

Andrew S. Rich, BSME, ACTAR, ASE

Rich Consulting, LLC

P.O. Box 13618, Fairlawn, OH 44333 Tel.: (234) 201-7676 E-mail: andy@rich-llc.com Web: www.rich-llc.com

EDUCATION

New Jersey Institute of Technology

- Bachelor of Science in Mechanical Engineering, Summa Cum Laude
- Senior design project: An Excel Application to Estimate the Impact Speed of a Vehicle After a Collision with a Utility Pole or Tree

ACCREDITATIONS AND LICENSES

Accreditation Commission for Traffic Accident Reconstruction (ACTAR)

- Certificate of Full Accreditation #1776, Sep. 2006

National Institute for Automotive Service Excellence (ASE)

- Certified Automotive Technician #ASE-5604-6945, Dec. 2016

Federal Aviation Administration

- Private Pilot, Single Engine Land, Sep. 2002
- Remote Pilot (Drone), Mar. 2021.

EXPERIENCE

Rich Consulting, LLC

Dec. 2012 to Present

Principal, Accident Reconstructionist

- More than 1800 hours of training concentrated in Traffic Crash Reconstruction/Investigation
- Routinely perform complex analyses including:
 - Speed Calculations, Human Factors Elements, Time-Distance, Event Data Recorder (“black box”) Imaging, Energy Damage Profile, Lamp Examinations, Occupant Kinematics, Video Speed Analysis, and Monte Carlo analysis.
- Serve as an expert for legal matters involving:
 - Fatality/Serious Injury Collisions, Passenger Vehicles, Commercial Vehicle Collisions, Pedestrian, Motorcycle, and Bicycle Collisions.
- Utilize the Leica BLK 360 Laser Scanner for precise measurements to produce 3-D Point Cloud Models, demonstratives, animations, simulations, and diagrams.
- Utilize a Mavic 2 Pro unmanned aerial system (drone) to obtain point clouds, textured meshes, orthomosaic scene images and accurate measurements of scenes.
- Utilize a Carlson Robotic Total Station and RTK GNSS for forensic mapping of scenes and vehicle damage.
- Utilize Virtual Crash 5 software to simulate and animate passenger vehicle, heavy truck, pedestrian, and bicycle accidents.
- Perform photogrammetric analyses (obtaining measurements from photos and/or video).
- Utilize the equipment necessary to obtain data from automotive event data recorders (EDR) and heavy truck engine control modules (ECM).

- Instruct police officers, engineers, and insurance employees in the use of the Bosch Crash Data Retrieval Tool and in the interpretation of EDR data.

University of Tulsa Traffic Crash Reconstruction Consortium

2010 – 2015

Contract Test Engineer

- Planned, prepared, and executed bicycle, pedestrian, passenger vehicle and heavy truck crash tests
- Analyzed data from laboratory-grade instruments utilized in crash tests

Crash Test Team, University of North Florida (IPTM)

2007 – Present

Member

- Plan, prepare and execute bicycle, pedestrian, passenger vehicle and heavy truck crash tests
- Analyze data from laboratory-grade instruments utilized in crash tests

University of North Florida, Institute of Police Technology and Management

2003 – Present

Adjunct Instructor

- Instruct and design advanced accident reconstruction courses
 - Applied Physics
 - Vehicle Dynamics
 - Traffic Crash Reconstruction Update
 - Energy Methods and Damage Analysis
 - Event Data Recorder Level I
 - Event Data Recorder Level II
 - Forensic GPS Investigations
 - Advanced Pedestrian/Bicycle Accident Reconstruction
 - Post-Crash Forensic Vehicle Examinations

Bergen County Prosecutor’s Office, Paramus, NJ

1999 – 2012

Detective/Pilot

- Assigned to the Fatal Accident Investigation Unit (FAIU) and the Aviation Unit. Responsible for supervising serious/fatal collision investigations occurring within Bergen County. Duties included:
 - Collision analysis and reconstruction
 - Supervised a twenty-four-member Fatal Accident Investigation Unit Task Force
 - Reviewed and approved all task force reconstructions
 - Prepared forensic maps using a total station, high-definition laser scanner, and computer aided drawing (CAD) software
 - Performed forensic vehicle, scene, and pedestrian examinations
 - Downloaded and interpreted event data recorder (EDR) data
 - Assisted Homicide and Arson Squads with crime scene documentation/measurements
 - Interviewed hundreds of witnesses to serious and fatal motor vehicle collisions

