Who Should Attend
This seminar is intended for design, analysis, test or production engineers who deal with threaded fasteners. Although the seminar content was developed for engineers, the material would also be useful to others who deal with threaded fasteners including designers, technicians, production and maintenance supervisors and managers.

Prerequisites
The attendee needs little if any previous experience with threaded fasteners. The attendee should have completed the standard undergraduate courses in stress analysis and material science.

Topical Outline
PART 1 - Geometry, Materials and Standards
- Introduction
  - Bolts, rivets and pins
  - Are you breaking fasteners?
  - Do you have a happy joint?
- Geometry
  - Threaded fastener -- Head, threads
  - Nuts
  - Washers and other elements
- Materials and Manufacturing
  - Material Properties & Fastener Testing
  - Fastener Grades and Classes
  - Nut Grades and Classes
  - Selection Nut & Fastener
- Forming Method
- Coatings and Finishes
- Other Fastener Material

PART 2 - Behavior of the Bolted Joint
- Joint Diagram
  - Introduction
  - Behavior - Axial Loading
  - Preload and Clamp Load
  - Joint Constant
  - Separation
- Joint Diagram
  - Hard vs. Soft Joint
  - Application of Joint Diagram
  - Application of external load
  - Determination of separation load
- Axial and shear loading
- Non-linear member behavior
- Non-linear fastener behavior
- Loss of preload due to embedment
- Joint Analysis
  - Joint Preload
  - Overall Strategy
  - Considerations in Selection of Preload
  - Selection of Preload

PART 3 - Loads and Environment
- Fatigue and Fracture
  - Ductile vs. Brittle Fracture
- Fatigue
- Methods to Improve Fatigue Performance
- Relative Importance of Sources
- Hydrogen Embrittlement
- Stress Corrosion Cracking
- Loading of the Fastener
- Applications of Fasteners
- Loading of the Joint - Axial, shear, torsion, thermal
- Loading of the Member -- Contact stress; creep and stress relaxation; thread loading

PART 4 - Preload and Assembly
- Control of Preload
  - Methods to Control Preload
  - Tools
  - Potential Assembly Problems
- Control of Preload
  - Torque Control
  - Stretch Control
- Tension Control
  - Turn Control
- Torque-Turn Control
  - Yield Control

Instructor: Jess J. Comer
Fee $1265      1.3 CEUs

Tire and Wheel Safety Issues
1 Day
I.D.# C0102

One of the most important safety critical components on cars, trucks, and aircraft is the pneumatic tire. Vehicle tires primarily control stopping distances on wet and dry roads or runways and strongly influence over-steer/under-steer behavior in handling maneuvers of cars and trucks. The inflated tire-wheel assembly also acts as a pressure vessel that releases a large amount of energy when catastrophically deflated. The tire can also serve as a fulcrum, both directly and indirectly, in contributing to vehicle rollover. This seminar covers these facets of tire safety phenomena. Engineering fundamentals are discussed and illustrated with numerous practical examples and case studies of current public interest.

The Pneumatic Tire, a 700-page E-book on CD, edited by Joseph Walter and Alan Gent is included in the course material.

Learning Objectives
After completing this seminar attendees will be able to:
- Describe the most important performance parameters and operating conditions of pneumatic tires related to safety.
- Use fundamental equations of engineering science to predict and/or explain tire-vehicle interactions related to safety.

Who Should Attend
This course is designed principally for technical professionals in the automobile, tire, and wheel industries and their suppliers. In addition, some case studies and examples involve truck, agriculture, and aircraft tires.

Prerequisites
An undergraduate degree in a technical field or commensurate experience is desirable.
Topical Outline

- Introduction
- Vehicle accident statistics
- The role of the tire in accident prevention/causation
- Tire construction features
- Tire failure modes
- Tire Grip and Related Phenomena
- Tire-road friction characteristics
- Tire braking forces
- Factors influencing vehicle stopping distance
- Combined braking and cornering
- Hydroplaning
- High speed behavior and standing waves
- Brake Performance
  - Front wheel/rear wheel lock-up
  - Braking efficiency
  - Anti-lock braking and other systems
- The Tire as a Pressure Vessel
  - Burst pressure
  - Energy release in punctured tires
  - Wheel issues
  - Tire and/or wheel case studies
- Over-steering Vehicles
  - Meaning of under-steer coefficient
  - The contribution of the tire
- Vehicle Rollover Analysis
  - History of rollover
  - Rollover threshold
  - Tripping mechanisms
  - Tire effects
  - Operating conditions
  - Public policy issues

Instructor: Joseph D. Walter
Fee $725
7 ACTAR CEUs

Vehicle Braking Performance: Stopping Distance Fast Track
I.D.#PD230826ON (Online delivery)

Stopping Distance is one of the most common metrics of a vehicle’s braking performance and one of the most critical attributes of accident prevention and minimization. The measurements are used within the development of the vehicle and are a critical aspect of accident prevention, accident reconstruction, and overall occupant and pedestrian safety management. While the results of this metric are published in a variety of sources, the factors that differentiate vehicle performance, vehicle dynamics, and calculation of the braking performance required to achieve desired performance are not widely available.

Major topics include:
- Calculation of Stopping Distance
- Common Procedures Used to Assess Stopping Distance
- Performance Metrics Compared to Target Avoidance
- Determination and Generation of Forces Necessary to Stop a Vehicle
- Contributions and Limitations

Is this Fast Track for you?
The Vehicle Braking Performance: Stopping Distance Fast Track would be of value to anyone involved in the validation of a braking system, either in the development of the validation plan or the execution of the validation plan. Those involved in accident reconstruction and accident prevention would benefit from an understanding of the techniques, principles, contributing factors and limitations of stopping performance to improved vehicle and road system design. This course would also be of value to those involved in vehicle marketing -- a detailed understanding of the metric's generation and contributing effects will insure that promotion and comparison is done in a qualified manner.

What You Will Receive
- Three months of online access to the 70 minute presentation
- Integrated knowledge checks to reinforce key concepts
- Proof of Participation

Instructor: Thomas J. Hall
Fee $109

Vehicle Braking Performance: Braking Confidence and Pedal Feel Fast Track
I.D.#PD230912ON (Online delivery)

Braking confidence and pedal feel are important braking performance attributes that should be optimized to achieve customer satisfaction with a vehicle's braking system. The relationship between the input force and travel provided by the driver to achieve the desired vehicle deceleration is as core to the vehicle personality or DNA as ride, handling, or driveability. This Fast Track will cover the main concepts and methods needed for tuning brake systems to desired pedal force and travel characteristics.

Major topics include:
- Introduction to Braking Confidence
- Input Force to Vehicle Deceleration Relationship
- Input Travel to Vehicle Deceleration Relationship
- Parametric Analysis
- Environmental Effects
- Emerging Trends Affecting Braking Confidence

Is this Fast Track for you?
The Vehicle Braking Performance: Braking Confidence and Pedal Feel Fast Track would be of value to anyone involved in the validation of a braking system, either in the development of the validation plan or the execution of the validation plan. This course would also be of value to those involved in vehicle marketing -- a detailed understanding of the metric's generation and contributing effects will insure that promotion and comparison is done in a qualified manner.

What You Will Receive
- Three months of online access to the 60 minute presentation
- Integrated knowledge checks to reinforce key concepts
- Proof of Participation

Instructor: Thomas J. Hall
Fee $109
Accelerated Test Methods for Ground and Aerospace Vehicle Development

2 Days  
I.D.# C0316

Engineers and managers involved with product development are constantly challenged to reduce time to market, minimize warranty costs, and increase product quality. With less and less time for testing, the need for effective accelerated test procedures has never been greater. This course covers the benefits, limitations, processes, and applications of several proven accelerated test methods including accelerated reliability, step stress, FSLT (Full System Life Test), FMVTÂ® (Failure Mode Verification Testing), HALT (Highly Accelerated Life Testing), and HASS (Highly Accelerated Stress Screening). A combination of hands-on exercises, team activities, discussion, and lecture are used throughout the course.

Participants will also receive a copy of the instructor’s book, *Accelerated Testing and Validation Management*, which includes numerous hands-on exercises and a CD with analytical spreadsheets.

Attendees are requested to bring a calculator to the seminar.

Learning Objectives

By attending this seminar, you will be able to:
- Choose the accelerated test method for a given application
- Analyze accelerated testing results
- Explain how to accelerate one’s current test methods
- Explain how to accelerate one’s validation program
- Adjust accelerated test programs for business situations
- Describe how product development cycles can be reduced from 18 to 6 months

Who Should Attend

This seminar is designed for anyone involved in product design, life testing, reliability testing and validation for passenger cars, light trucks, heavy duty, off-highway or aerospace vehicles, including reliability engineers, validation engineers, design engineers and their managers. Individuals who need to achieve shorter time to market or higher quality through custom test plans will find this course to be especially valuable. Purchasers or users of testing or engineering services will also find this course to be valuable. There are no prerequisites for this course although a technical background is helpful.

Topical Outline

- Statistical model for reliability testing
- Fundamentals of a statistical reliability test
- Effects of automotive supply chain on sample size and duration
- Common pitfalls
- Examine and solve two or three real life statistical data set problems

Accelerated Test Methods for Ground and Aerospace Vehicle Development e-Seminar

I.D.#PD130624ON (Online delivery)

This course offers more than 10 hours of instruction divided into fourteen modules; a coordinated handbook; and a copy of the instructor’s book, *Accelerated Testing and Validation Management*, which includes numerous hands-on exercises and a CD with analytical spreadsheets. Convenient, portable, and with core content from the instructor-led seminar (content and description immediately preceding), the e-seminar program options offer new and alternative ways to receive the same instruction as the live classroom learning without the expense of travel and time away from the workplace.

View the complete program brochure and online demo at http://www.sae.org/e-seminars/atm.

What You Will Receive:
- 365 Day access through MyLearn.sae.org
- Links to streaming video modules
- Course Handbook (downloadable .pdf’s, subject to DRM)
Practical NVH Signal Processing Methods

2 Days
I.D.# C0431

Signal processing has become a critical tool in optimizing vehicle noise. This seminar will help you to understand the foundation common to all NVH data acquisition equipment including digitizing, windows, aliasing, averaging techniques, and common analysis functions such as the power spectrum, transfer function and coherence. Fundamental concepts such as filtering, modulation, convolution, and correlation, as well as specialized techniques used in rotating machinery such as adaptive re-sampling and order tracking, will be covered. The seminar will also cover multi-input multi-output (MIMO) signal processing, array based solutions for force identification, source and path characterization and data visualization. Brief introductions to emerging concepts will also be explored and computer demonstrations, physical experiments and case studies will be used to illustrate applied, real-world problems.

Learning Objectives
By attending this seminar, you will be able to:
• Explain the fundamental controls typical in modern spectrum analysis tools
• Interpret NVH data and judge its relevance to physical phenomena
• Extract new types of useful information from NVH data
• Implement new signal processing techniques

Who Should Attend
NVH technicians, engineers and managers who want to understand how NVH data is produced and interpreted will find this seminar valuable. The material is presented at a level suitable for beginners, but offers the more experienced practitioners new insight into the concepts presented through the illustrations and demonstrations that are included.

Prerequisites
The majority of the course material is presented through qualitative descriptions, practical examples, illustrations and demonstrations, which require only basic mathematical skills. However, some familiarity with time and frequency domain measurements, linear algebra and statistics will enhance overall understanding of the material.

Topical Outline
• Properties of the FFT
• Sampling and digitizing
• Aliasing and filters
• Leakage and windows
• Averaging techniques
• Autopower, crosspower and coherence
• Transmissibility and isolation
• Measuring and interpreting the transfer function
• Rotating Machinery Basics
• What is an order?
• Rotation synchronous data acquisition methods
• AM and FM modulation effects
• FIR, IIR and re-sampling filters
• Up-sampling down-sampling and adaptive re-sampling
• Time Frequency Methods
• Short time Fourier transform
• Gabor expansion and Gabor transform
• Orthogonality, invertibility and the dual function relationship
• Gabor order tracking
• Introduction to wavelets
• Fundamentals of Multi-Input-Multi-Output (MIMO) System Analysis
• Review of Single-Input-Single-Output (SISO) systems
• Introduction to Single-Input-Multiple-Output (SIMO) systems
• Partial correlation concepts
• Coherent output power
• Statistical errors in basic estimates
• Conditioned spectral analysis
• Forces and Sources in MIMO Systems
• Least squares solution techniques
• Force estimation technique Conditioned Source Analysis (CSA)
• Case history: transfer path analysis
• Case history: model correlation and updating
• Introduction to Data Classification and Pattern Recognition
• Techniques for building and analyzing feature vectors
• Recognition engines: neural networks and hidden Markov models
• Applications: machine noise recognition, vision based gear mesh quality

Instructor: Michael F. Albright
Fee $1225 1.3 CEUs

Practical Race Car Data Acquisition: RPM and Speed Analysis Fast Track
I.D.#PD230834ON (Online delivery)

Two of the most important and commonly used components in racing data acquisition today are engine RPM and speed analysis. These two channels of data give race teams and engineers critical information that can be used every day to help quantify changes in both the driver and the race vehicle. This 80-minute, online short course focuses on race car data acquisition, highlighting cornering speeds, engine acceleration rates, gear selection, engine RPM curves, shift times, throttle on/off, engine acceleration, wheel spin, brake lock, cornering speed, ignition cutout and much more. Whether you are a weekend racer or a professional data acquisition engineer, you will find the components of this course fundamental to successful data analysis in the real world. From hardware installation to software interpretation, this course will give you confidence and additional insight into these key pieces of data analysis.

Major topics include:
• Introduction
Is this Fast Track for you?
The Practical Race Car Data Acquisition: RPM and Speed Analysis Fast Track is designed for the racer - from the professional road racer to the weekend racer - or the engineer who is incorporating data acquisition into their race team strategy and want to maximize the abilities of their system as quickly as possible. This course does not require any pre-requisite, as the content will unfold from the basics, up to the more advanced features of these important data acquisition sensors. The knowledge gained in this course can be applied the next day at any level of racing without any additional training or experience.

