Beau A. Biller, M.Eng., P.E.

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Personal:
Born July 2, 1980, Clearwater, Florida

Education:
B.S. - Florida State University, Tallahassee, FL
Mechanical Engineering with emphasis on Mathematics, Materials Science and Physics
M.Eng with Honors – Johns Hopkins University, Baltimore, MD (Summa Cum Laude)
Mechanical Engineering and Applied Physics
Pursuing: **Doctorate of Physics**

Professional:
Licensed Professional Engineer
Full Accreditation as a Traffic Accident Reconstructionist by the Accreditation
Commission for Traffic Accident Reconstruction. (ACTAR # 1951)
sUAS Aircraft Pilot rating

Professional Memberships:
NATARI - National Association of Traffic Accident Reconstructionist and Investigators
SAE - Society of Automotive Engineers
ASME - American Society of Mechanical Engineers

Conference and Course Attendance:

- **Crash Data Recorder Tool** – User Certification Course; IPTM, University of North Florida; August 2004
- **Traffic Accident Reconstruction I**, Northwestern University, Evanston, IL; October 2004
- **Traffic Accident Reconstruction II**, Northwestern University, Evanston, IL; November 2004
- **Commercial Vehicle Braking Systems**, Society of Automotive Engineers Seminar, Detroit Michigan; April 2005
- **Vehicle Accident Reconstruction Methods**, Society of Automotive Engineers Seminar, Detroit Michigan; April 2005
- **Applied Vehicle Dynamics**, Society of Automotive Engineers, Big Beaver, Pennsylvania; May 2006
- **Photo Modeler Collision Reconstruction Training**, EOS Systems, Atlanta, Georgia; November 2007
- **Stapp Car Crash Conference,** Savannah, Georgia; November 2009

- **Occupant Kinematics,** IPTM, Orlando, Florida; April 2010
- **Crash Data Retrieval Update 2010,** IPTM, Orlando, Florida; April 2010
- **Special Problems in Traffic Crash Reconstruction,** IPTM, Orlando, Florida; April 2010
- **MADYMO Introductory Course,** TASS, Detroit, Michigan; June 2010
- **ARC-CSI Crash Conference,** Las Vegas, NV; June 2012
- **Motorcycle Endorsement Course,** Monticello, FL; February 2013
- **3DS MAX Modeling,** Virtual Design & Construction Institute; December 2013
- **CDR Summit,** Houston, TX; January 2014
- **Forensics Engineering,** Decatur Professional Development, LLC; May 2015
- **59th Stapp Car Crash Conference**, New Orleans, LA; November 9-11, 2015
- **Electrical Engineering for HVAC Engineers**, PDH Engineer; November 2016
- **Air Conditioning System**s, PDH Engineer; November 2016
- **Welding Technology and Inspection Procedures,** PDHonline; August 2017
- **Human Factors in Traffic Crash Reconstruction,** IPTM, University of North Florida; February 2018
- **Introduction to Brake Control Systems,** Society of Automotive Engineers; March 2018
- **Mechanics of Materials,** PDHonline; December 2018
- **MATLAB Onramp,** MathWorks Training Services; March 2019
- **Signalized Intersections Part I,** PDHonline; August 2020
- **Signalized Intersections Part II,** PDHonline; August 2020
- **Structural Mechanics,** PDHonline; February 2021
- **Understanding the Manual on Uniform Traffic Control Devices,** PDHonline; November 2022
- **Event Data Recorder Use in Traffic Crash Reconstruction I**, IPTM; November 2022
- **Commercial Vehicle Crash Investigation,** IPTM; February 2023

Experience:

Cummings Scientific, LLC, Tallahassee, Florida; Engineering, Accident Reconstruction, Failure Analysis, Human Factors; 2007-Present

- Reconstruction of vehicular accidents; dynamic and kinematic analysis; analysis of vehicle dynamics due to tire failure; brake inspections, skid coefficients; lamp filament analysis; computer analysis; momentum exchange; vehicle crush energy calculations; visibility analysis; occupant restraint analysis; occupant kinematics and dynamics; automobile, truck, motorcycle, bicycle, and pedestrian accidents.
- Engineering Management
- Downloading and interpretation of vehicle CDR data.
- Product failure analysis; accident and injury analysis; safety standards compliance analysis.
- Interpretation of commercial vehicle ECM data.
- Mathematical modeling of vehicular accidents and occupant kinematics.
- Computer modeling of vehicular accident and occupant kinematics.