Palisades Interstate Parkway Police, Alpine, NJ

1988 – 1999

Police Sergeant

- Supervised all serious and fatal collision investigations
- Collision analysis and reconstruction
- Performed forensic vehicle, scene, and pedestrian examinations
- Investigator for the Bergen County Prosecutor’s Office Fatal Accident Investigation Unit

Larry Peters Hyundai, Ramsey, NJ

1987 – 1988

Auto Mechanic

Brogan Cadillac, Ridgewood, NJ <i>Auto Mechanic</i>	1986 – 1987
Glen Motors Toyota, Hawthorne, NJ <i>Auto Mechanic</i>	1982 – 1983

ADDITIONAL TEACHING EXPERIENCE

• ACTAR Exam Preparation	2010 – Present
• Using Microsoft Excel for Traffic Crash Reconstruction	2011 – Present
• Vehicle Dynamics Instructor for the New Jersey Dept. of Highway Traffic Safety	1999 – 2003
• Bergen County Prosecutor’s Office Fatal Accident Investigation Unit Training	1999 – 2012
• Student Tutor at Bergen Community College, Paramus, NJ	1997 – 1998
○ Algebra, Precalculus, Calculus, and Physics	

RELEVANT EDUCATION AND TRAINING

Accident Reconstruction, The Autonomous Vehicle and ADAS Society of Automotive Engineers. Troy, MI (7 hours)	Aug. 2021
Optics, Lighting, Visibility and Digital Photography for Forensic Investigators Clearly Visible Presentations, LLC. West Chester, OH (23 hours)	Jul. 2021
Symposium on Traffic Safety University of North Florida, IPTM. Orlando, FL (32 hours)	Jun. 2021
• Accessing Toyota Vehicle Control History and Collision Avoidance Data	
• Kawasaki Event Data Recorder	
• Capturing Data Using the UAV, GNSS, Scanner and Total Station Toolbox	
• Vehicle System Forensics	
What’s a Fuel Trim?—Decoding Gasoline Engines for the Medium/Heavy Truck World Isuzu Truck University (1 hour)	May 2021
FARO Zone3D Training FARO (10 hours)	Mar 2021
Electronic System Diagnostic Strategies National Institute for Automotive Service Excellence (1 hour)	Mar 2021
Why Green May Not Mean Go for Alignments National Institute for Automotive Service Excellence (1.5 hours)	Mar 2021
Stop-Start System Technologies—Theory, Operation and Diagnostics National Institute for Automotive Service Excellence (1.5 hours)	Feb. 2021
CloudCompare Course Ai2-3D (8 hours)	Nov. 2020

Virtual Annual Joint Conference National Association of Professional Accident Reconstruction Specialists (6 hours)	Oct. 2020
<ul style="list-style-type: none"> • Perception Response Time in Different Crash Types • Obtaining Chip-Level Data from [Event Data Recorder] Modules • Analysis of ECM Data in New Freightliners 	
Photogrammetry for Forensics Ai2-3D (8 hours)	Oct. 2020
Tire Pressure Monitoring System Diagnosis and Servicing—Webinar for Technicians National Institute for Automotive Service Excellence (1 hour)	Aug. 2020
TPMS 2020—It’s Not Just the Warning Light Anymore--Webinar for Technicians National Institute for Automotive Service Excellence (1 hour)	Jul. 2020
CCAR’s Hybrid Electric/Electric Vehicle Safety--Webinar for Technicians National Institute for Automotive Service Excellence (1 hour)	May 2020
Electrical Diagnostic Skills & Strategies--Webinar for Technicians National Institute for Automotive Service Excellence (1 hour)	May 2020
EDR Summit Crash Data Group. Houston, TX (18 hours)	Mar. 2020
<ul style="list-style-type: none"> • Toyota Vehicle Control History Data • Subaru ADAS System • Pedestrian Automatic Emergency Braking • Tesla EDR Update • Ignition Cycles • Locomotive Event Data Recorders • Crossing Signal Event Recorders 	
Virtual Crash Simulation Software Forensic Training Group. Atlanta, GA (24 hours)	Oct. 2019
Operation and Maintenance of Heavy-Duty Vehicle Air Brake Systems and Components Bendix Spicer Foundation Brake, LLC. Elyria, OH (24 hours)	Oct. 2019
Scanning & Software Workshop FARO. Hudson, OH (4 hours)	Mar. 2019
Heavy Vehicle Event Data Recovery and Analysis Commonwealth Transportation Consultants. Charlotte, NC (24 hours)	Feb. 2019
Crash Reconstruction with Video Evidence OTARA. West Chester, OH (6 hours)	Nov. 2018