What You Will Receive
- Three months of online access to the 80 minute presentation
- Integrated knowledge checks to reinforce key concepts
- Proof of Participation

Instructor: Dave Scaler
Fee $149

Journals
The Journal Set included these seven titles:
- SAE International Journal of Aerospace
- SAE International Journal of Commercial Vehicles
- SAE International Journal of Engines
- SAE International Journal of Fuels and Lubricants
- SAE International Journal of Materials and Manufacturing
- SAE International Journal of Passenger Cars – Mechanical Systems
- SAE International Journal of Passenger Cars – Electronic and Electrical Systems

sae.org/journals
Advanced Vehicle Dynamics for Passenger Cars and Light Trucks

3 Days
I.D.# C0415

This interactive seminar will take you beyond the basics of passenger car and light truck vehicle dynamics by applying advanced theory, physical tests and CAE to the assessment of ride, braking, steering and handling performance. Governing state-space equations with transfer functions for primary ride and open loop handling will be developed & analyzed. Building on the analysis of the state space equations, common physical tests and their corresponding CAE solutions for steady state and transient vehicle events will be presented. The “state-of-the-art” of vehicle dynamics CAE will be discussed. Common lab and vehicle tests and corresponding metrics used to assess chassis system and vehicle performance will be discussed in great detail. Hands-on workshops using CARSIM™ vehicle dynamics simulation software will help reinforce the material. Significant time will also be dedicated to the use of design of experiments (DOE) as a tool to assist in the analysis and optimization of chassis systems for multiple vehicle responses.

Participants should bring a scientific calculator to participate in the classroom workshops.

Learning Objectives
By attending this seminar, you will be able to:
• Apply vehicle dynamics theory to practical evaluation and measurement
• Use governing state space equations and transfer functions to determine the effect of key parameters on primary ride and open loop handling
• Describe the current “state-of-the-art” of vehicle dynamics CAE
• Articulate various types of vehicle dynamics models
• Recognize kinematics and compliance (K&C) lab tests commonly used to quantify chassis system performance
• Identify and evaluate important K&C metrics used in vehicle dynamics development
• Identify and utilize important vehicle tests commonly used in industry to evaluate ride, steering and handling performance
• Relate chassis system characteristics to vehicle dynamic performance
• Utilize vehicle dynamics CAE software for the simulation of common physical lab and vehicle tests
• Apply design-of-experiments (DOE) to vehicle dynamics development

Who Should Attend
This seminar is designed for automotive engineers in the vehicle dynamics, chassis, suspension, steering and braking fields who work in product design, development, testing, simulation or research.

Prerequisites
Participants must have a working knowledge of the fundamentals of vehicle dynamics acquired through sufficient work experience or by participating in seminars such as SAE’s Vehicle Dynamics for Passenger Cars and Light Trucks (ID# 99020) or Concurrent Engineering Practices Applied to the Design of Chassis Systems (ID# 96016).

Topical Outline
DAY ONE
• Modeling Primary Ride Dynamics
• 4-degree of freedom (DOF) primary ride model
• 2-DOF primary ride model
• Modeling Vehicle Handling Dynamics
• Developing the cornering compliance model
• Developing the transfer function
• Introduction to Vehicle Dynamics CAE
• Types of models
• Strengths/Limitations
• Commercial software packages
• Measurement and Simulation of Suspension Kinematics and Compliance (K&C)
• Objectives of the K&C test
• Definitions
• Measurement equipment
• Common tests
• Simulation of the K&C test
• Measurement and Simulation of Primary Ride
• Primary vs. Secondary Ride
• Physical measurements
• Common primary ride metrics
• Olley Criteria for primary ride
• Primary ride simulation
• CARSIM™ Exercise - Primary Ride Simulation

DAY TWO
• Measurement and Simulation of Acceleration and Braking
• Steady state acceleration test and metrics
• Steady state braking test and metrics
• Simulation of steady state acceleration and braking
• Measurement and Simulation of Steering
• On-center steering test and metrics
• Low-g swept steer test and metrics
• Simulation of steering tests
• CARSIM™ Exercise - Steering
• Measurement and Simulation of Open Loop Handling
• Definition of open loop
• Steady state open loop tests -- High-g swept steer
• Transient open loop tests -- Step steer; Brake/throttle release in a turn; Fishhook; Sine with dwell
• Simulation of open loop handling tests
• CARSIM™ Exercise - Open Loop Handling

DAY THREE
• Measurement and Simulation of Closed Loop Handling
• Definition of closed loop
• Steady state closed loop tests -- Constant radius
• Transient closed loop tests -- Lane change; Slalom
• Simulation of closed loop handling tests
• CARSIM™ Exercise - Closed Loop Handling
• Design of Experiments (DOE) Applied to Vehicle Dynamics
Vehicle Dynamics & Handling

Instructor-led programs
Online courses
ACTAR approved
Part of a Certificate
Program Curriculum

Applied Vehicle Dynamics

3 Days I.D.# C0414

While a variety of new engineering tools are becoming available to assist in creating optimal vehicle designs, subjective evaluation of vehicle behavior is still a vital tool to ensure desired braking, handling, and other dynamic response characteristics. In order to better prepare today’s engineer for this task, this course offers twelve modules devoted to the key 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 principles in the real world.

Note that unlike most driving schools, this course is not designed to train performance drivers. Rather, the exercises on days one and two build the bridge between vehicle dynamics theory and practical application by providing a rich academic underpinning and then reinforcing it with highly focused and relevant driving experiences. Significant technical skill-building is provided on day three, with increased instructor supervised track time to further absorb the principles learned on days one and two. If your job description does require performance driving skills, the dynamic exercises on day three will lay a solid foundation on which you can independently refine your own skills.

This course is offered at the BMW Performance Center in Greer, South Carolina (near Greenville). Driving exercises are conducted on a closed circuit and skidpad using primarily BMW 3-series sedans and other BMW vehicles for comparison exercises. Vehicles are also equipped with Escort G-Timer devices for basic data acquisition.

Learning Objectives
By attending this seminar, you will be able to:
- Explain tire-road friction limits and compose the friction circle for a given vehicle system
- Compute fundamental braking response attributes
- Illustrate the physics of turning and calculate lateral weight transfer
- Estimate brake system balance and brake proportioning
- Measure and graph a vehicle’s understeer gradient
- Analyze basic anti-lock brake system (ABS) operation
- Discuss the effectiveness and limitations of electronic stability control (ESC) systems
- Demonstrate the interactions of brake, steering, suspension, and powertrain systems
- Calculate the most efficient path for a vehicle to negotiate a given test maneuver
- Comprehend the subtle effects that vehicle positioning has on vehicle speed
- Predict what response characteristics can be influenced by vehicle state
- Define those vehicle dynamic attributes which can be impacted through vehicle selection

Who Should Attend
This course has been developed for engineers and technical personnel involved in all fields related to the design or development of vehicle dynamics, vehicle braking systems, powertrain systems, chassis systems, or suspension systems. In addition, this course can be valuable to those with component design responsibilities in brake, chassis, suspension, or tire disciplines who desire a fundamental background in vehicle dynamics with a practical driving linkage.

Prerequisites
You should have an undergraduate engineering degree or a strong technical background. As a minimum, a basic knowledge of college algebra, college physics, and a familiarity with vehicle brake and suspension systems is required.

Topical Outline
DAY ONE
- Longitudinal Slip and Weight Transfer
  - Defining longitudinal slip
  - Longitudinal mu-slip relationship
  - Principles of longitudinal weight transfer
  - Friction circle concept
  - Driving exercise - orientation
- Fundamentals of Straight-Line Braking
  - What do braking systems do?
  - How do those components contribute?
  - What are the underlying fundamental relationships?
- Driving exercise - limit braking
  - Slip Angle and Transient Response
    - Slip angle and cornering stiffness
    - High-speed steering and transient response
    - Lateral weight transfer
    - Driving exercise - slalom
- Braking Stability
  - Rear brake proportioning fundamentals
  - Braking stability
  - Rear brake proportioning in practice
  - Driving exercise - brake in a turn

DAY TWO
- Steady-State Cornering
  - The understeer gradient
  - Components of the USG
  - Neutral steer, understeer, and oversteer
  - Driving exercise - skidpad
- Combining Lateral and Longitudinal Slip
  - Braking in a turn, turning while braking
  - Drive-off in a turn, turning during drive-off
  - Driving exercise - avoidance
- Anti-Lock Brake Systems
  - Stability, steerability, and stopping distance
  - Objectives and strategies of ABS
  - ABS performance
  - Driving exercise - avoidance
- Electronic Stability Control
  - Objectives and limitations of ESC
  - ESC detection and countermeasures
  - ESC performance
  - Driving exercise - wet skidpad

Catalog Key

- ACTAR
- 18 ACTAR CEUs
- Fee $1595
- 2.0 CEUs
- Richard Lundstrom and Timothy Drotar
Vehicle Dynamics for Passenger Cars and Light Trucks e-Seminar

I.D.#PD130702ON (Online delivery)

Convenient, portable, and with core content from the instructor-led seminar (content and description immediately preceding), this four and a half hour e-seminar option offers an alternative way to receive the same instruction without the expense of travel and time away from the workplace. This course offers more than fourteen hours of instruction and simulations divided into nineteen video modules; The Automotive Chassis: Engineering Principles by Reimpell, Stoll and Betzler; a coordinated handbook that includes a resource guide and SAE papers and paper collections.

View the complete program brochure and demo at http://www.sae.org/e-seminars/vehicledynamics.

What You Will Receive:
- 365 Day access through MyLearn.sae.org
- Links to streaming video modules
- Course Handbook (downloadable .pdf’s, subject to DRM)
- The Bosch Automotive Handbook (hardback)
- The book, The Automotive Chassis: Engineering Principles by Reimpell, Stoll and Betzler (hardback)
- The SAE Papers (bound, paperback):
  - 970091
  - SP-355
  - 760713
  - 760710
- Online Pre-test (self-test, immediate results)
- Online Post-test (submit to SAE)
- CEUs/Certificate of Achievement (with satisfactory post-test score)

Instructor: Richard Lundstrom
Fee $695

24 ACTAR CEUs

Fundamentals of Heavy Truck Dynamics

3 Days
I.D.# C0837

Understanding vehicle dynamics is one of the critical issues in the design of all vehicles, including heavy trucks. This seminar provides a comprehensive introduction to the fundamentals of heavy truck dynamics. It covers all of the critical subsystems that must be considered by designers and decision makers in determining the effect of various components on heavy truck dynamics. This seminar begins where the tires meet the ground, progressing up through the various components and bringing together the theory and practice of heavy truck dynamics. A series of case studies related to truck ride engineering will provide an opportunity for attendees to demonstrate their knowledge gained and introduces them to some of the newer technologies related to evaluating and improving heavy truck ride dynamics.

Learning Objectives

By attending this seminar, you will be able to:
- Acquire an overall understanding of heavy truck dynamics, both its theory and practice
- Acquire and demonstrate knowledge of heavy truck ride engineering and the factors that affect it
- Define the dynamics of various truck sub-systems and components that include tires, steering system, and truck suspensions
- Identify how sub-systems or components interact with other sub-systems to effect truck dynamics
- Describe some of the contemporary issues in heavy truck dynamics
- Assess and evaluate selected research topics you may want to consider for the sub-systems and components that you work with

Who Should Attend

This seminar will benefit design, manufacturing, and customer support engineers in the heavy truck industry, most notably the original equipment manufacturers and their suppliers. Managers and marketing staff, as well as individuals in government agencies and educators in academic institutions that have a need for understanding heavy truck dynamics will also benefit from attending this seminar.

Prerequisites

A basic knowledge of college-level statics, dynamics, and vibrations will help the attendees to more easily follow the course material. Practical knowledge and common sense can replace the academic training in statics and dynamics.

Topical Outline

DAY ONE
- Course Introduction
- What is Vehicle Dynamics
- Course Outline
- Tire Dynamics
- Tire Mechanics
- Tire Operating Conditions
- Steering System
- Steering Mechanism
- Forces and Moments
- Steering Vibrations
- Steering Effects
- Maneuverability

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**Vehicle Dynamics & Handling**

**3 Days**

**I.D.# 99020**

This seminar will present an introduction to Vehicle Dynamics from a vehicle system perspective. The theory and applications are associated with the interaction and performance balance between the powertrain, brakes, steering, suspensions and wheel and tire vehicle subsystems. The role that vehicle dynamics can and should play in effective automotive chassis development and the information and technology flow from vehicle system to subsystem to piece-part is integrated into the presentation. Governing equations of motion are developed and solved for both steady and transient conditions. Manual and computer techniques for analysis and evaluation are presented. Vehicle system dynamic performance in the areas of drive-off, braking, directional control and rollover is emphasized. The dynamics of the powertrain, brakes, steering, suspension and wheel and tire subsystems and their interactions are examined along with the important role of structure and structural parameters related to vehicle dynamics. Physical experiments, applicable to vehicle dynamics are also introduced.

Attendees will receive the Bosch Automotive Handbook and The Automotive Chassis: Engineering Principles by Reimpell, Stoll and Betzler.

**Learning Objectives**

By attending this seminar, you will be able to:

- Summarize how vehicle dynamics is related to the voice of the customer
- Identify important vehicle system parameters useful for effective application of vehicle dynamics to chassis design
- List and explain parameters that affect vehicle performance relative to drive-off, braking, directional control and rollover
- Identify physical measurements needed to effectively apply vehicle dynamics to passenger cars and light trucks
- Define the value of vehicle dynamics simulation in the development and evaluation of vehicles
- Explain the balance required between ride, directional control and rollover and the essential process for this balance to be obtained for marketplace vehicles

**Who Should Attend**

Automotive engineers and quality professionals who work in product design, testing, quality, process or development will benefit from attending.

**Prerequisites**

Participants should have an undergraduate engineering degree and some exposure to vehicle dynamics.

