2001 Accident Reconstruction and Litigation Seminar: Human Factors in Traffic Accident Reconstruction, Paul L. Olsen, PhD; The Effects of Drugs and Alcohol on Driving, James T. O'Donnell, Pharm.D., M.S.; Accident Investigation and Reconstruction: Occupant Kinematics, Dynamics and Biomechanics, Alan J. Watts, PhD; Inducing Error and Injury: Distractions, Reactions and the Brain, George A. Peters, J.D., P.E.; Human Factors and Emergency Vehicles, Stephen S. Solomon, B.S., O.D.; Anaheim, CA.
- 2001 Tire and Wheel Related Reconstruction Issues, Harold Herzlich; Momentum, Gary Cooper; Pole Collisions, Joe Cofone; Southwestern Association of Technical Accident Investigators, Las Vegas, NV.
- 2001 Human Factors in Accident Reconstruction, Dean Reichenberg, CHP Special Investigation Unit (former MAIT); California Association of Accident Reconstruction Specialists; Concord, CA.
- 2001 Incident Management Concerns for the Traffic Collision Reconstructionist, Arnold Wheat; Roadway Issues in Accident Investigation, Jim Purcell, P.E., CHP MAIT; Critical Speed Testing Results and Analysis, Timothy J. Reust, P.E.; Investigation of Staged Traffic Collisions, Joseph J. Del' Marmol; Momentum Basics, Tom Shelton, CHP MAIT (retired); Concord, CA.

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- 2000 Tire Damage Analysis; Michelin Tire Company; University of California – Riverside, CA.
- 2000 Light and Heavy Vehicle Acceleration Tests; CA²RS Quarterly Training meeting at Stockton P.D., Stockton, CA.
- 2000 HVE Forum Workshop – HVE-2D / EDCRASH / EDSMAC; Terry D. Day, P.E. (Engineering Dynamics Corporation); Kenneth S. Baker and James P. Sneddon (Northwestern University Traffic Institute); San Diego, CA.
- 1999 The Practical Application of Crush, James A. Neptune, P.E. (Neptune Engineering, Inc.), Terry D. Day, P.E. (Engineering Dynamics Corporation), George M. Bonnett (Reconstruction Technology and Rec-Tec software); FARO Conference, OR.
- 1999 Speed from Crush; Donald J. Basham and James A. Neptune, P.E. (Neptune Engineering, Inc.), Collision Event Data Retrieval Technology and Computerized Vehicle Diagnostics; Donald Floyd, P.E. (General Motors Corporation - Michigan) and Donald Gilman, P.E. (Vetronix Corporation) 1st annual CA²RS Conference, CA.
- 1998 Momentum and Energy Principles, Dr. Gordon Bigg, Ph.D. and Dr. Bruno Schmidt, Ph.D., M.A.T.A.I. Conference, Kansas City, MO.
- 1998 Motorcycle Accident Investigation, Neil Robar; Vehicle Aerodynamics related to Accident Reconstruction, John Daly, P.E.; S.A.T.A.I. Conference, Phoenix, AZ.
- 1998 Understanding Occupant Behavior in Vehicle Collisions, Dr. Richard Froede, M.D. and Laurence G. Cripe, BCFE, ACTAR; Lamp Examination, Ray Gieszli; S.A.T.A.I. Conference, San Diego, CA.
- 1997 Damage Analysis and Speed Estimation from Crush, Timothy A. Moebes, P.E., Trantech Corp., *two high speed barrier staged collisions*, S.A.T.A.I. Conference, Phoenix, AZ.
- 1997 Close-Range Softcopy Photogrammetry In Accident Reconstruction, Harry W. Townes, P.E. (PhotoWin35), S.A.T.A.I. Conference, Phoenix, AZ.
- 1996 Low Speed and Minor Impact Collision and ABS demonstrations: MacInnis Engineering Associates Ltd.; Biomechanics of Injury: Liptai Engineering. N.C.F.I.A. Conference, Monterey, CA.
- 1996 Low Speed and Minor Impact Collision Testing, Mark Bailey, B.S. Mechanical Engineer, M.S. Metallurgy; Dave King, P.E., MacInnis Engineering Associates Ltd., fifteen low speed staged collisions, S.A.T.A.I. Conference, Phoenix, AZ.
- 1996 Motorcycle Crash Dynamics, Paul Olson, Faculty IPTM and Major with Bellevue Police Department Washington, S.A.T.A.I. Conference, Phoenix, AZ.