<p>Pennsylvania State Police Collision Reconstruction Seminar Gettysburg, PA (10 hours)</p> <ul style="list-style-type: none"> • Distracted driving • Acceleration: Lateral, forward, backward, and heavy truck • Role of NTSB and autonomous vehicle crashes • Pedestrian walking speeds • Heavy vehicle event logging devices 	Oct. 2018
<p>Symposium on Traffic Safety University of North Florida, IPTM. Clearwater Beach, FL (6 hours)</p> <ul style="list-style-type: none"> • Human factors Research Update • FARO Zone 3D • Using 3D Scanners in Crash reconstruction 	May 2018
<p>Traffic Crash Analysis Using Virtual Crash Software Forensic Training Group. Nashville, TN (19 hours)</p>	Mar. 2018
<p>Heavy Truck Crash Reconstruction—Including Digital Forensics Forensic Training Group. Nashville, TN (21 hours)</p>	Feb. 2018
<p>Pennsylvania State Police Collision Reconstruction Seminar Pennsylvania State Police. Gettysburg, PA (4 hours)</p> <ul style="list-style-type: none"> • Results of Human Factors Testing • Heavy Truck Inspections 	Oct. 2017
<p>EDR Summit Collision Safety Institute and Collision Publishing. Houston, TX (20 hours).</p> <ul style="list-style-type: none"> • Hyundai/Kia Update • Autonomous Vehicles • Data from Infotainment Systems • Forensic Data from Heavy Vehicle Networks • Toyota Gen 3 Pre-Crash Brake Data • Asynchronous Data Concepts in EDR Data • Atypical Airbag Deployment Cases • Forensic Methods for Dealing with Damaged ECM/ECU Components 	Mar. 2017
<p>Bridgestone/Firestone Tire Forensics and Accident Investigation Clinic Bridgestone/Firestone. West Chester, OH (6 hours)</p>	Dec. 2016
<p>Optics, Lighting, Visibility and Digital Photography for the Forensic Investigator Clearly Visible Presentations, LLC. Indianapolis, IN (40 hours)</p>	Sep. 2016
<p>Advanced Crash Reconstruction Utilizing Human Factors North Western University (40 hours)</p>	May 2016
<p>Comprehensive Air Brake Systems Training Program Bendix. Online (3.5 hours)</p>	Mar. 2016