**Topical Outline**

**DAY ONE**

- The Role of Vehicle Dynamics in Passenger Car and Light Truck Product Development
- Vehicle Dynamics and the Voice of the Customer
- Use of QFD to manage vehicle dynamics performance in drive-off, braking, ride and handling
- Thinking systematically about automotive chassis design and development through the logic of vehicle dynamics
- Effective Metrics for Vehicle Dynamics
- Vehicle system, subsystem and piece-part metrics used to link vehicle dynamics to vehicle system design and development: bounce frequencies, lateral acceleration gain, understeer gradient, roll gradient, roll stiffness, etc.
- Elementary Tire Patch Forces and Moments: Forces and Moments at the Tire Contact Patch During Steady Braking, Steady Cornering and Steady Drive-Off Maneuvers
- Acceleration (Drive-Off) Performance
- Basic powertrain system anatomy and architecture
- Power limited and traction limited drive-off including powertrain system dynamics required to produce vehicle motive force at the tire patch
- Road load considerations: aerodynamic resistance, rolling resistance, grade resistance
- Performance prediction in acceleration and fuel economy

**DAY TWO**

- Braking Performance
- Basic brake system anatomy and architecture

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<td>Center of Gravity (CG) Calculations</td>
<td>Vehicle Dynamic Elements</td>
<td>Human Body Response to Vehicle Vibrations</td>
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<td>Roll Dynamics</td>
<td>Suspension Dynamics</td>
<td>Case Studies: Contemporary Topics in Heavy Truck Dynamics</td>
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<td>Load Transfer</td>
<td>Nonlinearities in Suspension</td>
<td>CASE 1: Practical Evaluation of Truck Suspension Kinematics and Dynamics</td>
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<td>Aerodynamics Loads</td>
<td>Resonance of Axle Hop</td>
<td>CASE 2: Dynamic Influence of Frame Stiffness on Heavy Truck Ride</td>
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<td>Frame Dynamics</td>
<td>Bounce and Pitch of Rigid Body</td>
<td>CASE 3: Effect of Panhard Rod Cab Suspensions on Heavy Truck Ride Measurements</td>
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<td>Roll Response</td>
<td>CASE 4: Simulation Analysis of Suspension and Driveline Dynamics Coupling and their effect on Truck Ride</td>
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<td>Frame Bending</td>
<td>Seminar Evaluation and Conclusion</td>
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<td>Cab Mounting System</td>
<td><strong>Instructor:</strong> Mehdi Ahmadian</td>
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<td>Position of Fifth Wheel</td>
<td>Fee $1545</td>
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<td></td>
<td>Driver’s Seat</td>
<td>2.0 CEUs</td>
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<td>Loading</td>
<td>15 ACTAR CEUs</td>
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<td>Trailer Effects</td>
<td><strong>Instructor-led</strong></td>
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<td>Perception of Ride</td>
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<td>Human Body Response to Vehicle Vibrations</td>
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<td>Case Studies: Contemporary Topics in Heavy Truck Dynamics</td>
<td><strong>Program Curriculum</strong></td>
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</table>

**Instructor:** Mehdi Ahmadian

Fee $1545

2.0 CEUs

15 ACTAR CEUs
DAY THREE

• Cornering Fundamentals
  • Low speed turning
  • High speed cornering: tire forces, Bundorf bicycle model, understeer gradient, characteristic speed, lateral acceleration gain, yaw velocity gain, side-slip
  • Suspension effects on cornering: tire cornering stiffness, camber thrust, roll steer, lateral force compliance steer, aligning torque, lateral load transfer, steering system
  • Experimental methods for vehicle handling development

• Suspension Systems
  • Suspension system anatomy and suspension system performance requirements relative to drive-off, braking, ride and handling
  • Solid live axles, twist beam suspensions and independent suspensions
  • Side view pitch poles and pitch axis considerations: anti-squat and anti-dive suspension geometry, wheel travel and caster geometry
  • Role axis considerations: roll center location, roll axis geometry and location, wheel travel and toe geometry, wheel travel and camber geometry

• Steering Systems
  • Steering system anatomy, architecture and performance requirements
  • Steering geometry, wheel geometry, steering system forces and moments, steering ratio, steering compliance
  • Experimental methods for steering system performance evaluation and development

• Roll-Over Fundamentals
  • Vehicle system roll-over prevention requirements
  • Elementary and suspended vehicle simulations
  • Suspension system and steering system considerations

• Introduction to CAE Applications for Vehicle Dynamics: CARSIM™ and sSNAP and Manual Analysis Methods.

Instructor: Richard Lundstrom
Fee $1665       2.0 CEUs

Chassis & Suspension Component Design for Passenger Cars & Light Trucks

3 Days
I.D. # 95025

Just as the chassis and suspension system provides an ideal framework for the automobile, this popular SAE seminar provides an informative framework for those involved in the design of these important systems. Emphasizing the fundamental principles that underlie rational development and design of suspension components and structures, this course covers the concepts, theories, designs and applications of automotive suspension systems.

Learning Objectives

By attending this seminar, you will be able to:

• Identify the types of suspensions and structures and their design differences from concept to prototype, theory to application; static and dynamic load conditions; and suspension modeling
• Describe the chassis design process and various suspension system interactions through demonstrations, video and audio devices and computer simulation
• Illustrate how an algorithm for a complete design cycle of the chassis works
• Explain the various chassis suspension analyses and designs that need to be performed and verified during development
• Recognize Magic Numbers in suspension design and the Suspension Design Factors (SDF)
• Analyze, predict, and evaluate the design parameters and performance characteristics for ride and handling quality control behavior of ground motor vehicles as a result of suspension design
• Reference a unique set of lecture notes related to suspension design

Who Should Attend

This seminar is designed primarily for engineers involved in vehicle ride, handling, chassis design, suspension, steering and brake design for passenger cars and light trucks.

Topical Outline

DAY ONE

• Survey
• General Overview
• Tires and Wheels
• Ride and Ride Design Criteria
• Handling and Handling Design Criteria
• Vehicle Dynamics Terminology

DAY TWO

• Roll Rates, Roll Motion
• Dynamic Transfer During Cornering
• Understeer Coefficient
• The Design of Springs, Stabilizer Bars, Shock Absorbers, Bushings, Control Arms
• Links, Semi-Active Damper, and Control Links
• Static Analysis and Design of Suspensions
• Suspension Terminology

DAY THREE

• Fore/At Dynamic Load Transfer Analysis
• Dive, Lift and Squat
• Steering Systems
• Active and Semi-Active Suspension
• CAD/Static, Dynamic and Proving Ground Testing
• Suspension Design Cycle
• Magic Number in Suspension Design
• Concluding Remarks

Instructor: Pinhas Barak
Fee $1545       2.0 CEUs

3 ways to get a no-obligation price quote to bring a course to your company • Call SAE Corporate Learning at 1-724-772-8529 • Fill out the online quote request at www.sae.org/corplearning • Email us at Corplearn@sae.org
Mehdi Ahmadian
Mehdi Ahmadian, Ph.D. is a Professor of Mechanical Engineering at Virginia Tech, where he is also the Director of the Center for Vehicle Systems and Safety (CVeSS) and the Railway Technologies Laboratory (RTL). He is the founding director of CVeSS, RTL, Virginia Institute for Performance Engineering and Research, and the Advanced Vehicle Dynamics Laboratory. Dr. Ahmadian has authored more than 200 technical publications and has made more than 130 technical presentations in topics related to advanced technologies for ground vehicles. He holds six U.S. patents and has edited four technical volumes. He currently serves as editor for the International Journal of Vehicle Systems Dynamics, co-editor for Advances in Mechanical Engineering, and associate editor for the journal Shock Vibration. Dr. Ahmadian is a member of SAE and is the recipient of the 2008 Forest R. McFarland Award for outstanding contributions to the SAE Engineering Meetings Board. He is also a Fellow of ASME and a Senior Member of AIAA.

In the past, he has served as associate editor for the ASME Journal of Vibration and Acoustics and associate editor for the AIAA Journal. Dr. Ahmadian’s research interests include vehicle dynamics and control, advanced suspensions, biodynamics, ride engineering, tire dynamics, advanced materials for improving vehicle performance, and vehicle noise and vibration assessment. Dr. Ahmadian has over 25 years of industrial and academic experience, working in research, development, and engineering of various systems for ground vehicles, air vehicles, and water vessels for both civilian and military applications.

Michael F. Albright
Michael F. Albright is co-founder and General Manager of SignalX Technologies, LLC, a firm specializing in NVH engineering and custom test and measurement application development. He brings over 20 years of NVH experience to the SAE Noise Academies team. His past positions include Business Development Manager for the NVH consulting group of LMS North America, Management and Project engineering positions at the Roush Anatrol Division of Roush Industries, Inc. and Civilian engineering for the U.S. Navy. With experience predominantly in the automotive industry, Mr. Albright has addressed a very diverse range of noise and vibration control issues including Powertrain NVH, Vehicle NVH, Brake noise, Engine accessory noise, Driveline NVH, Test procedure and facility development, Test/CASE Hybrid simulation methods, as well as a host of manufacturing quality issues. Mr. Albright’s degrees include a BSME from University of Cincinnati and MSME from Purdue University.

Farid M.L. Amirouche
Farid M.L. Amirouche has been with the Univ. of Illinois at Chicago for over 13 years where he serves as Professor in Mechanical and Bioengineering and the Director of the Dynamics and Vibration Laboratory and the Biomechanics Research Laboratory. In addition, he has contributed over 100 publications in the area of dynamics, vibration, and control of mechanical systems and human body modeling. Dr. Amirouche’s primary interest is in the dynamics and vibration of multibody systems with emphasis on vehicles and their interaction with the human operator, as well as modeling techniques in human body vibration. His focus has been in the development of new technologies, combing neural networks, continuum mechanics, and vibration to advance the state of the art of the dynamic analysis and simulation of interconnected rigid and flexible multi-body systems. Dr. Amirouche is the recipient of the SAE Ralph R. Teetor Educational Award (1994), the 1995 NATO project on human body vibration control, and the G-7 Summit Fellowship among others. He has also published two textbooks in the field of computer aided design and multi-body dynamic analysis.

Michael A. Anleitner
Michael A. Anleitner is President of Livonia Technical Services Company, a consulting and training firm that provides technical and managerial expertise to companies engaged in manufacturing and assembly of commercial, industrial, and consumer products. His activities at LTS include quality and productivity improvement, product development, process improvement, total quality system implementation, and technical engineering support. Mr. Anleitner has over 30 years of diversified experience in manufacturing and engineering. He was co-founder, and for seven years, CEO of HydraMechanica Corporation, which produced brakes, clutches, torque-limiting devices, friction materials, and other special friction products for a variety of applications. Prior to that, he was the Director of Engineering for a Tier I automotive supplier. His experience includes positions at Ford Motor Company in both materials and design engineering.

Mr. Anleitner has co-authored several papers published by the American Society for Quality and regularly speaks at Automotive Division meetings of ASQ. He is also a contributor to the SAE International Technical Paper Series, has had three papers selected for SAE’s Transactions, and has been honored with SAE’s Award for Excellence in Oral Presentation. Mr. Anleitner received a B.A. in technical communications from Michigan Technological University, a B.S. in engineering from Wayne State University, and an M.B.A. from the University of Michigan.

Jamil Baghdachi
Dr. Baghdachi serves as the President of Innovative Technical Systems Corporation and is a Professor/Program Director at Eastern Michigan University, Coatings Research Institute. He has been actively involved in adhesive bonding and coatings technologies, their applications and the science of adhesion for the past 25 years. An active consultant for the industry, he has been conducting workshops on adhesive bonding, coatings and paint, corrosion, and plastics for the past 20 years. He is the author of two technical books, has published 152 technical papers and holds 41 patents in the above areas. He is a frequent speaker for professional organizations including SAE, ASM, SME and ESD. Prior to his current positions, Dr. Baghdachi was on the technical staff of BASF Corporation and ARCO Chemicals. He received his B.S. and M.S. in Chemistry from the University of Tennessee and a Ph.D. in Chemistry from the University of Mississippi and worked as a post-doctoral fellow at the University of Massachusetts.

Pinhas Barak
A professor of mechanical engineering, Dr. Pinhas Barak specializes in vehicle systems dynamics and suspension design, active and semi-active suspension systems, chassis and vehicle design systems, mechanical control systems, and vibrations. He recently established the Vehicular Dynamics Design Center at Kettering University. Dr. Barak is a member of SAE, ASME, ASEE and SIAM, with more than 25 years of industrial experience in automotive engineering. He also received the SAE Outstanding Faculty Advisor Award in 1993. Dr. Barak received both a B.S.C. and an M.S.C. in chemical engineering from the Technion Israel Institute of Technology and his Ph.D. in mechanical engineering from Wayne State University.

Ewa Bardasz
Dr. Ewa Bardasz is a Fellow at The Lubrizol Corporation, where she is currently responsible for overseeing activities related to lubricating novel combustion hardware, aftertreatment systems and emissions. She is experienced in the areas of lubrication, corrosion inhibition, engine testing and exhaust emission control. Before joining Lubrizol, Dr. Bardasz worked for Exxon Research & Engineering, where she was a member of the team responsible for formulating new generations of fuel efficient passenger car crankcase lubricants. She holds 21 U.S. patents in lubrication, corrosion inhibition, and emission control. Dr. Bardasz has published multiple technical and scientific papers and is a frequent invited speaker at conferences throughout the U.S. and
Europe. She is the recipient of the Society of Automotive Engineers 2002 Award for Research on Automotive Lubricants. Dr. Bardasz obtained a M.Sc. in Chemical Engineering from Warsaw Technical University and a Ph.D. in Chemical Engineering from Case Institute of Technology. She is a member of SAE International, Society of Tribologists and Lubricating Engineers, American Chemical Society, and New York State Academy of Science.

**Simon J. Baseley**

Simon J. Baseley is the Director of Engineering Strategy and Program Management within the Intelligent Hydraulic Drive Group at Bosch Rexroth Corporation. Mr. Baseley was also the Director of the Intelligent Hydraulic Drive Products for the Dana Corporation, where he worked to develop and promote applications for hydraulic drive systems for vehicles. Prior to that, he was the Director of Advanced Engineering for Hobourn Automotive Ltd. where he formulated and executed new hydraulic pump applications and directed the applied research initiatives in fluid flow and noise suppression. Mr. Baseley also has extensive experience within the aerospace industry, previously serving as Chief Design Engineer for Rolls-Royce Ltd. An active member of SAE, Mr. Baseley has written several papers on noise related research and hydraulic hybrid systems. He holds six patents related to hydraulic pumps and hybrid systems. Mr. Baseley, formally educated in the U.K., received a B.S. in Mechanical Engineering from the University of Nottingham and a M.S. in Aircraft Propulsion from Cranfield University.

**Daniel P. Bauer, Jr.**

Mr. Bauer, an ASME Certified Senior GD&T Professional who holds a Master of Science in Industrial Operations and is fluent in Spanish, serves as president and principal consultant with ITR. With experience supporting over 20 automotive component and vehicle programs in the past 10 years in the U.S., Europe, and China, he specializes in providing training and engineering services in the areas of design engineering, quality, performance improvement, and productivity. In the early ’90s Mr. Bauer spent three years designing and implementing training and quality programs for six Ford Motor Company launches. Programs included electrical, fuel handling, and powertrain components, including the 60V6 Vortec Launch. Over the past three years he has worked to develop a comprehensive error proofing system for Chrysler Corp. He has worked with Chrysler to implement the system on several vehicle programs: the 1998 Dodge Durango, the 1999 Jeep Grand Cherokee, the 2000 Dakota Quad Cab, the 2001 Minivan, and the 2002 Ram Pickup. Most recently Mr. Bauer served as a visiting professor at Shanghai Jiao Tong University where he conducted a certification program in Geometric Dimensioning and Tolerancing and Reading Engineering Drawings. The train-the-trainer program certified university professors and GM engineers who support the GM China training curriculum in both Shanghai and Beijing. He serves as an adjunct instructor and consultant for the Society of Manufacturing Engineers, DaimlerChrysler Quality Institute, General Motors Univ., General Physics Training Institute, and other post secondary institutions. He provides training and consulting services on topics including Failure Mode and Effects Analysis (FMEA), Control Plan Development, Problem Solving, Statistical Process Control (SPC), Capability Analysis, Blueprint Reading, Geometric Dimensioning and Tolerancing (GD&T), Project Management, and Error Proofing.