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- 1996 Low Speed Collision Toptec: *Injury Biomechanics*, Mark Gomez, Ph.D.; *Understanding "Whiplash"*, Whit E. McConnell, M.D., Richard Harding, Ph.D., Thomas M. McNish, P.E., M.D., Alfred P. Bowles, P.E., M.D., Scott W. Krenrich, M.D. (all with Biodynamic Research Corporation) and Louis Y. Cheng, Ph.D., Failure Analysis Associates, Inc.; *Human Volunteer Testing*, Gunter Sigmund, P.E., MacInnis Engineering and John R. Brault, M.S., Biomechanics Research and Consulting; *Human Subject Responses to Various Acceleration Fields*, Thomas J. Szabo, P.E., Biomechanist and Judson Welcher, P.E., Biomechanist, (both with Biomechanical Research and Testing); *Structures and Injuries of the Neck*, Barry Ph.D., Biomechanist, Duke University Faculty of Medicine; *Dynamic Requirements of Automobile Seatbacks*, Doug Romilly, Professor of Mechanical Engineering, University of British Columbia; *Rear-end Collisions - Dummy Testing*, Mats Y. Svensson, Ph.D.; *Comparison of Different Car Seats*, Adreas Moser, Technical University of Graz, Austria; *Reconstructing Minor Collisions*, Mark N. Bailey, B.S. Mechanical Engineer, M.S. Metallurgy, MacInnis Engineering; *Low Speed Vehicle Impact Demonstration*, David King, B.S., MacInnis Engineering. Society of Automotive Engineers, SAE TOPTEC, Vancouver, B.C., Canada
- 1995 Low Impact Collision Seminar, National Institute of Forensic Studies, Pleasanton, CA
- 1995 Computerized Collision Diagramming, Institute of Police Technology and Management, University of North Florida, Jacksonville, FL.
- 1995 Special Problems in Traffic Accident Reconstruction (Accident Animation and Simulation: Legal Issues; Occupant Kinematics and Human Tissue Injury Analysis; Night Visibility and Human Factors; New Automotive Lamp Technology; Low Speed Impact Analysis; Physical Evidence vs. the Eye Witness; Bus Accident Reconstruction; Vehicle Fire Analysis; Friction and Tire Forces; Multi-Unit Commercial Vehicle Analysis; Headlight Pattern Analysis), Institute of Police Technology and Management, University of North Florida, Jacksonville, FL.
- 1995 Tire Forensics for the Accident Investigator, Institute of Police Technology and Management, University of North Florida, Jacksonville, FL.
- 1995 Low Speed and Minor Impact Investigations: Basic Fundamentals and Application of Collision Test Data Seminar, Mark Bailey, B.S. Mechanical Engineer, M.S. Metallurgy; Dave King, P.E., MacInnis Engineering Associates Ltd., Jeff Wheeler, M.S. Biomechanical Engineer; Biodynamics Engineering Inc., thirty-five low speed staged collisions with live human volunteer test subjects, S.A.T.A.I. Conference, Phoenix, AZ.
- 1995 The Insurance Institute of Highway Safety, Vehicle Research Center, VA.; the National Crash Analysis Research Center, George Washington University Extension, VA.; Visual Estimation of Estimating Vehicle Damage and Evaluating Repair Estimates, Mr. Shelton, Property Claim Trainer, State Farm Insurance, S.O.A.R./T.A.A.R.S./W.A.T.A.I. Combined Conference, Charlottesville, VA.
- 1994 Staged Collision and Speed From Damage Analysis, Thad Aycock, The Traffic Institute, Northwestern University, S.A.T.A.I. Conference, Phoenix, AZ.
- 1994 Low Speed Rear Impact Collisions, Society of Automotive Engineers, SAE TOPTEC, Irvine, CA.