CDR Summit	Jan. 2016
Collision Safety Institute and Collision Publishing. Houston, TX (20 hours)	
<ul style="list-style-type: none"> • Non-Supported Ford Vehicles • Damaged Airbag Control Modules • Hyundai-Kia Update • FCA Update • ACM Reprogramming Update • Testing and Analysis of Unsupported Kia Data 	
2015 Illinois Association of Technical Accident Investigators Conference	Sep. 2015
East Peoria, IL (24 hours)	
<ul style="list-style-type: none"> • Vehicle Inspections, Nomenclature, and Inspections • Traffic Emerging Technologies 	
Special Problems in Traffic Crash Reconstruction	May 2015
University of North Florida, IPTM. Clearwater Beach, FL (32 hours)	
<ul style="list-style-type: none"> • The Proper Use of Simulation Technology for Collision and Rollover Reconstructions and Highway Safety • Air Brake Inspections and Brake Force Calculations for Heavy Vehicles Equipped with Air Disk Brakes • Video Analysis and Court Presentation in Collision Investigations • Crush, Stiffness Values, and Force Balance Case Study Application(s) • Crash Simulation 101 • Working with Time and Distance in the World of EDRs 	
CDR Summit	Jan. 2015
Collision Safety Institute and Collision Publishing. Houston, TX (20 hours)	
<ul style="list-style-type: none"> • Toyota Event Recording Prioritization • Non-Supported Nissan and Infiniti Vehicle Crash Data • GM Ignition Switch Failures and the Associated CDR Data • New Vehicle Technologies • Clearing an ACM—What is it, How is it Done? 	
Roadway Design and Maintenance, Intersection Control, Punitive Damages, and MUTCD	Feb. 2014
New York Statewide Traffic Accident Reconstruction Society. Valhalla, NY (7 hours)	
Special Problems in Traffic Crash Reconstruction	May 2013
University of North Florida, IPTM. St. Pete Beach, FL (37 hours)	
<ul style="list-style-type: none"> • Event Data Recorder Update (ver. 10.2) • CRASH3 in a Nutshell • Case Studies in Applying EDR to Traffic Crash Reconstruction • GM Hybrid and Electric Vehicle Technology and its Relationship to EDR • Motorcycle Modifications and How They Can Affect Your Reconstruction 	
How to Write a Bullet-Proof Expert Report	Apr. 2013
SEAK. Chicago, IL (14 hours)	

<p>Special Problems in Traffic Crash Reconstruction University of North Florida, IPTM. Jacksonville, FL (4 hours)</p> <ul style="list-style-type: none"> • Introduction to HVEDR Technology • Event Data Recorder Update 	<p>May 2012</p>
<p>High-Definition Surveying (3-D Laser Scanning & Cyclone Software) Leica Geosystems. Paramus, NJ (32 hours)</p>	<p>Apr. 2012</p>
<p>How to be an Effective Expert Witness SEAK. Chicago, IL (15 hours)</p>	<p>Apr. 2012</p>
<p>2011 NATARI Combined Conference Harrisburg, PA (24 hours)</p> <ul style="list-style-type: none"> • Pedestrian Collisions 	<p>Oct. 2011</p>
<p>Crash Data Retrieval Update (Ver. 4.1) Crash Data Specialists. Millersville, MD (14 hours)</p>	<p>Sep. 2011</p>
<p>Human Factors in Traffic Crash Reconstruction University of North Florida, IPTM (40 hours)</p>	<p>Sep. 2011</p>
<p>How to Start, Build and Run a Successful Expert Witness Practice SEAK. Falmouth, MA (11 hours)</p>	<p>Aug. 2011</p>
<p>Special Problems in Traffic Crash Reconstruction University of North Florida, IPTM. (28 hours)</p> <ul style="list-style-type: none"> • Event Data Recorder Update (ver. 3.8) • Motorcycle Vs. Car Impacts • Passenger Car Rollovers 	<p>May 2011</p>
<p>2010 Maryland Association of Traffic Accident Investigators Joint Conference Ocean City, MD (24 hours)</p> <ul style="list-style-type: none"> • Heavy Truck Rollovers • Heavy Truck Underrides 	<p>Oct. 2010</p>
<p>2010 Illinois Association of Technical Accident Investigators Conference Bloomington, IL (24 hours)</p> <ul style="list-style-type: none"> • Vehicle Rollovers • Tire Forces • Event Data Recorder Update • Pedestrian Collision Reconstruction 	<p>Sep. 2010</p>
<p>Grade Crossing Collision Investigation International Association of Chiefs of Police (8 hours)</p>	<p>Jul. 2010</p>