Mr. Bauer has authored publications on Geometric Dimensioning and Tolerancing, Tolerance Stackup Analysis, Product Design Error Proofing, Failure Mode and Effects Analysis, Lean Plant Layout, Standardized Work, Blueprint Reading, Program Management, Advance Product Quality Planning, Control Plan Development, and Team Building. He has additionally worked with General Motors Distance Learning to pilot a series of interactive television broadcasts on Project Management. Mr. Bauer holds a B.A. from Eastern Michigan Univ. and an M.S. in Industrial Operations with distinction from Lawrence Technological Univ.

**John-Paul Belanger**

John-Paul Belanger is president of Geometric Learning Systems, a consulting firm specializing in geometric dimensioning and tolerancing (G D & T). For over ten years, he has trained people throughout North America and Europe in the proper interpretation and application of G D & T per the Y14.5 standard by using practical examples. Mr. Belanger is certified by the American Society of Mechanical Engineers as a Senior G D & T Professional, and has worked with a wide range of companies in the automotive, aerospace, electronic, and other industries to apply tolerances and perform stack calculations. He holds a B.S. in Aerospace Engineering from the University of Michigan specializing in aircraft design and safety.

**Mark Beranek**

Mark Beranek has 20 years combined experience at Boeing and Naval Air Systems Command (NAVAIR) working in the aerospace fiber optics and photonics research and engineering field. His program experiences span commercial aircraft, military aircraft, and space vehicle fiber optics development and acquisition, and government and corporate-sponsored fiber optics and photonics science and technology programs. Mr. Beranek’s early aerospace career focused on development of optoelectronic device and package design and assembly technology for digital fiber optic transceiver applications including the Boeing 777, NASA Earth Observer One, and Boeing X-32 Joint Strike Fighter. More recently, Mr. Beranek has been working on military aircraft fiber optics acquisition and science & technology programs in the areas of advanced component design, qualification, standardization, supportability, maintainability and manufacturing technology development. Mr. Beranek has held fiber optics committee chairmanship positions for the IEEE Components, Packaging and Manufacturing Technology Society, IEEE Lasers and Electro-Optics Society and IEEE Photonics Society, and the SAE Avionics Systems Division. Mr. Beranek holds a B.S. in Technology and Management from the University of Maryland, University College, a B.S. in Chemistry from Northern Illinois University, and an A.S. Certificate in Electronics from Harper College.

**Paul Berry**

Paul Berry is currently the Powertrain Core Competency Project Manager at Ford Motor Company. During his tenure with Ford, Mr. Berry has been a Powertrain Systems Engineering Technical Specialist responsible for defining processes, methods, tools and training for implementing the systems engineering approach within the powertrain community. He implemented a common set of vehicle attributes, attribute cascade diagrams, trade-off studies, and interface diagrams. Mr. Berry authored the Ford Product Development System (FPDS) Targets Balancing and Cascading course, which was delivered both in North America and Europe. He is a co-author of the Ford Systems Engineering Fundamentals course, and has received two Quality Awards.

Mr. Berry has also led systems engineering projects for aerospace, highway, rail and water-borne vehicles, as well as for consumer electronic systems. He is a Certified Six Sigma Black Belt and teaches systems engineering subjects as well as both executive and technical-level Design for Six Sigma classes. Mr. Berry has taught courses at Boston University, Rensselaer Polytechnic Institute and has lectured at the University of Detroit-Mercy and the Massachusetts Institute of Technology. A member of SAE and INCOSE, Mr. Berry holds a B.S. and M.S. in Aeronautical Engineering from Rensselaer Polytechnic Institute.

**Larry Bissell**

Larry Bissell is a renowned and well respected international trainer, consultant, and auditor specializing in automotive supply chain management, supplier development, business management systems, business excellence, and continual improvement for all size automotive companies. Mr. Bissell is recognized as an authority on global supply chain requirements and global supplier
development, particularly regarding the stringent requirements of automotive OEM’s within the United States. His expertise, abilities, and techniques are designed and structured for automotive supplier organizations that wish to participate in the automotive global supply chain market. Mr. Bissell has over 30 years of industrial experience and has been directly involved in over 1000 highly successful management system audits and client consultations within the ISO 9001, QS-9000, and ISO/TS 16949:2002 arenas.

André Boehman
André Boehman is a Professor of Fuel Science and Materials Science and Engineering in the Department of Energy & Geo-Environmental Engineering in the College of Earth and Mineral Sciences at the Pennsylvania State University, where he has taught courses on Energy, Fuels, Combustion and the Environment since 1994. At the Penn State Energy Institute, Prof. Boehman manages the Diesel Combustion and Emissions Laboratory. Professor Boehman’s research interests are in alternative and reformulated fuels, combustion and pollution control. His present research activities are focused on alternative diesel fuels, diesel combustion and diesel exhaust aftertreatment. He is presently on the Editorial Board of Fuel Processing Technology and holds executive positions with the American Chemical Society Division of Fuel Chemistry and with the International DME Association. He has received the 1999 Alumni Achievement Award from the University of Dayton School of Engineering, the 1999 Matthew and Anne Wilson Award for Outstanding Teaching from thePenn State College of Earth and Mineral Sciences and the Philip L. Walker Jr. Faculty Fellowship in Materials Science and Engineering, from 1995-97. He also received the 1986 Charles T. Main Bronze Medal from the American Society of Mechanical Engineers. He has supervised seventeen M.S. theses and five doctoral theses at Penn State, and he has published more than 36 refereed papers and book chapters. He holds a B.S. in Mechanical Engineering from the University of Dayton (1986) and an M.S. (1987) and Ph.D. (1993) in Mechanical Engineering from Stanford University. He held a two-year postdoctoral fellowship in the Molecular Physics Laboratory at SRI International, Menlo Park, California.

Dennis Bogden
Mr. Bogden is currently owner and chief engineer of Robotronics SP, a consulting firm specializing in the design of custom embedded solution products. He previously worked on embedded electronic control design as both a “hands on” engineer and executive leader at General Motors. Mr. Bogden is an expert in engine and transmission embedded control along with microcontroller hardware and software design and mechatronics/system architecture design. He currently writes embedded design articles for Servo and other magazines. He has provided embedded system consulting with Delphi Automotive, Infineon Semiconductor, General Motors and small businesses. Mr. Bogden has many SAE awards relating to Optimizing Powertrain Control activities. He has a B.S. in Electrical Engineering from Lawrence Technological University and Master in Business Management from Central Michigan University.

Theodore Bohn
Theodore Bohn is the principal investigator of plug-in hybrid electric vehicle (PHEV) prototype vehicle development in the Vehicle Systems Group at the Center for Transportation Research at Argonne National Laboratory. The primary focus of his efforts includes in-vehicle traction battery subsystem benchmarking and validation, as well as power electronics and embedded systems control optimization of the electric powertrain in PHEVs. Recent research includes energy storage system cost, safety, performance and reliability studies, performed as part of the Battery Hardware-in-The-Loop experiments. Smart charging and standards related to adaptive charging controls are also part of this research area.

Mr. Bohn has worked for each of the U.S. based automobile manufacturers as well as various Tier I automotive suppliers and has also held an adjunct faculty position at the University of Wisconsin-Madison. He is the current Advanced Battery Technology Chair for SAE Congress, actively serves on battery and PHEV related SAE technical standards committees, and is the chair of the SAE Electric Machine Rating Standards task force. Mr. Bohn received his B.S. and M.S. in Electrical Engineering from the University of Wisconsin-Madison.

Farhad Bolourchi
Dr. Bolourchi is currently a staff research engineer II with Nexteer Automotive Innovation Center where he designs algorithms for advanced chassis systems. Farhad helped develop Delphi’s first electric power steering system, for which he received the company’s highest technical award, the “Boss Kettering”. Dr. Bolourchi previously worked for Hughes Aircraft Company and gained valuable experience in both missile systems controls and automotive applications. He was also a part time faculty member at the University of California - Davis and Sacramento State University. Farhad received GM’s President Honors award in 1998, and was inducted to Delphi’s Hall of Fame in 1999. He has numerous publications and patents related to control systems and automotive applications. Dr. Bolourchi has a B.S. in Mechanical Engineering from Northeastern University, a M.S. in Mechanical Engineering and a Ph.D. in Nonlinear Control Systems from the University of California - Davis.

Paul Bonenberger
Paul Bonenberger holds a B.S. in Industrial Engineering from General Motors Institute, a M.S. in Engineering Management from the Univ. of Detroit and a M.S. in Training and Development from Oakland Univ. He spent more than 35 years with the automotive industry in final assembly and production engineering where, for 25 years, he was a subject matter expert in mechanical attachments. In 1990, he recognized that no systematic explanation of snap-fit technology existed and set about gathering and organizing snap-fit design practices into a rational knowledge construct. He is now president of FasteningSmart, Inc., a consulting company specializing in product design and training in snap-fit and threaded fastener attachments. Mr. Bonenberger is the author of The First Snap-Fit Handbook.

Raymond M. Brach
Dr. Raymond Brach is a consultant in the field of accident reconstruction and a professor emeritus of the Department of Aerospace and Mechanical Engineering at the University of Notre Dame. He has been practicing and carrying out research in the field of accident reconstruction for over 35 years. Dr. Brach is a fellow member of SAE and a member of ASME, ASA, INCE, and NAPARS and is a licensed professional engineer in the state of Indiana. In addition to over 100 research papers and numerous invited lectures, he has authored the book, Mechanical Impact Dynamics, published by Wiley Interscience in 1991 and is a co-author of the book, Uncertainty Analysis for Forensic Science, published by Lawyers and Judges Publishing Company, 2004. Dr. Brach is also a co-author of Vehicle Accident Analysis and Reconstruction Methods, published by SAE International. He was granted a Ph.D. in engineering mechanics from the University of Wisconsin-Madison, and a B.S. and M.S. in mechanical engineering from Illinois Institute of Technology.

R. Matthew Brach
Dr. R. Matthew Brach is a principal member of Brach Engineering, a professional consulting firm that carries out vehicle accident reconstructions. He was previously an adjunct professor at Lawrence Technological University and has held engineering positions at Exponent Corporation, Ford Motor Company and MPC Products. Dr. Brach is a co-author of Vehicle Accident Analysis and Reconstruction Methods, published by SAE International. He has a B.S. in electrical engineering from the University of Notre Dame, an M.S. in mechanical engineering from the University of Illinois-Chicago, and a Ph.D. in mechanical engineering from Michigan State University.
James Breneman
Jim Breneman is currently a Statistical and Reliability consultant and instructor in the Mathematics Department at the Tri-County Technical College (South Carolina). Prior to that, Mr. Breneman held various technical and managerial positions with Pratt & Whitney (P&W) Division of United Technologies including; Supervisor of Applied Mathematics and Statistics Group; Manager of Reliability and Design Review Group; Safety, Reliability, Maintainability & Quality Assurance (SRM&QA) Manager for Rocket Programs; Manager of Reliability, Maintainability & Safety Engineering; Manager of Engineering Integrity for all P&W products; founder and leader of P&W's Engineering Technical University; Manager of P&W’s University R&D programs; and ACE Mentor (equivalent to Master Black Belt). Mr. Breneman has an extensive background in reliability, as both a P&W Fellow in Reliability Statistics and Risk Analysis, and an SAE Fellow. He has presented papers on reliability topics at various conferences. Mr. Breneman holds a B.S. in Mathematics from the University of North Carolina (Chapel Hill) and an M.S. in Applied Mathematics/Statistics from N.C State University.

David K. Callahan
David K. Callahan is a partner in the law firm of Kirkland & Ellis LLP in Chicago. His practice is focused on litigation in the areas of patent, trademark, trade secret, copyright and the Internet. He has participated in numerous bench and jury trials in Federal Courts, as well as appeals before the Federal and Seventh Circuits. In patent matters, he has represented clients in a diverse range of technologies, including semiconductors, abrasives, paper products, automotive products, business methods, cellular telephony, building products and agricultural equipment. In trademark actions, he has represented clients before Federal Courts, as well as the Trademark Office and the U.S. Customs Service. He also has extensive experience representing clients with respect to their rights in Internet domain names, including cybersquatting administrative actions to obtain domain names. He holds an A.B. from the Univ. of Chicago and a J.D. from the Univ. of Michigan Law School.

Bernard Challen
Bernard Challen is an independent engineering consultant, active mainly in the automotive industry. Currently serving as a member of the SAE International Board of Directors, his technical areas of interest include electronics and control, instrumentation, the use of computer-aided engineering tools, and vehicle noise & vibration. Until 1991, he was Technical Director at Ricardo Consulting Engineers where one of his responsibilities was the formation of Ricardo North America. His technical responsibilities within Ricardo included noise and vibration, instrumentation and control, large engines and the business development of Ricardo in North America. Mr. Challen is active in a number of professional societies. A recipient of the SAE Forest R. McFarland award in 1983, 1990 and 1996, he was elected a Fellow of SAE in 1997 and in 2008 he was the recipient of the SAE Medal of Honor. Mr. Challen is a Fellow of the Institution of Mechanical Engineers (iMechE) and also the Institution of Engineering Technology (IET). He has served as General Chair for the SAE Noise and Vibration Conference from 1992-2003. In addition to being a regular contributor of technical papers to SAE, he also serves on the Engineering Meetings Board. Mr. Challen earned a B.Sc.(Eng.) in Mechanical Engineering and M.Sc. Noise and Vibration, Institute of Sound and Vibration Research, from Southampton University.

K. T. Chau
K. T. Chau received his B.Sc.(Eng.) degree with 1st Class Honors, M.Phil. degree and Ph.D. degree all in Electrical & Electronic Engineering from The University of Hong Kong. He joined the alma mater in 1995, and currently serves as Professor and Director of the International Research Center for Electric Vehicles. He is a Chartered Engineer and Fellow of the IET. At present, he serves as Co-Editor of the Journal of Asian Electric Vehicles. Professor Chau has published over 300 refereed technical papers, co-authored a monograph, Modern Electric Vehicle Technology, and wrote two book chapters: “Electric Motor Drives for Battery, Hybrid and “Fuel Cell Vehicles” and “Hybrid Vehicles” in Electric Vehicles: Technology, Research and Development and Alternative Fuels for Transportation, respectively.

Professor Chau has received many awards: including the Chang Jiang Chair Professorship by the China’s Ministry of Education; the Environmental Excellence in Transportation Award for Education, Training and Public Awareness by the SAE International; the Award for Innovative Excellence in Teaching, Learning and Technology at the International Conference on College Teaching and Learning; and the University Teaching Fellow Award by The University of Hong Kong.