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- 1994 Critical Speed Analysis during Deceleration, Richard Chatman, W.A.T.A.I., A.C.T.A.R., S.A.T.A.I. Conference, Reno, NV.
- 1994 Work Zone Traffic Accidents, Arnold Wheat, S.O.A.R., A.C.T.A.R., S.A.T.A.I. Conference, Reno, NV.
- 1993 Investigation of Pedestrian Accidents, Instruction by Gary Stephens, S.A.T.A.I. Conference, Los Angeles, CA.
- 1993 Investigation of Pedestrian Accidents and Human Factors, Institute of Police Technology and Management, University of North Florida, Jacksonville, FL.
- 1993 Special Problems In Traffic Accident Reconstruction (Analyzing Nighttime Accidents; Tractor Trailer Jackknife Problems; Accident Fraud; Vehicle Rollovers; Lamp Analysis; Mechanical Vehicle Inspection; Airborne Accidents; Friction and Energy Problems; Occupant and Pedestrian Injury Analysis), Institute of Police Technology and Management, University of North Florida, Jacksonville, FL.
- 1993 Momentum and Crash 3 Applications, and Kinetic Energy and Speed Equivalent, Gary Cooper and Terry Day, S.A.T.A.I. Conference, Reno, NV.
- 1992 College Physics, Diablo Valley College
- 1992 Investigation of Motorcycle Accidents, Institute of Police Technology and Management, University of North Florida, FL.
- 1992 Formula Race Car Driver Training (at Laguna Seca Raceway), Jim Russell Racing Drivers School, Salinas, CA.
- 1991 Incident Commander/On-Scene Manager, Hazardous Materials Spills, California Specialized Training Institute, San Luis Obispo, CA.
- 1991 Microcomputer Application Programs In Traffic Accident Reconstruction, Traffic Institute, Northwestern University, IL
- 1991 Traffic Accident Reconstruction II, Traffic Institute, Northwestern University, IL.
- 1990 Computers & Data Processing, Diablo Valley College
- 1989 Microcomputers, Diablo Valley College
- 1987 Skid Mark Analysis, College of the Redwoods
- 1986 Drug and Alcohol Recognition Training, Los Medanos Community College
- 1986 Traffic Program Management, California State Polytechnic University
- 1986 Vehicle Dynamics, Traffic Institute, Northwestern University
- 1986 Traffic Accident Reconstruction, Traffic Institute, Northwestern University
- 1985 Speed Enforcement and Radar Operator Instructor, Los Rios Community College
- 1985 Advanced Accident Investigation and Reconstruction, Los Rios Community College

RUDY DEGGER & ASSOCIATES, INC.

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- 1983 Driver Training, Los Medanos College
- 1980 Skid Mark Analysis, CHP Pacheco Office, CA.
- 1979 Accident Investigation Class, CHP Academy, Sacramento, CA.
- 1977 Fortran Language Programming, Diablo Valley College
- 1972 Calculus, Chemistry and Engineering Drawing, Diablo Valley College
- 1971 Plane Surveying and Engineering Drawing, Diablo Valley College

EXPERT WITNESS TESTIMONY

Qualified as an Expert in Traffic Accident Reconstruction on at least 200 occasions in California State Superior and Municipal Courts and in Federal Court. Court locations include:

Alameda	Butte	Contra Costa	Fresno
Kern	Lake	Marin	Mendocino
Monterey	Napa	Sacramento	San Francisco
San Joaquin	San Mateo	Santa Clara	Santa Cruz
Shasta	Solano	Sonoma	Stanislaus
Tulare	Washoe County, NV	Yuba	

Selected expert testimony:

Accident speed determination by damage and/or energy analysis – Established pre-impact vehicle speeds based upon crush analysis of damaged vehicles and/or trajectories

Bicyclist impacted by motor vehicle – Bicycle position and vehicle impact speed determined by vehicle deceleration, rider and bicycle trajectory, damage and related physical evidence

Consistency of damage - Analysis of the reported damage to determine if the vehicles were involved in a reciprocal collision, based on the damage profile, the damage magnitude, witness marks and balanced forces

Crash Data Retrieval – Analysis of speed, brake application, and velocity change from data recorded by the airbag control module

Crush - Analysis of speed based on permanent deformation to the vehicles.

