

# **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

### **EXPERIENCE**

#### **Rich Consulting, LLC**

Dec. 2012 to Present

##### *Principal, Accident Reconstructionist*

- More than 2,000 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 Carlson Robotic Total Station for forensic mapping of scenes and vehicle damage
- Utilize Virtual Crash 4 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** 1986 – 1987  
*Auto Mechanic*

### 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

**CloudCompare Course** Nov. 2020  
Ai2-3D (8 hours)

**Virtual Annual Joint Conference** Oct. 2020  
National Association of Professional Accident Reconstruction Specialists (6 hours)

- 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** Oct. 2020  
Ai2-3D (8 hours)

**Tire Pressure Monitoring System Diagnosis and Servicing—Webinar for Technicians** Aug. 2020  
National Institute for Automotive Service Excellence (1 hour)

**TPMS 2020—It’s Not Just the Warning Light Anymore--Webinar for Technicians** Jul. 2020  
National Institute for Automotive Service Excellence (1 hour)

**CCAR’s Hybrid Electric/Electric Vehicle Safety--Webinar for Technicians** May 2020  
National Institute for Automotive Service Excellence (1 hour)

**Electrical Diagnostic Skills & Strategies--Webinar for Technicians** May 2020  
National Institute for Automotive Service Excellence (1 hour)

**EDR Summit** Mar. 2020  
Crash Data Group. Houston, TX (18 hours)

- 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

<b>Virtual Crash Simulation Software</b> Forensic Training Group. Atlanta, GA (24 hours)	Oct. 2019
<b>Operation and Maintenance of Heavy-Duty Vehicle Air Brake Systems and Components</b> Bendix Spicer Foundation Brake, LLC. Elyria, OH (24 hours)	Oct. 2019
<b>Scanning &amp; Software Workshop</b> FARO. Hudson, OH (4 hours)	Mar. 2019
<b>Heavy Vehicle Event Data Recovery and Analysis</b> Commonwealth Transportation Consultants. Charlotte, NC (24 hours)	Feb. 2019
<b>Crash Reconstruction with Video Evidence</b> OTARA. West Chester, OH (6 hours)	Nov. 2018
<b>Pennsylvania State Police Collision Reconstruction Seminar</b> Gettysburg, PA (10 hours)	Oct. 2018
<ul style="list-style-type: none"> <li>• Distracted driving</li> <li>• Acceleration: Lateral, forward, backward, and heavy truck</li> <li>• Role of NTSB and autonomous vehicle crashes</li> <li>• Pedestrian walking speeds</li> <li>• Heavy vehicle event logging devices</li> </ul>	
<b>Symposium on Traffic Safety</b> University of North Florida, IPTM. Clearwater Beach, FL (6 hours)	May 2018
<ul style="list-style-type: none"> <li>• Human factors Research Update</li> <li>• FARO Zone 3D</li> <li>• Using 3D Scanners in Crash reconstruction</li> </ul>	
<b>Traffic Crash Analysis Using Virtual Crash Software</b> Forensic Training Group. Nashville, TN (19 hours)	Mar. 2018
<b>Heavy Truck Crash Reconstruction—Including Digital Forensics</b> Forensic Training Group. Nashville, TN (21 hours)	Feb. 2018
<b>Pennsylvania State Police Collision Reconstruction Seminar</b> Pennsylvania State Police. Gettysburg, PA (4 hours)	Oct. 2017
<ul style="list-style-type: none"> <li>• Results of Human Factors Testing</li> <li>• Heavy Truck Inspections</li> </ul>	
<b>EDR Summit</b> Collision Safety Institute and Collision Publishing. Houston, TX (20 hours).	Mar. 2017
<ul style="list-style-type: none"> <li>• Hyundai/Kia Update</li> <li>• Autonomous Vehicles</li> <li>• Data from Infotainment Systems</li> <li>• Forensic Data from Heavy Vehicle Networks</li> <li>• Toyota Gen 3 Pre-Crash Brake Data</li> <li>• Asynchronous Data Concepts in EDR Data</li> <li>• Atypical Airbag Deployment Cases</li> </ul>	

- Forensic Methods for Dealing with Damaged ECM/ECU Components

**Bridgestone/Firestone Tire Forensics and Accident Investigation Clinic** Dec. 2016  
Bridgestone/Firestone. West Chester, OH (6 hours)

**Optics, Lighting, Visibility and Digital Photography for the Forensic Investigator** Sep. 2016  
Clearly Visible Presentations, LLC. Indianapolis, IN (40 hours)

**Advanced Crash Reconstruction Utilizing Human Factors** May 2016  
North Western University (40 hours)

**Comprehensive Air Brake Systems Training Program** Mar. 2016  
Bendix. Online (3.5 hours)

**CDR Summit** Jan. 2016  
Collision Safety Institute and Collision Publishing. Houston, TX (20 hours)

- 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)