Special Problems in Traffic Crash Reconstruction University of North Florida (28 hours)	Apr. 2010
<ul style="list-style-type: none"> • Case Preparation • Planar Impact Mechanics • Instrumentation and Testing for Crash Reconstruction 	
2009 Illinois Association of Technical Accident Investigators Conference Bloomington, IL (24 hours)	Sep. 2009
<ul style="list-style-type: none"> • Critical Speed Yaw Analysis and Lane Change Maneuvers • Crash Testing • Event Data Recorder Update and Validation Testing 	
Emergency Vehicle Operations Simulator Instructor Training Mahwah, NJ (14 hours)	Jun. 2009
National Expert Witness Conference SEAK. Hyannis, MA (14 hours)	Jun. 2009
Special Problems in Traffic Crash Reconstruction University of North Florida, IPTM (28 hours)	Apr. 2009
<ul style="list-style-type: none"> • Event Data Recorder Version 3.1/3.2 Update • Single Image Planar Rectification and Multi-Image and Close-Range Photogrammetry in Crash Reconstruction • The Application of the Searle Throw Distance Formula 	
New Jersey Association of Accident Reconstructionists Joint Conference Atlantic City, NJ (20 hours)	Oct. 2008
<ul style="list-style-type: none"> • Event Data Recorder Update • Critical Speed Yaw • Airborne Testing • Lateral Pole Impact Testing 	
Special Problems in Traffic Crash Reconstruction University of North Florida, IPTM (28 hours)	Apr. 2008
<ul style="list-style-type: none"> • Sudden Acceleration Crash Investigation • Surviving the Deposition • Statistics: A Method to Quantify Uncertainty • Validating the “f” in Searle • Estimating Driver Response Times • What’s New in Event Data Recorders • New Technology in Commercial Vehicles 	
2007 Illinois Association of Technical Accident Investigators Conference Bloomington, IL (24 hours)	Sep. 2007
<ul style="list-style-type: none"> • Momentum Methods • Crash Testing • Computer Animation 	

Energy Methods and Damage Analysis in Traffic Crash Reconstruction University of North Florida, IPTM (40 hours)	Jun. 2007
Special Problems in Traffic Crash Reconstruction University of North Florida, IPTM (28 hours)	Apr. 2007
<ul style="list-style-type: none"> • Pedestrian Collision Testing • Animation • Case Preparation • Pole Impact Testing • Bus/Passenger Vehicle Crash Testing 	
Crash Data Retrieval Data Analyst (Ver. 2.9) Collision Safety Institute (32 hours)	Mar. 2007
Crash Data Retrieval Data Analyst (Ver. 2.8) Collision Safety Institute (24 hours)	Oct. 2006
Crash Data Retrieval Technician Collision Safety Institute (8 hours)	Oct. 2006
Forensic Mapping Systems MJC and Associates (Certified Sokkia Total Station Training, 40 hours)	May 2006
Traffic Crash Reconstruction Update University of North Florida, IPTM (40 hours)	Mar. 2006
AAA Traffic Safety and Crash Investigation Conference Mahwah, NJ (32 hours)	Oct. 2004
Human Bloodstain Patterns The Henry C. Lee Institute of Forensic Science (40 hours)	Jun. 2003
Special Problems in Traffic Crash Reconstruction University of North Florida, IPTM (28 hours)	May 2003
<ul style="list-style-type: none"> • Rollover Testing • Validation of the WinSlam Spin Model • NHTSA Crash Testing 	
Crash Data Retrieval Certification Course Collision Safety Institute (16 hours)	Apr. 2003
Applied Physics for Traffic Crash Investigators University of North Florida, IPTM (40 hours)	Feb. 2002
The Expert Witness and Courtroom Testimony New Jersey Association of Accident Reconstructionists (8 hours)	Nov. 2000
Photogrammetry Using PhotoModeler DeChant Consulting Services (24 hours)	Sep. 2000