Timothy Cheek
Mr. Cheek is a Principal Engineer with DELTA [v] Forensic Engineering, Inc. Since 1993, Mr. Cheek has been active in the fields of forensic engineering and accident reconstruction. He has considerable experience in both the design and development of commercial trucks as well as with the investigation of accidents involving commercial vehicles. Mr. Cheek is a member of the SAE J2728 Heavy Vehicle Event Data Recorder (HVEDR) subcommittee of the Truck & Bus Council and an organizer of the SAE Congress technical sessions on Event Data Recorder technology and has authored publications on the subject of HVEDRs. He received his Masters of Science in Materials Science and Engineering from the University of Florida and is a Registered Professional Engineer in multiple states.

Bruce Chehroudi
Dr. Bruce Chehroudi is currently a Principal Scientist at the Engineering Research Corporation Inc. He has been a Chief Scientist at Raytheon STX (formerly Hughes Aircraft STX) and is a former Professor of Mechanical Engineering, specializing in fluid mechanics and heat transfer, laser optical diagnostics, internal combustion engines, structure of sprays (their formation and combustion), gas turbine engines, furnace combustion, fuel injection issues (reciprocating, gas turbine, and rocket engines) and emission of pollutants. Dr. Chehroudi previously served as a Research Staff Member at Princeton Univ. where he engaged in experimental research in fluid mechanics and heat transfer of cold, vaporizing, and combusting sprays as well as characterization of turbulence in internal combustion engines using laser optical diagnostics. He was actively involved in the DISC (direct injection stratified charged) Engine Program, a cooperative project between the Department of Energy, General Motors Research Laboratory, Sandia-Livermore Combustion Laboratory, and Los Alamos Scientific Laboratory. Dr. Chehroudi established and directed an Engine Laboratory at the University of Illinois where he conducted numerous research projects to investigate the formation of pollutants and heat transfer/ fluid mechanical aspects of combustion occurring in internal combustion and gas turbine engines. He is a member of Ta Beta Pi and the recipient of several SAE awards including the Arch T. Colwell Merit Award, the Ralph R. Teetor Award, the SAE Recognition Award and the SAE Forest R. McFarland Award in recognition of his contributions to the Professional Development Seminars. He has taught courses in the areas of internal combustion engines, thermodynamics, thermophysics of gas flows, combustion, and measurement system and has more than 100 publications in conferences, national and international journals. Dr. Chehroudi has a Ph.D. from Princeton University.

Howard Chesneau
Mr. Chesneau is the President of Fuel Quality Services, Inc. A recognized expert on fuel-related issues, he has over thirty years of experience in fuel additives, distillate fuel problems, fuel filtration, and tank remediation. Additionally, Mr. Chesneau has extensive knowledge and field experience in the area of microbial contamination and detection. Mr. Chesneau is on the IASH Board of Directors and is the past Chairman of the SAE Atlanta Section. He is an active
member of other professional organizations including SAE, AIAA, and ASTM. He currently serves on the IATA Working Group on Microbial Contamination, the ASTM Committee dealing with fuel from middle distillates to heavy oils, the ASTM Committee establishing specifications for biodiesel, and the ASTM Committee on jet fuel. In addition to his committee and working group activities, Mr. Chesneau has authored and co-authored many articles on the subject of fuel storage and handling that have been published in various trade magazines. Mr. Chesneau served as a commissioned officer in the US Army and holds a B.S. degree from the University of Florida.

Jeff Colwell
Dr. Jeff Colwell is a Principal Engineer in Exponent’s Thermal Sciences practice in Phoenix, Arizona where he specializes in the engineering analysis of thermal and combustion processes, especially the cause, origin, and propagation of fires and explosions. Dr. Colwell has particular expertise investigating fires associated with automobiles, recreation vehicles, motorcycles, and heavy trucks, where typical fire scenarios include post-collision fires, structure fires involving vehicles, and fires that occur while the vehicle is being operated. He analyzes how these fire scenarios, along with vehicle design, operation, maintenance, repair, and aftermarket equipment, are related to mechanisms of fire causation, growth rate, and spread. He has specialized expertise in designing and conducting both component and full-scale tests to evaluate these complex relationships. Prior to joining Exponent, Dr. Colwell held research positions at AlliedSignal Aerospace, the Combustion Laboratory at Arizona State University, the High Temperature Gas Dynamics Laboratory at Stanford University, and the Thermal Sciences and Propulsion Center at Purdue University. He has a B.S. in Mechanical Engineering from the University of Wyoming, a M.S. in Mechanical Engineering from Purdue University, a M.S. in Engineering from Stanford university and a Ph.D. in Mechanical Engineering from Arizona State University.

Jess J. Comer
Dr. Jess J. Comer has significant teaching experience in the areas of machine design, dynamics of machines, metal fatigue and failure analysis. He is co-author of the text Fundamentals of Metal Fatigue Analysis and is a registered Professional Engineer in South Dakota. Dr. Comer is a member of SAE, ASME and ASEE. He holds a B.S. and an M.S. in mechanical engineering from South Dakota School of Mines and a Ph.D. from the University of Illinois at Urbana-Champaign.

Richard J. Cover
Mr. Cover is currently President of Richard J. Cover & Associates, a consulting firm specializing in metals and materials engineering, investment analysis and market research. He previously worked for General Motors as the Global Commodity Manager-Steel and Manager of Supplier Quality-Steel for North American Metal Fabricating. Prior to joining General Motors, Mr. Cover spent over twenty years with LTV Steel in positions including Director of Marketing and Technical Services, Manager of Automotive Marketing, District Sales Manager-Automotive, and Manager of Automotive Technology. He also has experience in ferrous metallurgy research, reinforced plastics and test instrumentation. Mr. Cover has a B.S. in Metallurgical Engineering, a M.S. in Metallurgy and Materials Science, and a Master of Business Administration, all from the University of Pittsburgh.

L.L. ‘Buddy’ Cressionnie
Mr. Cressionnie is currently the Americas IAQG 9100 Team Lead responsible for maintenance, revision, and clarification of the AS9100 standard. He is active in standards development as a voting member of the US Technical Advisory Group (TAG) to ISO/TC 176 which writes ISO Quality Management System standards. He serves on the US TAG Interpretations Committee and is the Aerospace Sector Liaison to the US TAG. Mr. Cressionnie represents Lockheed Martin in these roles where he works in the Aeronautics Business Unit, a 31,000 employee operation across nine sites. He led the implementation of AS9100/ISO 9001:2000 standards and quality process area for Capability Maturity Model Integration (CMMI®) at Lockheed Martin Aeronautics into a centralized, integrated quality system. Buddy Cressionnie is an ASQ senior member with quality manager and quality auditor certifications. He is a certified RABQSA aerospace experienced auditor and International Register of Certified Auditors (IRCA) lead auditor for ISO 9001 and ISO 14001. Buddy Cressionnie received his MBA degree from Texas Christian University and Bachelor of Science in Engineering from the University of Florida.

Shuvra Das
Dr. Shuvra Das is Professor of Mechanical Engineering and the Associate Dean for Research and Outreach for the College of Engineering and Science at University of Detroit Mercy. His research and teaching interests include engineering mechanics, computational mechanics using finite and boundary element methods, modeling and simulation, inverse problems, mechatronics, modeling and simulation of mechatronics systems, condition based health monitoring of engineering systems, etc. Dr. Das, author of the text entitled Mechatronic Modeling and Simulation Using Bond Graphs has over fifty conference and journal publications and has received several awards, including the Best Teacher award from the North Central section of ASEE and the Junior Achievement award at University of Detroit Mercy. Dr. Das received his Ph.D. and M.S. degrees in Engineering Mechanics from Iowa State University. In addition, he received his B.Tech (Hons.) in Mechanical Engineering from the Indian Institute of Technology in Kharagpur, India.

James De Clerck
Jim De Clerck is currently the Structural Vibration Lead Engineer at the General Motors Noise and Vibration Center in Milford, Michigan. Jim has more than 20 years experience working and conducting research in the area of Noise and Vibration. Jim has been actively involved the GM Technical Education Program and recently completed teaching a graduate course in Automotive NVH at the University of Michigan. He is the author of more than 30 technical papers. Jim holds B.S., M.S. and Ph.D. degrees from Michigan Technological University.

Zhibing Deng
Dr. Zhibing Deng is currently a senior engineer specializing in side impact safety at Ford Motor Company. He has in-depth knowledge of side impact development, including setting targets for key vehicle components, developing & applying component/subsystem test methodologies, and implementing actual designs of vehicle components in achieving side impact performance targets. His work experience includes rear impact development and CAE support in front impact, roof crush and interior head impact. Prior to joining Ford, Dr. Deng was an Assistant Professor at South China University of Technology. He is a recipient of the Henry Ford Technology Award in 2005. Dr. Deng received a B.S. in Computational Mathematics and an M.S. in Applied Mathematics in China and a M.S. in Mechanical Engineering, M.A. in Statistics and Ph.D. in Applied Mathematics all from Wayne State University.

Eric Denys
Eric Denys is currently the Global NVH Director - Brakes at Material Sciences Corporation in Canton, Michigan. His career spans 16 years at Federal-Mogul and Material Sciences Corporation with technical specialization in brake NVH. Mr. Denys has lead teams to achieve best-in-class in brake squeal on numerous vehicle lines and is the recipient of the 2001 Ford Global Customer Satisfaction Award for his work on high mileage brake squeal reduction. His work has been published in numerous national and international papers, and in an SAE book on Disc Brake Squeal. He is a 6 Sigma Black Belt. Eric is co-chairman of the SAE Brake NVH Standards Committee. He received a B.S. in Mathematics from the Jean-Bart University, France and a M.S. in Mechanical Engineering from the University of Technology of
Compiègne, France. In 2010, he received his MBA from the University Of Michigan Ross School Of Business.

**Philip Dingle**

Philip Dingle is a Diesel Technology Specialist in the advanced engineering Innovation Center of Delphi Diesel Systems. He received his engineering education in England, and after graduating in 1972, joined the Research and Development group of Lucas Diesel Systems where he worked on several advanced engine and fuel system technologies. Transferred to Detroit, USA in 1975, he has worked closely with several US diesel engine manufacturers on the development of FIE for their engines. In the process, he gained broad experience in achieving performance and emissions targets from both DI and IDI combustion systems. He holds twelve US or European patents for fuel system innovation.

**Peter T. Dishart**

Peter T. Dishart manages the laminated glass business of PPG Industries Inc. He holds B.S. and M.S. degrees in mechanical engineering as well as an MBA. Dishart is a member of SAE and has served on the Glazing Committee. He is currently President of the Enhanced Protective Glass Automotive Association (EPGAA), an industry organization dedicated to laminated glass.

**Joseph Doyle**

Joseph Doyle is the principal of Strategic Insights, a Michigan-based consulting firm, specializing in executive leadership. He completed a 30-year career with General Motors Corporation, where he held a variety of management positions including; Internal Business Consultant with General Motors University, Senior Research Manager with the Corporate Organization Research and Development Activity, Manager of the Corporate Executive Development Activity, and Lead Consultant with the Corporate Strategy and Decision Support Activity. While at GM, he facilitated Global Task Teams in India, Indonesia, Thailand, England, and Australia and served as the Corporate Liaison on Leadership and Strategy to the US Army War College and the National Defense University. Prior to joining General Motors, Mr. Doyle held positions with the U.S. Public Health Service, Ford Motor Company and the Management and Organization Development Department of General Motors Institute (now Kettering University). Dr. Doyle served as a teaching fellow for the Hartwick Leadership Institute and was a member of the advisory council for the Academy of Management Executive Magazine. He was a member of the Advisory Board for the Institute for Management Studies as well as member of the National Research Committee for the American Society for Training and Development. Dr. Doyle has served as an adjunct professor and lecturer at the University of Michigan Dearborn’s School of Business, taught Engineering Administration at the University of Detroit’s Graduate School of Engineering and Business Strategy at Oakland University’s School of Business Administration. He holds a B.S. in Mathematics and Physical Science from Eastern Michigan University, a M.Ed. in Educational Evaluation and Research from Wayne State University and a Ph.D. in Organizational Behavior from the University of Michigan.

**Timothy Drota**

Timothy Drota is currently a product development engineer at Ford Motor Company where he specializes in chassis systems and vehicle dynamics for passenger cars and light trucks. He also has developed engineering training in suspension and steering. Previously, he worked for Saturn Corporation in product engineering. Tim is a member of the Course Industry Advisor Board for Chassis Systems Design at Kettering University, and a member of SAE and SCCA. He holds a B.S. in Mechanical Engineering from Lawrence Technological University and a M.S. in Mechanical Engineering from the University of Michigan.

**Gordon L. Ebbitt**

Gordon L. Ebbitt is a Manager of Advanced Acoustics at Carcoustics where he works with automotive sound package design and the development and validation of new acoustical and thermal materials and components. Mr. Ebbitt’s experience includes the CBS Technology Center on projects involving musical instrument research and development including modal and finite element analysis on pianos, guitars, and other instruments. Mr. Ebbitt also worked for Briel and Kjær headquarters in Denmark where he addressed sound quality instrumentation, sound intensity measurements, and material measurements. At Briel and Kjær in Michigan he was an application engineer supporting their U.S. staff and lecturing on sound quality, acoustical measurements, and other topics. Following B&K, Mr. Ebbitt joined Masland Industries (later Lear Corporation) as Chief Acoustical Engineer where he was responsible for the construction and operation of an acoustical laboratory, the development of vehicle sound packages, full vehicle modeling using SEA, and acoustical product development. Mr. Ebbitt is a member of SAE, INCE, ASA, AES, and ASTM. Mr. Ebbitt received a B.A. in Mathematics from New York University and M.S. in Acoustics from The Pennsylvania State University.

**Ed English**

Mr. English is currently Vice President & Technical Director for Fuel Quality Services, Inc. where he oversees all aspects directly related to the research, development, and deployment of chemicals, antimicrobials and detection equipment for use in the various stages of the petroleum and biomass fuels industry from the refinery to the end user. He is also responsible for evaluating regulatory and industry issues, compliance with federal and state regulations, formulating policy and implementing programs to address regulatory and industry issues, and performing technical reviews and program audits. Mr. English previously worked in the nuclear power industry. He is nationally recognized for his knowledge and expertise in the area of microbial contamination of fuels, alternative fuels, and materials compatibility and has been an invited speaker for such organizations as the EPA, FAA, CALCUPA, NEIWPCC, PEI, NISTM, and SAE, DuPont, and Biofuels Americas. Mr. English is also an active member of numerous professional organizations including SAE, IASH, IATA, and ASTM. He has a B.S. in Chemistry from the University of Florida and two years post-baccalaureate work from the University of Miami.

