



CURRICULUM VITAE
NICHOLAS J. FAMIGLIETTI, BSME

SPECIALIZATION

- Crash Data Recorder
- Accident Reconstruction
- Crash Testing
- Mechanical Failure Analysis
- Commercial Vehicles
- Computer Simulation and Animation
- Vehicle Dynamics and Loss of Control
- Visibility Studies

EDUCATION

- Bachelor of Science in Mechanical Engineering (BSME)
Tufts University, Medford MA (May 2016)

CERTIFICATIONS

- SAE – Accident Reconstruction Certificate, September 2019
- CDR – Data Analyst, May 2017
- CDR – Technician, May 2017

ADDITIONAL TRAINING

- SAE, Photogrammetry and Analysis of Digital Media, September 2019
- SAE, Introduction to Highly Automated Vehicles, July 2019
- SAE, Applying Automotive EDR Data to Traffic Crash Reconstruction, June 2019
- SAE, LIDAR and Infrared Cameras for ADAS and Autonomous Sensing, April 2019
- Engineering Dynamics Corporation – HVE Forum, February-March 2019
- SAE, Accident Reconstruction, the Autonomous Vehicle and ADAS, January 2019
- SAE, Applied Vehicle Dynamics, December 2018
- SAE, Accessing and Interpreting Heavy Vehicle Event Data Recorders, October 2018
- Creative Photo Academy Photography Boot Camp, July-August 2018
- Tesla EDR Training, June 2018
- CA2RS 2nd Quarter Training, June 2018
- PC-Crash Training Course, January 2018
- Engineering Dynamics Corporation – Reconstruction Training Course, January 2018
- SAE, Vehicle Crash Reconstruction: Principles and Technology, December 2017
- ARC-CSI Fall Conference, September 2017
- CA2RS 2017 3rd Quarter Training, August 2017
- Collision Safety Institute – CDR Data Analyst Training, May 2017
- Collision Safety Institute – CDR Technician Training, May 2017
- SATAI Spring Conference, March-April 2017
- FARO Academy Forensic Workshop, November 2016

PROFESSIONAL EXPERIENCE

2016 to present

Momentum Engineering Corp.

Forensic Engineer

Accident investigation and reconstruction of heavy truck, automobile, bicycle, motorcycle, and pedestrian collisions. Engineering services including vehicle and site inspections utilizing laser measurement, event data recorder access and

interpretation, digital photography and video, measurement. Crash testing, re-enactments, visibility studies, traffic signal analysis, vehicle dynamics, rollover dynamics, mechanical failure analysis, and design evaluation. Extensive use of computer-based analysis and simulation (PC-Crash and HVE), as well as momentum and energy-based equations.

TECHNICAL BACKGROUND

Accident Reconstruction:

Reconstruction of automobile, heavy truck, bus, bicycle, motorcycle, and pedestrian accidents. Collision analysis, scene investigation and drawings, skid and crush analysis, photography, vehicle inspection, velocity/damage analysis, and vehicle dynamics analysis. Design and execution of full-scale vehicle crash tests, vehicle dynamics testing and data analysis. Computer-based accident reconstruction using PC-Crash and HVE. Brake, engine, transmission, and suspension failure analysis. Analysis of passenger and commercial vehicle event data recorder systems and data.

Computer and Classical Analysis:

Finite element modeling and stress analysis.

Design Evaluation:

Mechanical systems and components performance evaluation.

Automotive:

Diagnostics, brakes, steering, engines, cooling systems, clutches, transmissions, drive train, suspension, frame, noise/vibration/harshness (NVH). Design and function of plug-in electric vehicle tractive systems.

High Performance Experience:

Assisted in the design and testing of Formula Hybrid electric open-wheel racecar, for four years. Designed and fabricated frame, battery enclosure, tractive system, occupant protection systems, and suspension. Captain of Tufts Racing 2015-16.

PROFESSIONAL AFFILIATIONS

- Society of Automotive Engineering
- Southwest Association of Technical Accident Investigation
- California Association of Accident Reconstruction Specialists

AWARDS AND ACCOMPLISHMENTS

- Tufts University
 - Graduated Magna Cum Laude, May 2016
 - Dean's List: Fall 2012, Spring & Fall 2013, Spring & Fall 2013, Spring & Fall 2015
- Eagle Scout, February 2013

ADDITIONAL TRAINING DETAIL

- SAE, Photogrammetry and Analysis of Digital Media, September 2019
 - Photographs and video recordings of vehicle crashes and accident sites are more prevalent than ever, with dash mounted cameras, surveillance footage, and personal cell phones now ubiquitous. The information contained in these pictures and video provide critical information to understanding how crashes occurred, and in analyzing physical evidence. This course teaches the theory and techniques for getting the most out of digital media, including correctly processing raw video and photographs, correcting for lens distortion, and using photogrammetric techniques to convert the information in digital media to usable scaled three-dimensional data. Hands-on training using actual case studies and a variety of software titles such as 3D Studio Max, PTLens, Photoshop, and PFTrack, introduces the students to the latest techniques.

- SAE, Introduction to Highly Automated Vehicles, July 2019
 - An overview of the enabling advanced driver assistance systems and how they integrate with existing passive occupant crash protection systems; how ADAS functions perceive the world, make decisions, and either warn drivers or actively intervene in controlling the vehicle to avoid or mitigate crashes. Examples of current and future ADAS functions, various sensors utilized in ADAS, including their operation and limitations, and sample algorithms, were discussed and demonstrated. A combination of hands-on activities, including computer simulations, discussion and lecture.