- MADYMO Simulations
- Computer Animations
- Finite Element Analysis
- Vehicle crash testing
- Vehicle accident re-enactments
- Advanced Photogrammetry and Photogrammetric Modeling
- HVAC systems analysis
- Human Factors and Visibility Analysis
- Drone assisted aerial photography and scene mapping

Johns Hopkins University, Baltimore, Maryland; Teaching, Course Development and Planning; 2021-Present

- Assistant instructor for graduate courses in: Classical and Analytical Mechanics, Quantum Mechanics, Statistical Mechanics, Astrophysics, Cosmology, and General Relativity.
- Development of course lectures.
- Creation of student assignments, exams, and solution sets.
- Assignment and exam grading/student feedback.
- Hosting office hours and lecture sessions.

Engineering Investigations, LLC, Tallahassee, Florida; Engineering, Accident Reconstruction, & Safety Analysis; 2007-2009

- Reconstruction of vehicular accidents; dynamic and kinematic analysis; analysis of vehicle dynamics due to tire failure; brake inspections, skid coefficients; lamp filament analysis; computer analysis; momentum exchange; occupant restraint analysis; occupant kinematics and dynamics; automobile, truck, motorcycle, bicycle, and pedestrian accidents.
- Inspection of commercial vehicle braking systems.
- Downloading and interpretation of vehicle CDR data.
- Product failure analysis; accident and injury analysis; safety standards compliance analysis.
- Finite Element Analysis
- Vehicle accident re-enactments
- Advanced Photogrammetry

Quest Engineering and Failure Analysis, Tallahassee, Florida; Engineering, Accident Reconstruction; 2004-2007

- Reconstruction of vehicular accidents; dynamic and kinematic analysis; skid coefficients; lamp filament analysis; tire failure analysis; computer analysis; momentum exchange; vehicle crush energy calculations; visibility analysis; occupant restraint analysis; occupant kinematics and dynamics; automobile, truck, motorcycle, bicycle, and pedestrian accidents.
- Inspection of commercial vehicle braking systems.

- Downloading and interpretation of vehicle CDR data.
- Mathematical modeling of vehicular accidents and occupant kinematics.
- Computer modeling of vehicular accident and occupant kinematics.
- Vehicular accident re-enactments.
- Vehicle crash testing

Florida State University, Tallahassee, Florida; Advanced Engineering Dynamics, Teaching/Research Assistant; 2002-2003

- Research in the Advanced Materials Laboratory
- Engineering materials testing and research
- Computer FEA analysis
- Member of "Team Rancho" vehicular sub-frame design team

Skills:

- **Accident Reconstruction** - Reconstruction of automobile, heavy truck, bus, heavy equipment, tractor-trailers, trains, motorcycles, ATVs, bicycles, and pedestrian accidents. This includes the analysis of accident events and physical evidence to determine causation, critical accident events, sequence of events, compliance with procedures, and injury mechanisms. Typical projects include vehicular, construction, and slip/trip & fall accidents.

- **Product Failure Analysis** - Analysis of specific projects with regard to materials failure, fatigue, corrosion, safety and design.

- **Computer based accident reconstruction and simulations** - Using HVE, EDCrash, PC Crash, EDSMAC, MADYMO and physics based simulation programs.

- **Crash testing** - Data acquisition, crush analysis and reduction.

- **Investigative services** - Scene investigation, surveys, and drawings, skid analysis, photography, vehicle inspection, damage analysis, vehicle dynamics.