Environmental (roadway) factors - Determination of whether the road edge contributed to the cause of the accident by its size and shape, empirical test data and the pre- and post-impact trajectory of the motor vehicle

Failure to yield right-of-way at a controlled intersection – Determination of red/green signal light for vehicles through human factors analysis, signal light timing and phasing and speed of the vehicles from physical and testimonial evidence

Human factors - Perception and response time and distance based on the event type, weather and time of day. Sight distance and conspicuity based on the roadway configuration, vehicle size, shape and color, contrast, weather and lighting conditions

Injury probability and impact force – Determination of change-in-velocity (delta-V), g-analysis, occupant kinematics and injury probability in low-speed rear-end, front-end, lateral and sideswipe collisions

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Lane change - Determination of which vehicle made the lane change by the physical characteristics and physical evidence on the involved vehicles, the post-impact trajectory and by the use of computer software to create a 2-dimensional simulation of the accident

Linear momentum analysis – Determination of the pre-impact speeds of automobiles and trucks from the pre- and post-impact trajectories and vehicle weights

Motorcycle speed determination by damage – Established a pre-impact motorcycle speed based on crush analysis of damage car, wheelbase deformation of the subject motorcycle and supporting crash test literature and documentation

Pedestrian impacted by a motor vehicle – Pedestrian's position and vehicle impact speed determined by vehicle deceleration, pedestrian trajectory and related physical evidence

Police procedures – Proper operation of an emergency vehicle for an officer who collided with a motor vehicle turning left at an intersection; specifically, speed and lane position; general procedures, requirements and definition of code-2 and code-3 response, proper and expected behavior and police procedures that relate to accident prevention; the equipment necessary to comply with the CVC laws

Time-distance analysis – Motor vehicle, bicycle, motorcycle and pedestrian positions based on acceleration (positive, negative and zero) for the purpose of determining right-of-way, probable impact speeds and line-of-sight

Tire skid mark analysis – Speed determination of automobile and motorcycles from locked-wheel skid marks and Critical Speed Scuff marks

Two-dimensional computer simulations - Time-distance, pre-impact speeds and vehicle interaction have been illustrated with the use of computer simulations using both static and dynamic displays

Video Analysis – Video frame rate, frame capture, elapsed time, position on road, distance traveled, acceleration and deceleration rate, and calculation of speed.

TEACHING EXPERIENCE

Law Enforcement Training Center, The Office of the Sheriff, Contra Costa County, from 1/2002 to 7/2016; Principle Instructor for the following classes: (1) Basic, Intermediate and Advanced Accident Investigation; (2) Traffic Accident Reconstruction Level 1 and Level 2; and (3) Speed Determination from Crush. Subject matter includes: Crash investigation and reconstruction; Skid mark analysis and speed analysis from skid marks; Friction coefficient, velocity and acceleration concepts; Kinematics; Projectile motion, including pedestrian and motorcycle rider throw; Force and energy considerations; Applied physics; Algebra and Trigonometry; Vehicle dynamics; Conservation of linear momentum; Conservation of energy; Speed from crush; Equation derivations; Scale diagramming; Seatbelts; and Human Factors related to Driver Response, Vehicle Factors including on-off analysis of headlights and taillights, and Environmental factors relating to motor vehicle collisions.

Auto-Pedestrian Traffic Accident Investigation (40-hour class). Classes have been held as follows: (1) Sacramento, CA in 2003; (2) Anaheim, CA in 2004; (3) Vallejo, CA in 2006; (4) Vallejo, CA in 2009; (5) Vallejo, CA in 2010, (6) Lodi, CA in 2012, (7) San Ramon, CA in 2012 (8 hours), (8) Anaheim, CA in 2012 (8 hours), (9) Modesto, CA in 2014, (10) San Mateo, CA in 2015, (11) Bakersfield, CA in 2016, (12) Clovis, CA in 2016, and Sacramento, CA in 2017.