**David E. Ewel**

David Ewel is the President of Dewel, LLC, a company specializing in the design, manufacturing, and marketing of hydraulic and mechanical devices that utilize embedded electronic technology for mobile markets. With over thirty years experience in the field of electrohydraulics, Mr. Ewel previously held the position of Director of Engineering at MICO, Inc. where he was responsible for the development of a wide range of components for brake-by-wire and the development of ABS, traction control and electronic stability control systems for 4X4, 6X6 and 8X8 vehicles. While at the Hydraulics Division of Eaton Corp., Mr. Ewel held the positions of Chief Engineer for Electronics and Chief Engineer for Valves and led the development of electro-proportional and CAN based pump controls. As an engineer at Moog, Inc., he designed the first industrial servoauctor that integrated a cylinder, servovalve and position sensor with embedded electronics. Other designs included embedded ramp control of a proportional valve and embedded closed loop position control of a servovalve. In addition, Mr. Ewel has worked on a wide variety of servosystem designs to control position, velocity, force, and pressure in such diverse applications as lumber and steel mills, earthquake simulators, turbine gas valve control and active suspensions. Mr. Ewel received both a B.S. in Mechanical Engineering and a M.B.A. from the State University of New York at Buffalo.
Ken Farsi
Mr. Farsi is currently the VP of Engineering and ODA Administrator for Dassault Aircraft Services in Wilmington, DE, where his responsibilities include oversight of engineering groups and practices at all Dassault Aircraft Services locations. He has over 24 years experience in aircraft certification and operations and has worked for aircraft manufacturers, airlines and modification centers conducting certification work on small and large transport category aircraft. He is an FAA Designated Engineering Representative (DER) with Interior Arrangement and Compliance Inspection, as well as Aircraft Loading Document approval authority on Part 25 and 25 aircraft.

Mr. Farsi has taught aircraft certification and Federal Aviation Regulations as an Adjunct Instructor at Northrop-Rice Aviation Institute of Technology in Los Angeles, and Aircraft Systems at San Mateo Community College in San Mateo, California. He has participated in and managed FAA certification programs for major U.S., European, Chinese, and Australian airlines as a consultant. He is a life time member of Tau Alpha Pi, the honor society for Engineering Technologies. Along with a Bachelor of Science in Aircraft Maintenance Engineering Technology from Northrop University, Mr. Farsi has participated in graduate studies in Aerospace and Aviation Operations and Management at Embry-Riddle Aeronautical University. He holds FAA Airframe and Powerplant as well as Private Pilot Certificates.

Kelley Fling
Mr. Fling currently teaches fluid power at the college level. He has extensive experience in the fluid power field and was previously the R&D lab manager for a manufacturer of cylinders for the mobile market. He is a former chairman of the SAE A-6 Committee, Aerospace Fluid Power, Actuation, and Control Technologies and has led seal research programs sponsored by each of the three armed services. Mr. Fling holds two seal patents. He received a B.S. in Mechanical Engineering from Texas A & M University and a M.S. in Mechanical Engineering from Southern Methodist University.

Wes Fulton
Mr. Wes Fulton is the Founder and CEO of Fulton Findings. Prior, he was a program engineer/manager for AirResearch Los Angeles Division, Allied-Signal Aerospace Corporation. As a program engineer for aircraft actuation projects he had engineering and management responsibility for the Indigenous Defensive Fighter (IDF) leading edge flap actuation system (LEFAS) development and production, the Rockwell/MMB X-31A LEFAS flight test program, and the F-16 Fighting Falcon LEFAS production and deployment support. He co-patented a multi-fuseable shaft (high performance drive train device). Additionally, Mr. Fulton has over 20 years of programming experience as a private programmer and developed SuperSMITH®, Visual, WeibullSMITH™, LogNormSMITH™, Normal+SMITH™, Visual+SMITH™, BIWeibullSMITH™, and MonteCarloSMITH™ analysis software. He received his B.S.M.E. from Georgia Tech and his M.S.M.E. from California State University at Long Beach.

Paul E. Geck
Mr. Geck is currently an independent consultant specializing in advanced high strength steels. Previously employed by Ford Motor Company, Mr. Geck specialized in several areas including Computer Aided Engineering, Noise, Vibration and Harshness, both as a testing and CAE expert, and vehicle weight reduction with an emphasis on steel selection. Administratively, Mr. Geck served in several managerial and technical specialist roles. He was recognized as the Ford steel expert and chaired the Auto/Steel Partnership (A/SP) and the internal Advanced High Strength Steel Strategy Team. Mr. Geck has a B.S. and M.S. in Mechanical Engineering, a M.S. in Engineering Mechanics, and an M.B.A., all from the University of Michigan.

Geoff Goddard
Geoff Goddard is Professor in Motorsport Engineering Design and Head of the Vehicle Engineering Research Group in the School of Technology at Oxford Brookes University in the UK. Following a position in the gas turbine industry as a Rolls Royce University Apprentice, he joined Cosworth Engineering in 1970 and was later promoted to Chief Designer by Keith Duckworth. The engines he designed made the Cosworth name synonymous with winning including the F1 World Championship as well as World Sportscar, World Touring Car, and World Rallycar championships. Victories also spanned U.SAC, CART, F1000 titles, and many other prestigious events including the Indy 500, Le Mans, Monaco GP, and Monte Carlo Rally. The Cosworth design portfolio for advanced road engine included engines for Mercedes, Opel, Ford, Chevrolet, Pontiac, and VW, all establishing new industry benchmark standards.

In 1995, he joined TWR as Director of Engine Design responsible for the design and development of engines for clients including Aston Martin DB7, Volvo, Ducati, Renault, SAAB, Audi, GM, Ford, Nissan, and the Oldsmobile Aurora. Many of these programmes included the manufacturing and delivery of engines to the car production lines. Others made TWR and its clients synonymous with winning major championships including the British Touring Car Championship (BTCC), World Superbikes Championships, Indy Racing League Championships (IRL), Australian V8 Supercar Championships, plus many prestigious events including the Indy 500, Le Mans, Bathurst, and World Rally Championship events.

While working in these companies, he led the open design-led structure favoured by Duckworth, which allowed a free-flow of information across the boundaries of all technical areas, enabling design engineers to expand their knowledge and vision at an incredible pace. This was demonstrated by their winning results, making Cosworth the best post-graduate university in the world. By joining Oxford Brookes University, he brought some of this vision to their engineering courses and helped initiate new MSc courses in Racing Engine Design and Motorsport Engineering. He has also underpinned PhD research programmes for F1 clients and industrial programmes covering advanced combustion research into future fuels, nano-particle additives, and various championship winning racing programmes. Geoff’s external activities include Director of Geoff Goddard Engines Ltd consulting on engines, Ambassador for EEMS, the British Government’s Energy Efficient Motor Sport body, and co-chair for the SAE Motorsport Conference Engine and Drivetrain Panels.

Michael Grimmer
Michael Grimmer is a Staff project engineer with the General Motors Powertrain Division at the GM noise and vibration laboratory in Milford, Michigan. Mr. Grimmer has worked for GM for over 20 years in the powertrain noise and vibration area. His work has focused on noise requirement allocation technology; vehicle integration; engine design; noise development and problem solving of engine, transmission, and accessory systems; component bench test design; sound quality measurement and metric development; and signature analysis for engine defect detection. Mr. Grimmer received a B.S. in mechanical engineering from the University of Wisconsin-Madison and M.S. in mechanical engineering from the University of Michigan-Dearborn.

Suresh T. Gulati
Dr. Suresh T. Gulati was a Research Fellow in the Science and Technology Division of Corning, Inc. where he specialized in the behavior of glass, glass-ceramics and ceramics subjected to mechanical and thermal loads, their fatigue and fracture properties, and their long- term reliability. Before joining Corning, he held positions with Cornell University, the University of Colorado, and Continental Can Company. Dr. Gulati has authored over 200 publications in the areas of ceramic catalyst supports, fiber optics, liquid crystal display glasses, cathode ray tubes, space windows, automotive windshields, and stepper lenses.
made from high purity fused silica. He is a member of American Men and Women of Science and Who’s Who in Technology Today. Dr. Gulati has a Ph.D. in applied mechanics from the University of Colorado, an M.S. in mechanical engineering from Illinois Tech., and a B.S. in mechanical engineering from the University of Bombay, India.

**Thomas J. Hall**

Thomas J. Hall is currently the Manager of Engineering for Brake Systems of full size trucks and SUV’s for the Robert Bosch Chassis Systems Division. Prior to that, he was the Engineering Manager for System Design and Validation at ITT Automotive, Continental Teves. His experience also includes development of ABS, TCS and Stability Control Systems, responsibility for application system engineering principles and process to the brake industry and development and promotion of brake system proposals and advance braking technologies. Mr. Hall has a B.S. in mechanical engineering from the University of Michigan.

**Robert F. Hand**

Robert Hand has more than 40 years of experience in the measurement and control of noise and vibration. A former research engineer with the Acoustics and Seismics Laboratory at the University of Michigan, Willow Run Laboratories, he has served as the noise and vibration implementation control specialist for the Corporate Laboratories of Clark Equipment Company, and later the general manager of Clark Engineering Services. Mr. Hand founded Redbud Technology Group, a noise and vibration consulting business. He has served as chairman of the SAE Con. Ag. Sound Level Technical Committee and the CIMA Acoustics Committee, and has produced the SAE technical video tutorial, Basic Noise Control, and regularly teaches the SAE noise control seminar. Mr. Hand has lectured at the University of Michigan, University of Wisconsin and Western Michigan University, as well as participated in numerous SAE technical sessions, and has taken graduate studies at the University of Notre Dame and an active member of the SAE, INCE and ASA. He has a B.S. in electrical engineering from the University of Michigan and an M.A. in management from Nazareth College.

**Johanna Hassan Hollowich**

Ms. Hassan Hollowich is the founder and president of Potencium Limited, an international training and consulting company with clients throughout Europe, the Asia-Pacific, and the Americas. Recognized and respected as an international consultant, Ms. Hassan Hollowich has successfully facilitated international business solutions in over 20 countries for global reaching clients such as Boeing, GM, and Manitowoc. Known for her innovative and motivational style of training, she has presented more than 500 training programs as well as designed a variety of online learning courses. A native of England, Ms. Hassan Hollowich has offices in London and Los Angeles. She is an adjunct faculty member at the University of California, Los Angeles (UCLA) Extension Department of Engineering, Information Systems and Technical Management. Prior to forming Potencium, Ms. Hassan Hollowich was a senior consultant for Canning International UK and Rostrum Pharmaceutical Training, a division of MDS Pharma Services UK. Ms. Hassan Hollowich holds a Master’s Degree in Adult Learning and Education from the City University (London) with a focus on training intervention techniques, group dynamics, mentoring, and management development.

**William Haughey**

Bill Haughey is a respected consultant and instructor in the areas of Failure Modes Effects Analysis, Design for Manufacturability and Assembly, Design Review Based on Failure Modes, Design Review Based on Test Results, and other GD3 methodologies. He is a current member of the issuing committee of the SAE J1739 FMEA standard, SAE Automotive Quality and Process Improvement Committee; the SAE Automotive Electronic Systems Reliability Standards Committee; and the AIAG FMEA Fourth Edition Recommended Practice Committee. Mr. Haughey was recently approved to lead the development of a new SAE DRBFM Recommended Practice (J2886). Mr. Haughey formerly worked for GM, where he held various managerial, manufacturing, and engineering positions including Process Lead and Supervisor for FMEA and DSM/A. While at GM, Mr. Haughey also supported Tatsuhiko Yoshimura in the global implementation of the GD3 (DRBFM) methodology. Yoshimura considers Mr. Haughey to be a subject matter expert in the GD3 methodologies, including DRBFM and DRBTR. Mr. Haughey received a B.S. degree from the University of Michigan and M.S from Central Michigan University, and has the following certifications: Black Belt in GD3 (DRBFM and DRBTR); Master Design for Manufacturability and Assembly Engineer; and Certified Internal Auditor.

**Gary Hazelton**

Gary Hazelton is an Engine Lead Noise and Vibration Engineer for gasoline and diesel engines at General Motors Powertrain Division. He has more than 17 years of noise and vibration experience in engine, accessory drive system, and accessory component level measurement and analysis. Gary began his career in 1986 at Delphi Automotive Systems, in Lockport, NY, where he worked to improve air conditioning system and compressor noise levels. He then moved to Powertrain where he was responsible for accessory drive noise and vibration development, and component level benchmarking activities. Gary has a BSME degree from the University of Cincinnati, with a concentration in mechanical vibrations and acoustics.

**Barry W. Heathcotte**

Barry W. Heathcotte is an individual consultant specializing in training and consulting services on the subject of Geometric Dimensioning and Tolerancing. He has more than 30 years experience in the subject matter and has been a lecturer at both public and in-plant seminars and training programs. Mr. Heathcotte has trained more than 15,000 people from over 1,500 companies, the military, technical and trade schools, universities, and technical societies in the United States, Canada, Mexico, and Europe. He is a former designer, group supervisor and technical coordinator with the Babcock & Wilcox Company, where he worked on the breeder reactor and nuclear reactors for both commercial and military installations. Mr. Heathcotte has more than 40 years of industrial experience, is a Certified Manufacturing Engineer, a senior member of SME, and a member of ASME. He has been an active member of the ASME Y14.5 Committee on Dimensioning and Tolerancing since 1982 and is a nationally-recognized expert on its application and interpretation.

**Ronald Heck**

Dr. Ron Heck is currently an independent consultant. Previously, he was a research manager responsible for developing catalyst technology for Engelhard Corporation’s worldwide customers in automotive catalyst. He has worked on the development of catalytic processes in SCR NOx, NSCR NOx, automotive catalyst, diesel catalyst, PremAirTM catalyst systems, hydrogenation technology, ozone abatement, volatile organic compound abatement, ammonia oxidation, chemical feedstock purification and chemical synthesis. He is a member of American Men and Women of Science and Who’s Who in Technology Today. Dr. Heck is the author of over 80 publications in commercial applications of catalysts and holds 28 U.S. patents on catalytic processes. He is the co-author of the book with Dr. Farrauto entitled, Catalytic Air Pollution Control: Commercial Technology, and is the co-editor of the NewsBrief section of Applied Catalysis B: Environmental. Dr. Heck received his B.S. in chemical engineering and his Ph.D. from the University of Maryland.