- SAE, Applying Automotive EDR Data to Traffic Crash Reconstruction, June 2019
 - A review of skills necessary to analyze EDR data that has already been imaged, apply it to crash reconstruction, and reconcile it with calculations using other data sources. Analysis of any current and future EDR data set without regard to manufacturer. Presentation of a generic analysis step by step, then grouping of EDRs into manufacturer-specific families and their data limitations and case studies that highlight targeted key learning objectives. Frye and Daubert requirements for EDR data to be admissible, and methods of presenting EDR data that will communicate the data understandably to attorneys and lay juries.

- SAE, LIDAR and Infrared Cameras for ADAS and Autonomous Sensing, April 2019
 - A review of infrared basics - electromagnetic spectrum, spectral irradiance, night vision, and eye safety. LIDAR – flash, scanning, wavelengths, lasers, detectors, scanners, range and resolution calculations, optics, thermal design, challenges to automotive qualification and sensor fusion. Infrared camera topics with a focus on driver monitoring for interior and machine vision for exterior. Rolling and global shutter imagers, wavelength selection, use of secondary optics, continuous vs pulsed IRED operation, thermal design, power consumption, eye safety certification, and HMI considerations. A brief review of iris recognition, cabin monitoring, and face recognition. A discussion on trends and challenges facing optical sensing in autonomous vehicles.

- HVE Forum, February-March 2019
 - *Learn* how to use the latest features and capabilities of *HVE*, *HVE-2D*, and *HVE-CSI*. A selection of workshops, designed for beginning, intermediate and advanced users, covering various topics and functionality of HVE and its application to traffic accident reconstruction. User's Group meetings, the *HVE* White Paper Session.
- SAE, Accident Reconstruction, the Autonomous Vehicle and ADAS, January 2019
 - Summary of what technology exists, both in current production and under development. Identification of applicable state and federal regulations. Exploration of the ethical and societal implications of the technology. Definitions of performance parameters based on currently available standards and protocols. Formulation of a plan to approach accident reconstruction using the new technology
- SAE, Applied Vehicle Dynamics, December 2018
 - Twelve modules devoted to key the fundamental principles associated with longitudinal and lateral vehicle dynamics. Each focused classroom session is paired with an on-track exercise to immediately reinforce these concepts with a dedicated behind the wheel driving session, effectively illustrating these principals in the real world.
- SAE, Accessing and Interpreting Heavy Vehicle Event Data Recorders, October 2018
 - Identify potential sources of HVEDR data available on commercial vehicles. Utilize various methodologies for accessing and imaging data from HVEDRs while preserving the data in its original electronic format with the control module. Compile documentation of the vehicle and the imaged HVEDR data to properly establish foundational facts that tie the data to the vehicle and to ensure the reliability of the incident specific data. Properly interpret data from HVEDR's and understand the limitations of this data. Analyze HVEDR data in the context of collision reconstruction.
- Creative Photo Academy Photography Boot Camp, July-August 2018
 - Learn the functions/controls of the camera and honing the photographic thought process. Shutter speed, f-stop, aperture, zoom; composition and image design; creative exposure, light metering, and proper exposure; light, ISO, shutter speed, color; electronic flash, depth of field; filters.
- Tesla EDR Training, June 2018
 - Training on the use of the Tesla restraint control module.
- CA2RS 2nd Quarter Training, June 2018
 - Bicycle accident reconstruction. Techniques, research, human factors. Analysis of evidence. Key issues in bicycle-involved personal injury litigation.

- PC-Crash Training Course, January 2018
 - Learn and navigate through the UI of PC-Crash. Apply engineering concepts and simulate real-world cases.
- Engineering Dynamics Corporation – Reconstruction Training Course, January 2018
 - Key concepts of how the physics calculation routines in EDCRASH work. Apply to real-world cases and present results. CDC, PDOF, and damages measurements. Calculation procedures, trajectory simulation and linear momentum. HVE Execution Environment.
- SAE, Vehicle Crash Reconstruction: Principles and Technology, December 2017
 - Describe basic evidence documentation techniques. Recognize the different types of evidence produced by the different collision types. Describe the basic mechanics of collision. Summarize the principles of planar impact mechanics and crush analysis. Describe forms of analysis applicable to each collision type. Summarize the empirical data available in the literature for each collision type.
- ARC-CSI Fall Conference, September 2017
 - Discussion of crush analysis. Discussion and examples of disputed red light accidents.
- CA2RS 2017 3rd Quarter Training, August 2017
 - Discussion of crush analysis. Discussion of disputed red light accidents; function of traffic signals; witness statements.
- Collision Safety Institute – CDR Data Analyst Training, May 2017
 - Insight into the function of the automobile Event Data Recorder (EDR) function or subcomponent, its history, and evolution as well as expanded interpretation skills enabling the application of a Bosch Crash Data Retrieval (CDR) Tool generated report to a situationally complete crash reconstruction.
- Collision Safety Institute – CDR Technician Training, May 2017
 - Training on the use of the Bosch Crash Data Retrieval system to collect electronic data from event data recorders installed in vehicles.
- SATAI Spring Conference, March-April 2017
 - Presentations on motorcycle accident reconstruction, road design, safety, and disputed red light accidents.

- FARO Academy Forensic Workshop, November 2016
 - Evaluate laser scanners versus total stations and other traditional, measurement techniques. Discover how to set up a scanner and begin measuring and documenting a scene. Watch field-to-finish demonstrations of the latest 3D laser scanning technologies. Explore how to use software to create accurate, courtroom exhibits from point clouds. Engage in demonstrations of the most-used, forensic diagramming and animation software packages including FARO CrimeZone, FARO Reality, FARO CrashZone, and FARO SCENE.

NOT FOR DESIGNATION