- 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)

- 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)

- 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)

<p><b>Special Problems in Traffic Crash Reconstruction</b>  University of North Florida, IPTM. St. Pete Beach, FL (37 hours)</p> <ul style="list-style-type: none"> <li>• Event Data Recorder Update (ver. 10.2)</li> <li>• CRASH3 in a Nutshell</li> <li>• Case Studies in Applying EDR to Traffic Crash Reconstruction</li> <li>• GM Hybrid and Electric Vehicle Technology and its Relationship to EDR</li> <li>• Motorcycle Modifications and How They Can Affect Your Reconstruction</li> </ul>	May 2013
<p><b>How to Write a Bullet-Proof Expert Report</b>  SEAK. Chicago, IL (14 hours)</p>	Apr. 2013
<p><b>Special Problems in Traffic Crash Reconstruction</b>  University of North Florida, IPTM. Jacksonville, FL (4 hours)</p> <ul style="list-style-type: none"> <li>• Introduction to HVEDR Technology</li> <li>• Event Data Recorder Update</li> </ul>	May 2012
<p><b>High Definition Surveying (3-D Laser Scanning &amp; Cyclone Software)</b>  Leica Geosystems. Paramus, NJ (32 hours)</p>	Apr. 2012
<p><b>How to be an Effective Expert Witness</b>  SEAK. Chicago, IL (15 hours)</p>	Apr. 2012
<p><b>2011 NATARI Combined Conference</b>  Harrisburg, PA (24 hours)</p> <ul style="list-style-type: none"> <li>• Pedestrian Collisions</li> </ul>	Oct. 2011
<p><b>Crash Data Retrieval Update (Ver. 4.1)</b>  Crash Data Specialists. Millersville, MD (14 hours)</p>	Sep. 2011
<p><b>Human Factors in Traffic Crash Reconstruction</b>  University of North Florida, IPTM (40 hours)</p>	Sep. 2011
<p><b>How to Start, Build and Run a Successful Expert Witness Practice</b>  SEAK. Falmouth, MA (11 hours)</p>	Aug. 2011
<p><b>Special Problems in Traffic Crash Reconstruction</b>  University of North Florida, IPTM. (28 hours)</p> <ul style="list-style-type: none"> <li>• Event Data Recorder Update (ver. 3.8)</li> <li>• Motorcycle Vs. Car Impacts</li> <li>• Passenger Car Rollovers</li> </ul>	May 2011
<p><b>2010 Maryland Association of Traffic Accident Investigators Joint Conference</b>  Ocean City, MD (24 hours)</p> <ul style="list-style-type: none"> <li>• Heavy Truck Rollovers</li> <li>• Heavy Truck Underrides</li> </ul>	Oct. 2010
<p><b>2010 Illinois Association of Technical Accident Investigators Conference</b>  Bloomington, IL (24 hours)</p> <ul style="list-style-type: none"> <li>• Vehicle Rollovers</li> </ul>	Sep. 2010

- Tire Forces
- Event Data Recorder Update
- Pedestrian Collision Reconstruction

**Grade Crossing Collision Investigation** Jul. 2010  
International Association of Chiefs of Police (8 hours)

**Special Problems in Traffic Crash Reconstruction** Apr. 2010  
University of North Florida (28 hours)

- Case Preparation
- Planar Impact Mechanics
- Instrumentation and Testing for Crash Reconstruction

**2009 Illinois Association of Technical Accident Investigators Conference** Sep. 2009  
Bloomington, IL (24 hours)

- Critical Speed Yaw Analysis and Lane Change Maneuvers
- Crash Testing
- Event Data Recorder Update and Validation Testing

**Emergency Vehicle Operations Simulator Instructor Training** Jun. 2009  
Mahwah, NJ (14 hours)

**National Expert Witness Conference** Jun. 2009  
SEAK. Hyannis, MA (14 hours)

**Special Problems in Traffic Crash Reconstruction** Apr. 2009  
University of North Florida, IPTM (28 hours)

- 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** Oct. 2008  
Atlantic City, NJ (20 hours)

- Event Data Recorder Update
- Critical Speed Yaw
- Airborne Testing
- Lateral Pole Impact Testing