Acceleration and VC-2000PC Training Vericom Computers, Inc. (8 hours)	Aug. 2000
Computerized Collision Diagramming University of North Florida, IPTM (40 hours)	Jul. 2000
Inspection and Investigation of Commercial Vehicle Crashes University of North Florida, IPTM (40 hours)	Jun. 2000
The Relationship Between Crush and Energy in Collision Reconstruction New Jersey Association of Accident Reconstructionists (16 hours)	Mar. 2000
Forensic Mapping Specialist MJC and Associates (Certified Sokkia Total Station Training, 40 hours)	Oct. 1999
Motorcycle Accident Investigation University of North Florida, IPTM (40 hours)	Sep. 1999
VC-2000 Operator's Training Vericom Computers, Inc. (8 hours)	Mar. 1999
Certificate in Supervisory Management N.J. Human Resource Development Institute, Rutgers University (320 hours)	Mar. 1997
Police Work Zone Safety (8 hours) Bergen County Police Academy	Jan. 1997
Advanced Accident Reconstruction Texas A&M University, TEEX (40 hours)	Sep. 1996
Catastrophic Aircraft Emergency Seminar Port Authority Police Department (8 hours)	Apr. 1996
Certified Breathalyzer Operator N.J. Dept. Of Law and Public Safety (40 hours)	Sep. 1995
Pedestrian/Bicycle Accident Reconstruction Texas A&M University, TEEX (40 hours)	Sep. 1995
Traffic Accident Reconstruction University of North Florida, IPTM (80 hours)	May 1995
Tire Damage Analysis Michelin Tire Company (8 hours)	Feb. 1995
Advanced Traffic Accident Investigation University of North Florida, IPTM (80 hours)	Mar. 1994
At Scene Traffic Accident Investigation University of North Florida, IPTM (80 hours)	Feb. 1994

Horizontal Gaze Nystagmus National Highway Traffic Safety Administration (24 hours)	May 1993
At Scene Traffic Accident Investigation Bergen County Prosecutor's Office (40 hours)	Mar. 1993
Doppler Radar Operator N.J. Department of Law and Public Safety (80 hours)	Aug. 1988
Police Training Commission Certificate, Basic Police Training Paterson (NJ) Police Academy (880 hours)	Apr. 1988

RESEARCH, CRASH TESTING, AND EXPERIMENTS

- Event Data Recorder Placement Effects on Closing Speed Analysis
- Closing Speed Analysis Using EDR Delta-V, Restitution and Effective Mass Ratio
- Low-Speed Impact Tests to Determine Coefficient of Restitution
- Event Data Recorder Delta-V Validation
- Planar Impact Mechanics
- Critical Speed Yaw
- Balancing Collision Forces Validation Tests
- Lane Change Maneuver
- New Jersey Barrier Impacts
- Three-car Collinear Impacts
- Airborne Vehicle Testing
- Frontal Pole Impact Testing
- Lateral Pole Impact Testing
- Multiple Departure Planar Impact Mechanics
- Drag Sled Validation Tests
- Effects of ABS Braking on Grass
- Pedestrian Crash Testing
- Tractor Trailer Skid Testing
- Motorcycle Sliding Friction
- SLAM/WinCrash Spin Model Validation
- Motor Vehicle Rollovers
- Motor Vehicle Rollover Drag Factor Tests on Turf
- Motor Vehicle Sliding Drag Factors on Grass and Asphalt
- Coefficient of Friction Determination
- Normal Acceleration Rates for Passenger Vehicles
- Bloodstain Pattern Recognition
- Low, Medium and High Velocity Bloodstain Patterns
- Bloodstain Origin Determination
- Bloodstain Volume Estimation
- Truck Underrides
- Rotational Mechanics
- Validation of the Effective Mass Ratio
- Low Closing Speed Restitution Values for Transit Bus/Passenger Vehicle Impacts
- Truck v. Car Collisions
- ABS Brake Testing

PUBLICATIONS

- Author/coauthor of many publications.
- See Publications and Presentations List.

PRESENTATIONS

- Presenter/co-presenter at many accident reconstruction conferences, college, and high schools.
- See Publications and Presentations List.

MEDIA APPEARANCES

- The Accident Investigator, Episodes 1 and 4, The Discovery Health Channel, 2006.
- Legal Affairs Magazine, July/August 2004. “Crash Course. The Science of Reconstructing Car Accidents”.

PROFESSIONAL AFFILIATIONS

- Society of Automotive Engineers;
- National Association of Professional Accident Reconstruction Specialists;
- New Jersey Association of Accident Reconstructionists (Life Member); and
- Ohio Traffic Accident Reconstruction Association (Life Member).