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Los Medanos College, Northern California Criminal Justice Training Center, 1987-2001.

University of California at Riverside, 1996-2000. Classes taught: (1) Speed Determination from Crush, (2) Principles of Low-Speed Impact Investigations, (3) Intermediate and Advanced Accident Investigation, and (4) Traffic Accident Reconstruction.

Los Rios Community College and Sacramento City College, 1996-2000

Instructor for Contra Costa County Sheriff's Department from 1982 through 1995, subjects taught included: pursuit and code-3 driving; drug and alcohol recognition; radar error recognition; seatbelts; traffic control; and California Vehicle Code.

GUEST SPEAKER APPEARANCES

- 2017 Sacramento Police Department, California, Energy and Damage Analysis in Crash Reconstruction – Speed from Crush, Sacramento, CA.
- 2014 Washoe County Sheriff's Department, Nevada, Basic Motion Analysis, Projectile Motion Analysis, Human Factors, Momentum Analysis, and Tire Friction Marks, Reno, NV.
- 2007 California Association of Accident Reconstruction Specialists, *Projectile Motion: Calculating Speed at Lift-off*; Long Beach, CA.
- 2007 City of San Francisco, Assistant City Attorneys and Investigators, Basic Accident Investigation Techniques, San Francisco, CA.
- 2006 California Association of Accident Reconstruction Specialists, *Two Case Studies: Momentum Analysis: The Left Turning Vehicle, and Momentum Analysis: The Broadside Impact*; Lake Tahoe, CA.
- 2005 California Association of Accident Reconstruction Specialists, *Case Study: Speed, Time and Distance Analysis plus Human Factors and Analysis of Driver Line of Sight for a Fire Engine versus Auto Crash while Fire Engine responding Code-3 to a Building Fire*; Temecula, CA.
- 2004 California Association of Accident Reconstruction Specialists, *Momentum Review: Using Momentum to Calculate Impact Speed*, Anaheim, CA.
- 2003 ARC-CSI Crash Conference, *Crash: Mass Reduction Factor and Delta-V*; Las Vegas, NV.
- 2003 Orange County Sheriff's Office MAIT Team, *Conservation of Momentum and Energy Reviewed; Varied Methodologies for Calculating Impact Speed From Crush*, Aliso Viejo, CA.
- 2003 California Association of Accident Reconstruction Specialists, *Time-Distance Review and Using PowerPoint for Presenting Time-Distance Analysis in the Courtroom*, Anaheim, CA.
- 2001 California Association of Accident Reconstruction Specialists, *Back to Basics: Energy and Vehicle Crush Applications – The Do's and Don'ts*, Concord, CA.
- 2001 Southwestern Association of Technical Accident Investigators, *Crash and Energy Application in Accident Reconstruction*, Las Vegas, NV.
- 2001 Lawyers & Judges Accident Reconstruction and Litigation Seminar, *Vehicle Crush Application: The Do's and Don'ts*, Anaheim.

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- 1999 Forensic Accident Reconstructionists of Oregon, *The Practical Application of Crush*.
- 1999 Northern California Fraud Investigators Association, *Accident Reconstruction: The Low Speed Accident*, Monterey, CA.
- 1999 The American Corporate Counsel Association, *Low Speed Impact Analysis*, in Washington, D.C.
- 1998 California Chiropractic Association, *Accident Reconstruction and the Low Speed Impact*, in Orange County in 1997 and in Concord in 1998.
- 1996 Northwestern University Traffic Institute, *Energy Techniques in Accident Reconstruction*, class held in Oakland, CA.
- 1996 Consortium of Accident Reconstruction Specialists (now CA²RS), *Reconstruction of Auto-Pedestrian Traffic Collisions*, in San Jose, CA.
- 1995 Palo Alto Police Department, *Accident Reconstruction Techniques*.
- 1995 Northern California Fraud Investigators Assoc., *Low Speed Impacts*, in Rohnert Park, CA.

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