**Edmund Herman**

Mr. Herman is President of Creative Concepts Company, Inc. Prior to establishing his consulting business, Mr. Herman worked for General Motors Corporation where he was responsible for new process development in the areas of draw die development for sheet metal stamping dies, mold development for sheet molding compounds, and...
pressure die casting dies and processes. He was instrumental in the shift from physical plaster developments to total CAD design of sheet metal draw die developments. Mr. Herman is also an experienced instructor and served as the Education Director for the Society of Die Casting Engineers (now the North American Die Casting Association). He has taught continuing education courses in die casting, stamping and injection molding through Oakland and Wayne State Universities. Mr. Herman is a registered professional engineer in the state of Michigan and has a Bachelor of Science in Industrial Engineering from General Motors Institute and a Master of Science in Industrial Engineering - Operations Research from the University of Michigan.

Craig J. Hoff

Dr. Craig J. Hoff is an Associate Professor of Mechanical Engineering at Kettering University, teaching the areas of thermal and mechanical design, with applications in automotive engineering and biomedical engineering. His research interests include loop heat pipes, electronic and vehicle thermal management, and alternative automotive powertrains. Dr. Hoff is the faculty advisor to the Kettering Formula SAE racecar team and is the Chair of SAE International’s Scholarship Committee. He is the co-author, with Dr. Gregory Davis, of the text Introduction to Automotive Powertrains.

Arthur E. Howle

Arthur E. Howle is NVH Senior Technical Specialist, Roush Industries, Inc. Mr. Howle’s career includes six years at a General Motors production facility and 27 years in vehicle development with Ford Motor Company. He has experience with many aspects of vehicle NVH, particularly powertrain and driveline related NVH including: front, rear, and all wheel drive architectures. He is an expert in the utilization of high tech testing and CAE to predict, identify, and solve difficult NVH issues. He has also been a major contributor to many advanced vehicle programs and launches. Mr. Howle has a BSME from General Motors Institute and a MSME from Ohio State University.

Emad Isaac

Emad S. Isaac is Chief Technology Officer for the Merey Corporation, an electronics development and manufacturing services company focused on the design, development, testing, validation and manufacturing of ruggedized electronic assemblies for harsh environments. Mr. Isaac oversees and is responsible for the strategic technical direction and development engineering across all products and platforms which include displays, telematics, and controllers. Mr. Isaac’s prior experience includes 15 years of broad responsibilities in the wireless communications, systems, and embedded technologies industries. Previously, he was Lead Systems Architect for Motorola’s Telematics Group, served on the Motorola Patent Committee, led several corporate wide innovation initiatives, identified new standards and standard bodies for regional and global Telematics, and served as Distinguished Member of Motorola’s Technical Staff. In addition, Mr. Isaac briefly served as vice-chairman for the SAE J1939 committee. Mr. Isaac has also held various leadership roles within the military, government, and aerospace industry prior to joining Motorola. Mr. Isaac holds several key patents and is a dedicated advocate of various projects and school programs that inspire children in the areas of Math, Science, and Engineering. Mr. Isaac holds two BS degrees in Applied Physics and Mechanical Engineering from McGill University. He also holds a MS in Biomechanics from the University of Arizona, as well as a Master of Engineering Management degree from Northwestern University.

Ali Jamnia

Dr. Ali Jamnia is an independent electro-mechanical engineering design and product development consultant for the medical, automotive and telecommunications industries. His experience covers areas in computational solid mechanics, fluid dynamics and heat transfer. His career began as a lecturer for Clemson Univ. and shortly thereafter, as a consultant for Reliance Electric (working on residual thermal stress calculations). His tenure continued when he joined Ansys, Inc. to develop technical short courses and seminars. Later, he joined Fluid Dynamics as a research scientist to develop projects under contract to Benz in Germany, Westinghouse and NASA. At Airtronic Services, Inc. Dr. Jamnia worked in the capacity of Director of Engineering and Research and focused his attention to developing products for the medical field. In his capacity as a program manager and later as a senior mechanical engineer at De Amertek Corporation, he developed several products for automotive industries. To this end, he has applied for four patents in 2004. He received his Ph.D. from Clemson University where his primary area of research was application of finite element methods to the hydrodynamic equations in the presence of shock waves and nonlinear fluid-solid interaction.

Jianzhong Jiao

Dr. Jianzhong Jiao is an internationally recognized lighting expert for light sources and lighting products design, technology development, testing, industry standards and government regulations. Dr. Jiao has been actively involved in professional and industry organizations and standardization activities. He is the Chairman of the SAE Lighting Committee, past Chairman of the Next Generation Lighting Industry Alliance (NGLIA), Chinaman of the NEMA SSL Section Technical Committee, and active member of IESNA Committees. ANSI-NEMA SSL Working Groups, UL LED Standard Technical Panel, as well as member of CIE, SPIE, ITE and other organizations. Dr. Jiao is the SAE Follow, and has received several industry awards.

Dr. Jiao holds a Ph.D. degree in Electrical Engineering from Northwestern University, a M.S. degree in Applied Physics, and a B.S. degree in Mechanical Engineering. He is titled to 9 U.S. Patents and has over 20 technical publications. Dr. Jiao currently serves as the Director of Regulations and Emerging Technologies at OSRAM Opto Semiconductors Inc. He also served as an adjunct professor teaching physics and electrical engineering courses at Purdue University and Lawrence Technological University. He has been teaching SAE seminars since 2003.

Paul Johnston

Paul Johnston is Senior Director of Compression and Braking at Meritor WABCO and is responsible for application engineering, product planning and new product development. Previously at ArvinMeritor, Johnston was Senior Director of the North American Foundation Brake Business Unit and Worldwide Director of Product Engineering for the CVS Worldwide Braking Division. He has over 38 years of experience in commercial vehicle air and hydraulic braking systems and products. A member of SAE International, Mr. Johnston was the recipient of the 2007 SAE Award for Outstanding Technical Committee Service. Mr. Johnston is active in the Truck & Bus Council, Truck & Bus Brake Committee, and related subcommittees to develop new brake products and system recommended practices. Mr. Johnston’s experience includes that of Chairman and member of the Heavy Duty Brake Manufacturers Council. He has been involved in the Technology & Maintenance Council and the Commercial Vehicle Safety Alliance regarding technical products and commercial vehicle practices. Mr. Johnston received a B.S. in Mechanical Engineering from Ohio Northern University, a M.S. in Mechanical Engineering from Cleveland State University, and a M.B.A. from Baldwin Wallace College.

Stephen Kang

Dr. Stephen Kang is currently a Technical Specialist in the Safety Core and Strategy Department of Ford Motor Company where he is responsible for developing safety methods such as component test methods, CAE methods and best practices. He was responsible for developing a truck program from beginning to production launch, and for meeting safety requirements. Dr. Kang has conducted occupant safety and CAE trainings; designed and conducted extensive dynamic component tests; established several Ford internal component design requirements and is responsible for the establishment of an Occupant
CAE database at Ford. Dr. Kang is the recipient of the Henry Ford Technology Award in 2005. He serves as an Advisory Board Member for TNO North America and is a certified six-sigma black belt. Dr. Kang has a Ph.D. in Biomechanics from Wayne State University.

B. V. Karlekar
Dr. Karlekar holds a B.E. in Mechanical Engineering from the Univ. of Baroda, India, an M.S. and a Ph.D. in Mechanical Engineering from the Univ. of Illinois - Urbana. He served as Head of the Mechanical Engineering Department at Rochester Institute of Technology. During his tenure there, Dr. Karlekar was awarded RIT’s Eisenhardt Outstanding Teacher Award, published numerous papers and authored three textbooks. Later, he was appointed Director of the Center for Integrated Manufacturing Systems. Dr. Karlekar is an ASME Fellow and continues to take active interest in Mechanical Engineering students at RIT by assisting them in the Engineering Learning Center.

Magdi Khair
Magdi Khair is an Institute Engineer in the Department of Emissions Research at Southwest Research Institute. He is experienced in the areas of engine testing and exhaust emissions control. His prior experience was with AlliedSignal Automotive Catalyst Company with the development of catalytic aftertreatment for light-duty and heavy-duty diesel engines; Ford New Holland with primary responsibility for the development of the 6.6 and 7.8 liter midrange diesel engines to meet 1991 emissions standards; Bendix Diesel Engine Controls where he led the development of advanced electronically controlled diesel fuel injection systems and also established several cooperative engineering programs with European and North American engine manufacturers; and with Chrysler Corporation where he converted the slant six gasoline engine into an open chamber, pilot injected, and electronically controlled diesel engine, supervised a combustion kinetics project, and participated in the design and development of electronic controls for a passenger car turbine engine. Mr. Khair holds 18 U.S. patents in electronic fuel injection, turbocharging, exhaust gas recirculation, and aftertreatment systems. He has also authored and co-authored numerous SAE and ASME papers. Mr. Khair received a B.S. in Automotive Engineering from Ain Shams University, an M.S. in Thermodynamics from the University of Birmingham, England, an M.B.A. from Michigan State University.

Kenneth Kipers
Dr. Kenneth Kipers has over 25 years of experience in additive synthesis, fuels, formulation, field testing, and customer service, is a Certified Lubrication Specialist and is currently involved in the consulting and training field specializing in fuels and lubricants. He is an adjunct professor at Richland College in Dallas and an instructor for Dale Carnegie courses, as well. Dr. Kipers has been an expert witness in many cases involving gasoline, diesel, and aviation fuels. He is also an active member of ACS, SAE, and STLE. Dr. Kipers received a B.S. from San Diego State University and a Ph.D. in physical organic chemistry from the University of California-Los Angeles.

Athanasios Konstandopoulos
Dr. Athanasios G. Konstandopoulos, recipient of the 2006 Descartes Laureate, is the founder and head of the Aerosol and Particle Technology Laboratory (APTL), a well-known European diesel emission control laboratory at the Chemical Process Engineering Research Institute (Cperi/CERTH) in Thessaloniki, Greece. In 2006, he was elected as Director of CPERI and member of the Board of Directors of the National Centre for Research and Technology-Hellas (CERTH). Since 2006, he has also been a member of the faculty of Chemical Engineering at Aristotle University in Thessaloniki. Dr. Konstandopoulos is a specialist in combustion aerosols and nanoparticles and he has extensive research and engineering consulting experience in the design, modeling, and testing of diesel particulate filter systems and monolithic reactors. Dr. Konstandopoulos, an SAE Fellow, has authored more than 70 scientific and technical papers and is a frequent invited speaker at conferences throughout the U.S. and Europe. His educational accomplishments include a Diploma in Mechanical Engineering from Aristotle University of Thessaloniki, an M.S. in Mechanical Engineering from Michigan Technological University and an M.S., MPhil and a Ph.D. in Chemical Engineering from Yale University.

Paul Kurowski
Dr. Paul Kurowski is a professor in the Department of Mechanical and Materials Engineering at the University of Western Ontario in London, Ontario. His teaching experience includes finite element analysis, machine design, mechanics of materials, kinematics and dynamics of machines, and product development. He is also the President of Design Generator Inc., a consulting firm specializing in product development, design analysis and training in Computer Aided Engineering methods. Dr. Kurowski has published multiple technical papers and taught professional development seminars for SAE International, the American Society of Mechanical Engineers, the Association of Professional Engineers of Ontario, the Parametric Technology Corp. (PTC), Rand Worldwide, SolidWorks Corp. and other companies and professional organizations. He contributes regularly to several engineering publications focusing on the implementation of CAE methods into the product development process. He is a member of SAE International and the Association of Professional Engineers of Ontario. Dr. Kurowski obtained his M.Sc. and Ph.D. in Applied Mechanics from Warsaw Technical University and completed postdoctoral work at Kyoto University.

DeWitt Lampman
DeWitt Lampman is a Staff Engineer with PPG Glass Research, where he has been in the Automotive OEM Process and Product Development Division since 1973. Mr. Lampman was a major contributor to the development of thin laminated sidekies, where he was involved with developing product specifications and process capability requirements for production, and conducting modeling and stress level measurements on vehicles to define glass and door design specifications, having worked with four automobile manufacturers in these areas. To date, Mr. Lampman holds seven U. S. Patents. Mr. Lampman graduated with a B.S. degree in Ceramic Engineering from Alfred University, Alfred, NY.

Michael Levin
Michael Levin holds the position of Technical Expert at Ford Motor Company. Mr. Levin has been with Ford Research and Advanced Engineering since the late 1970s. His current responsibilities include development of hydrocarbon and urea dosing for advanced Diesel aftertreatment systems. Mr. Levin co-authored 18 publications and holds 13 patents. He received his MSME in 1974 from Moscow Automobile and Road Institute in Russia.

Russell E. Levine
Russell E. Levine, P.C., CLP, is a partner in the law firm of Kirkland & Ellis LLP where he specializes in patent infringement litigation and patent licensing. He has over 20 years of experience. During his career, both as lead counsel and in conjunction with other Kirkland & Ellis partners, Russell has litigated over 200 patents and has analyzed and counseled clients with respect to several hundred more. He has obtained over $100 million for his clients through settlements, awards and licensing revenue. He also has successfully defended his clients from damages claims totaling in the billions. He has represented clients and continues to represent numerous Fortune 500 companies and other small and large publicly-held and privately-owned entities. He has litigated matters involving a broad array of patented technology such as automotive wheel aligners, wheel balancers, digital camera technology, and semiconductor memory chips. He currently serves as an International Delegate to the Licensing Executives Society International (LESI) organization and as Chair of the LESI Patent and
Abul Masrur

Dr. Masrur currently works for the US Army RDECOM-TARDEC (Research Development and Engineering Command), in the Ground Vehicle Power and Mobility Department within TARDEC (Tank Automotive Research Development & Engineering Center), where he is involved in vehicular electric power system architecture concept design, modeling and simulation, electric power management, and military applications. He previously worked with the Scientific Research Labs of Ford Motor Company where he was involved in research and development related to simulation and control for electric drives for electric and hybrid electric vehicles and power electronics, advanced automotive electric energy management, electric active suspension systems for automobiles, automotive multiplexing systems, electric power assist steering, and automotive radar applications, including the Computer Aided Engineering development and simulations for such applications. Dr. Masrur has authored more than sixty publications and has co-authored eight U.S. patents and is the recipient of SAE’s Environmental Excellence in Transportation Award in Education, Training and Public Awareness. He has a B.S. in Electrical Engineering from Bangladesh Engineering University, a M.S. in Computer Engineering from Wayne State University, a M.Eng. in Electrical Engineering from the University of Detroit and a Ph.D. in Electrical Engineering from Texas A&M University.

Ronald D. Matthews

Professor Ron Matthews, currently serving as a member of the SAE International Board of Directors, is Head of the General Motors Foundation Engines Research Laboratory on the campus of the University of Texas at Austin. He has been actively involved in engines research for 35 years, including engine control systems since the initial introduction of on-board computers. Mr. Matthews, a Fellow of SAE International, founded the Formula SAE competition in 1981 and has been the Faculty Advisor for a Formula SAE team each year since. He has been author or co-author on over 200 technical papers and reports, mostly in the field of engines.