- **Photogrammetry** of digital and scanned photos using a variety of CAD programs, Photomodeler, and Autodesk ReCap to analyze skid patterns, crush depths, and accident scenes.

- **Finite Element Analysis** - Using state of the art mechanical modeling programs.

- **Computer Aided Modeling –** Vehicle and machine part modeling using a variety of CAD programs.

- **Animations –** Creating still frame and video renderings for accurate visual representations

- **Human factor analysis** - Human perception and reaction times, visibility and conspicuity analysis.

- **Seat Belt Analysis** - Engineering analysis of material evidence to determine if seat belts were operational and if occupants were wearing their seat belts.

Significant Undergraduate Coursework:

Mathematics - Probability and Statistics, Calculus I, II, &III, Linear Algebra, Ordinary and Partial Differential Equations.

Applied Physics and Engineering - Chemistry with Laboratory Experience, Electricity and Magnetism with Laboratory Experience, Statics, Dynamics, Feedback and Control Systems, Mechanics of Materials, Materials Science with Laboratory Experience, Thermodynamics with Laboratory Experience, General and Special Relativity, Quantum Mechanics, Quantum Field Theory.

Significant Graduate Coursework:

Mathematics - Linear Algebra, Advanced Engineering Mathematics and Modeling, Ordinary and Partial Differential Equations, Complex Analysis, Group Theory, Fourier Analysis, Numerical Methods, Variational Calculus, Differential Geometry.

Applied Physics and Engineering - Applied Finite Element Analysis and Modeling, Computer Aided Modeling, Symmetries of Crystalline Solids, X-Ray Crystallography and Diffraction Analysis, Advanced Strength of Materials, Energy Methods in Structural Analysis, Asymmetric Structural Failures, Linear and Non-Linear Dynamic Systems, Analytical (Lagrangian and Hamiltonian) Mechanics, Random Data Analysis, Spectral Analysis, Digital Filtering, Statistical Modeling, Advanced Thermodynamics and Statistical Mechanics, Quantum Mechanics and Field Theory, Relativistic Physics.

Presentations and Talks:

- Biller, B. A., Accident Reconstruction. Continuing education course at Kubicki Draper's 2008 Annual Claims Conference. January 2008, Kissimmee, FL.

- Biller, B. A., Nationwide Insurance Company Claims Examiner Seminar. CE credits given by the Florida Department of Financial Services. February 6, 2008, Pensacola, FL.

- Biller, B. A., Auto-Owners Insurance Claims Examiner Seminar. CE credits given by the Florida Department of Financial Services. February 19, 2008, Tallahassee, FL.

- Osterholt, G.D., Biller, B.A., The Application of MADYMO to the Modeling of Real World Accidents. ARC-CSI Crash Conference. June 2012, Las Vegas, NV.

- Biller, B.A., MADYMO User Meeting, University of Michigan Traffic Accident Reconstruction Institute. September 2016, Ann Arbor, MI.

- Biller, B.A., Working with Experts. Presented by The Criminal Law Section. Chair-Catherine R. Henry. February 21, 2020, St. Petersburg Yacht Club, FL.

Publications:

- Cummings, J.R., Osterholt, G.D., Calhoun, D.V., Biller, B.A., Occupant Friction Coefficients on Various Combinations of Seat and Clothing. SAE, 2009. 2009-01-1672

- Biller, B.A., Cummings, J.R., Photogrammetry in Accident Reconstruction. Florida Engineering Journal, June Issue 2010.

- Osterholt, G.D., Cummings, J.R., Calhoun, D.V., Biller, B.A., Updating Generic Crush Stiffness Coefficients for Accident Reconstruction. SAE, 2010. 2010-01-1581.

- Cummings, J. R., Fletcher, H. J., Biller, B. A., Scanlan, S., Lamb, R., & Russo, M. D. (2016). Estimates of Motorcycle Speed Made By Eyewitnesses Under Ideal Experimental Conditions. *Accident Reconstruction Journal*, 12–17.