**Special Problems in Traffic Crash Reconstruction** Apr. 2008  
University of North Florida, IPTM (28 hours)

- 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

<b>2007 Illinois Association of Technical Accident Investigators Conference</b> Bloomington, IL (24 hours)	Sep. 2007
<ul style="list-style-type: none"> <li>• Momentum Methods</li> <li>• Crash Testing</li> <li>• Computer Animation</li> </ul>	
<b>Energy Methods and Damage Analysis in Traffic Crash Reconstruction</b> University of North Florida, IPTM (40 hours)	Jun. 2007
<b>Special Problems in Traffic Crash Reconstruction</b> University of North Florida, IPTM (28 hours)	Apr. 2007
<ul style="list-style-type: none"> <li>• Pedestrian Collision Testing</li> <li>• Animation</li> <li>• Case Preparation</li> <li>• Pole Impact Testing</li> <li>• Bus/Passenger Vehicle Crash Testing</li> </ul>	
<b>Crash Data Retrieval Data Analyst (Ver. 2.9)</b> Collision Safety Institute (32 hours)	Mar. 2007
<b>Crash Data Retrieval Data Analyst (Ver. 2.8)</b> Collision Safety Institute (24 hours)	Oct. 2006
<b>Crash Data Retrieval Technician</b> Collision Safety Institute (8 hours)	Oct. 2006
<b>Forensic Mapping Systems</b> MJC and Associates (Certified Sokkia Total Station Training, 40 hours)	May 2006
<b>Traffic Crash Reconstruction Update</b> University of North Florida, IPTM (40 hours)	Mar. 2006
<b>AAA Traffic Safety and Crash Investigation Conference</b> Mahwah, NJ (32 hours)	Oct. 2004
<b>Human Bloodstain Patterns</b> The Henry C. Lee Institute of Forensic Science (40 hours)	Jun. 2003
<b>Special Problems in Traffic Crash Reconstruction</b> University of North Florida, IPTM (28 hours)	May 2003
<ul style="list-style-type: none"> <li>• Rollover Testing</li> <li>• Validation of the WinSlam Spin Model</li> <li>• NHTSA Crash Testing</li> </ul>	
<b>Crash Data Retrieval Certification Course</b> Collision Safety Institute (16 hours)	Apr. 2003



<b>Applied Physics for Traffic Crash Investigators</b> University of North Florida, IPTM (40 hours)	Feb. 2002
<b>The Expert Witness and Courtroom Testimony</b> New Jersey Association of Accident Reconstructionists (8 hours)	Nov. 2000
<b>Photogrammetry Using PhotoModeler</b> DeChant Consulting Services (24 hours)	Sep. 2000
<b>Acceleration and VC-2000PC Training</b> Vericom Computers, Inc. (8 hours)	Aug. 2000
<b>Computerized Collision Diagramming</b> University of North Florida, IPTM (40 hours)	Jul. 2000
<b>Inspection and Investigation of Commercial Vehicle Crashes</b> University of North Florida, IPTM (40 hours)	Jun. 2000
<b>The Relationship Between Crush and Energy in Collision Reconstruction</b> New Jersey Association of Accident Reconstructionists (16 hours)	Mar. 2000
<b>Forensic Mapping Specialist</b> MJC and Associates (Certified Sokkia Total Station Training, 40 hours)	Oct. 1999
<b>Motorcycle Accident Investigation</b> University of North Florida, IPTM (40 hours)	Sep. 1999
<b>VC-2000 Operator's Training</b> Vericom Computers, Inc. (8 hours)	Mar. 1999
<b>Certificate in Supervisory Management</b> N.J. Human Resource Development Institute, Rutgers University (320 hours)	Mar. 1997
<b>Police Work Zone Safety (8 hours)</b> Bergen County Police Academy	Jan. 1997
<b>Advanced Accident Reconstruction</b> Texas A&M University, TEEX (40 hours)	Sep. 1996
<b>Catastrophic Aircraft Emergency Seminar</b> Port Authority Police Department (8 hours)	Apr. 1996
<b>Certified Breathalyzer Operator</b> N.J. Dept. Of Law and Public Safety (40 hours)	Sep. 1995
<b>Pedestrian/Bicycle Accident Reconstruction</b> Texas A&M University, TEEX (40 hours)	Sep. 1995
<b>Traffic Accident Reconstruction</b> University of North Florida, IPTM (80 hours)	May 1995

<b>Tire Damage Analysis</b> Michelin Tire Company (8 hours)	Feb. 1995
<b>Advanced Traffic Accident Investigation</b> University of North Florida, IPTM (80 hours)	Mar. 1994
<b>At Scene Traffic Accident Investigation</b> University of North Florida, IPTM (80 hours)	Feb. 1994
<b>Horizontal Gaze Nystagmus</b> National Highway Traffic Safety Administration (24 hours)	May 1993
<b>At Scene Traffic Accident Investigation</b> Bergen County Prosecutor's Office (40 hours)	Mar. 1993
<b>Doppler Radar Operator</b> N.J. Department of Law and Public Safety (80 hours)	Aug. 1988
<b>Police Training Commission Certificate, Basic Police Training</b> 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).