Harold E. McCormick

Harold McCormick is currently President of C-K Engineering Inc., an engineering firm specializing in providing analysis instrumentation gauging and other consulting services for engine and lubricant manufacturers. He was formerly Director of Engineering, Ramsey Plant TRW-Valve Division, with ongoing responsibility for research and product engineering. Mr. McCormick’s past experience there includes design engineer for retaining rings, project engineer, conducting programs to develop automotive rotary shaft seals based on facets of the Ramsey product line, primarily in automotive piston rings, and chief engineer. He has also completed 57 graduate hours in Applied Mechanics and Metallurgy at St. Louis University. He holds more than 30 U.S. patents and has authored or coauthored numerous technical papers for the SAE as well as other automotive engineering organizations. Mr. McCormick holds a B.S. in mechanical engineering from University of Missouri-Rolla and an MBA from St. Louis University.

W. Mark McVea

Dr. McVea is founder and chief technical officer of KBE+, Inc., where he designs and develops complete powertrains for automotive and off-highway vehicles. He also holds a dual position as both a professor of Vehicle Dynamics in the Mechanical Engineering department and a professor of Information Technology in the B. Thomas Golisano College of Computing and Information Sciences at the Rochester Institute of Technology. He also teaches at Purdue University in their Automotive Sciences department.

Mark was formerly a manager of the CAE group within a tier-one powertrain supplier to world automotive markets, a consulting engineer in vehicle dynamics with Gear Consultants, Inc., and a project manager of traction systems for off-highway vehicles with
Clark-Hurth International. He has published extensively on the topics of transmission systems, automated design assistant systems, knowledge systems and knowledge based engineering in general. Dr. McVea holds a B.S. in Mechanical Engineering from the Rochester Institute of Technology, a Ph.D. in Design Engineering from Purdue University and is a licensed Professional Engineer.

Chris Mi
Dr. Mi is currently an Associate Professor at the University of Michigan - Dearborn, and Chief Technical Office of IPower Solutions, Inc. His teaching and research interests are in the areas of power electronics, hybrid electric vehicles, electric machines and drives, and renewable energy and control. At IPower Solutions, Inc., he is responsible for the powertrain electronics, plug-in hybrid electric vehicle battery management systems, energy engineering solutions, and technical strategy. Prior to that, he worked with General Electric as an Electrical Engineer responsible for the design and development of large electric motors and generators. In addition, Dr. Mi has also worked in China for the Rare-Earth Permanent Magnet Machine Institute of Northwestern Polytechnical University and the Xi’an Petroleum Institute and was a visiting scientist at the University of Toronto. Dr. Mi is the recipient of many awards including the Government Special Allowance (China), Technical Innovation Award (China), the Distinguished Teaching Award from the University of Michigan - Dearborn, and SAE’s Environmental Excellence in Transportation Award in Education, Training and Public Awareness and has published more than 80 papers. Dr. Mi received a B.S. and M.S. in Electrical Engineering from Northwestern Polytechnical University, Xi’an, Shaanxi, China, and a Ph.D. in Electrical Engineering from the University of Toronto, Canada.

Gerald J. Micklow
Gerald Micklow, Ph.D. PE is currently a full professor of Engineering at East Carolina University and is a licensed engineer in the state of North Carolina. For nearly three decades, Dr. Micklow has been actively involved in the design and evaluation of advanced power producing systems. Dr. Micklow’s research over the years has been heavily funded by NASA, the National Science Foundation, the Department of Energy, the Federal Aviation Administration, Argonne National Labs and others with the majority of the work being related to fuel injection and low pollutant emission combustion systems for aircraft and on-road and off-road automotive/trucking/machinery applications. Dr. Micklow has received numerous awards from NASA including being inducted into the NASA/U.S. Space Foundation Innovative Technology Hall of Fame in 2000 and receiving the NASA Space Act Award for work performed on the Space Shuttle in 2002. In addition, Dr. Micklow’s industry experience includes eight years of designing advanced aircraft and missile configurations where he maintained top-secret security clearances. With well over 60 engineering publications, Dr. Micklow received both a B.S. and M.S. in Aerospace Engineering from Pennsylvania State University and a Ph.D. in Mechanical Engineering from Virginia Polytechnic Institute and State University.

Cindy Miller
Cindy A. Miller is currently an Engineering Specialist at Cessna Aircraft Company. Ms. Miller is the lead human factors engineer working on new development programs such as the CJ4 and 850 Columbus projects. Ms. Miller is a member of HFES and AOPA and holds a private pilot license. She has a B.S. in Mechanical Engineering from Milwaukee School of Engineering, a MAS in Aviation Safety and Management from Embry-Riddle University, a M.A. in Human Factors Psychology and is currently ABD for her doctorate in Human Factors at Wichita State University.

Douglas J. Nelson
Dr. Douglas J. Nelson is currently a professor of mechanical engineering at Virginia Polytechnic Institute and State University. He teaches undergraduate and graduate courses in fuel cell systems, advanced technology vehicles and design. Director of the U.S. Department of Energy GATE Center for Automotive Fuel Cell Systems, his current research is on fuel cell hybrid vehicle systems simulation and validation and AC motor development. A member of SAE and ASME, Dr. Nelson received the Ralph R. Teetor Educational Award from SAE International in 1996, and the NSF FutureCar Faculty Advisor’s Award in 1998. He holds a B.S., an M.S. and Ph.D. in mechanical engineering.

Michael J. Oliver
Michael J. Oliver is Vice President of Electrical / EMC Engineering at MAJR Products Corporation, where he is responsible for customer EMC design and consulting and new product development. He is also the company’s ISO-9001:2000 management representative. An expert in EMI/RFI shielding technology, he has experience in electronics, military shelter electrical systems, and high power antenna/radome design. His experience also includes the design and testing of aerospace antennas, shielding of military shelter electrical systems, and discrete EMC shielding components. Mr. Oliver has expertise in open and anechoic chamber radiated testing to military standards and has utilized various antennas and radiated test systems. In addition, he has written numerous technical papers and publications on electromagnetic shielding components, product testing and design, and military antenna/radome test methodology standards. Mr. Oliver is the founder and currently serves as Chairman of the IEEE Pittsburgh EMC Chapter. He is Co-Chairman of the SAE AE4 Electromagnetic Compatibility Committee, and a member of the IEEE EMC Standards Advisory Coordination Committee (SACC). Mr. Oliver has three patents (one pending) on EMC shielding-thermal management devices and he received a B.S. in Electrical Engineering Technology from Gannon University.

Joseph Palazzolo
Joseph Palazzolo is employed at GKN Driveline Torque Technology Group where he manages the mechanical design and development of new automotive torque transfer devices, concepts, and integration into production applications. He previously held positions at Visteon Corporation, Warn Industries, and Ford Motor Company. Mr. Palazzolo is an ASE certified Master Technician, chaired the SAE All-Wheel Drive Standards Committee, and has been an active SAE member since 1990. Mr. Palazzolo is a recipient of the SAE Forest R. McFarland Award for distinction in professional development and education. He has received numerous patents for his work and creativity in advancing mobility systems. He holds a Bachelors degree in Mechanical Engineering from Cleveland State University and a Masters degree in Automotive Engineering from Lawrence Technological University.

Vincent Piacenti
Mr. Piacenti is Manager, Systems Engineering for Bosch Corp. He is responsible for systems engineering of all diesel fuel injection systems and components used in the US, including diesel fuel injection hydraulic systems integration for North American diesel engine applications. This encompasses simulation, adaptation and testing of high-speed, high-pressure fuel injection systems with a concentration on common rail systems, both solenoid-valve and piezo. Included is research of alternative fuels for diesel engine applications. He has experience in all types of diesel fuel injection and various gasoline systems and is a contributing author to the Springer Handbook for Mechanical Engineers. Mr. Piacenti holds a B.S. in Mechanical Engineering and has been with Bosch for almost thirty years, seven of which were at the Bosch Headquarters for Diesel Fuel Injection in Stuttgart, Germany.
Jeffrey A. Pike

Jeffrey A. Pike is President, Biomechanics Consulting, Inc. and Adjunct Professor, Biomedical Engineering, Wayne State University. He previously held the position of Senior Technical Specialist, Occupant Injury/Biomechanics, Ford Motor Company, from which he recently retired. He has extensive professional experience in biomechanics, injury mechanisms and causation, occupant protection, testing, regulatory requirements and regulatory process and medical records review. Mr. Pike has organized and presented at numerous technical forums, including sessions at two White House Conferences as well as SAE Symposia on Vehicle Rollovers, Occupant Protection and Lower Limb Injuries. He has also taught SAE regulatory and forensics seminars for 21 years and has been a guest lecturer at MIT, the Medical College of Wisconsin, the University of Michigan, Harvard Medical School and the University of Virginia. Mr. Pike is an SAE Fellow and received the Forest R. McFarland Award in 2004 for his contributions to SAE professional development activities. His publications include technical papers, book chapters and principal author of two textbooks published by SAE: Automotive Safety: Anatomy, Injury, Testing and Regulation and Neck Injury: The Use of X-Rays, CT’s and MRI’s to Study Crash-Related Injury Mechanisms. His educational background includes studies at Polytechnic Institute of Brooklyn, New York University and the University of Michigan.

Juan R. Pimentel

Dr. Juan R. Pimentel, Professor of Computer Engineering at Kettering University in Flint, Michigan, is an expert in the area of safety-critical systems and computer networks, particularly issues related to real-time protocols, safety-critical protocols, dependable automotive embedded systems, and distributed embedded systems. He has performed extensive research in the U.S., Germany, Spain, and Colombia and is a recognized international expert in the area of industrial communications and real-time protocols. In 2001, Dr. Pimentel was a Fulbright scholar performing teaching and research in the area of dependable embedded systems at the Universidad de los Andes, Bogota, Colombia. In 1987-88, he was a Guest Professor at the Fraunhofer Institute in Karlsruhe, Germany, where he developed an industrial LAN encoder used in a German National Standard (DIN). From 1991-1993, he was a visiting Research Professor at the Universidad Politecnica de Madrid, Spain where he worked on a research project on autonomous intelligent mobile robots. He has participated in several projects with GM, Visteon, Delphi, and Vector CANTech Inc, and has authored books on computer networks and multimedia systems.

Alexander (Alex) J. Porter

Alexander J. Porter is the Chief Engineer for Programs, Performance, and Durability for Intertek, and has been with the company since 1992. Since 1996, he has been developing accelerated testing methods for mechanical components and systems. Mr. Porter has three patents relating to accelerated testing equipment and has authored over 40 articles and technical papers on accelerated testing. Alex is the author of the book, Accelerated Testing and Validation, Elsevier 2004. His work in the past has included implementation of FEA in a laboratory setting and development of a thermal management system for an advanced data acquisition package developed by NASA’s Dryden Flight Research Facility. Alex is a member of SAE and IEEE. He holds a B.S. in aircraft engineering and an M.S. in mechanical engineering, both from Western Michigan University.

Thomas Prucha

Thomas Prucha is Principal Applications Engineer at Protean Electric, Inc., a manufacturer of in-wheel electric motor propulsion systems for vehicles. Mr. Prucha is responsible for the continuing development, demonstration, and maintenance of Protean’s vehicle fleet in North America. Prior to his current position, he was a Sr. Technical Specialist at FEV, Inc., a world-renowned vehicle integrator for hybrid and electric vehicle applications. Mr. Prucha has more than 30 years of engineering experience in automotive powertrain, mechanics, and electronics. He has specialties in Model-based design, Rapid Controller Prototyping, high voltage power distribution systems, Energy Storage Systems, and all aspects of hybrid and electric vehicle control systems.

Sam Reddy

Dr. Reddy is currently a Technical Fellow in the Chemical and Environmental Sciences Laboratory at GM Research and Development Center. Prior to that, he was a Principal Research Engineer in the Fuel and Lubricants Department. Dr. Reddy has been working on evaporative emission research and development for more than twenty years with significant research in the area of diesel fuel cold temperature wax plugging problems and diesel fuel stability. He holds twenty six U.S. patents and has authored ten SAE papers in the same field. Dr. Reddy obtained his B.S. CHE from Osama University in India, M.S. CHE from UCLA, and Ph.D. CHE from the University of Michigan and is a licensed engineer in the state of Michigan.

Thomas Reinhart

Thomas Reinhart is Program Manager for NVH in the Engine, Emissions, and Vehicle Research division of Southwest Research Institute. Previous roles include Senior Manager for NVH at Visteon Chassis Systems, where Mr. Reinhart was responsible for the NVH analysis and development of axles, driveshafths, and power steering systems. From 2001 to 2004, he was NVH Program Manager at Roush Industries, Inc. where he was responsible for NVH testing and development of diesel and gasoline engines, as well as transmissions, axles and accessories. Diesel fuel system noise was a special focus of this work. Prior to Roush, he was Director of Noise & Vibration Technology at Cummins, Inc. Mr. Reinhart has been involved in solving noise and vibration issues in engines, as well as in a wide variety of engine applications, including pickup trucks, heavy duty trucks, construction equipment, and marine. Mr. Reinhart has developed noise reduction features for diesel engines, four of which have been patented. He has published 15 technical papers on Powertrain NVH topics. Mr. Reinhart received his B.S. and M.S. in mechanical engineering from Purdue University. He also spent a year studying automotive engineering at the Technical University of Hannover, Germany. His master’s thesis focused on the application of acoustic intensity measurements to diesel engines.

Jack Rosebro

Jack Rosebro has taught hybrid, plug-in hybrid, and electric vehicle technology to a wide variety of industry professionals for the past seven years. He consults, writes, and conducts training seminars for Perfect Sky, Inc. throughout North America and Europe. Jack also writes on sustainable mobility for Green Car Congress. He received his M.Sc. in Engineering from Blekinge Institute of Technology in Sweden.

Jerry L. Roslund

Dr. Jerry Roslund is an independent consultant specializing in the Design of Experiments (DOE) and Reliability Methods. Prior to retiring from GM, he provided leadership as a GM Technical Fellow for Statistical Methods and Reliability and as a Validation Technical Integration Engineer at GM North America Vehicle Engineering. Specifically, Dr. Roslund conducted seminars on the Key Aspects of Quality, Reliability and Durability (QRD), Weibull Analysis, and Design of Experiments (DOE) for leaders and engineers within both GM and GM Suppliers.

Dr. Roslund joined General Motors at Detroit Diesel Allison, transferred to Saturn, and retired from GM in 2007. Dr. Roslund spent 24 years at General Motors solving problems using statistical methods and providing in-house consulting on a daily basis. He also developed numerous course textbooks and conducted over 200 seminars providing a wealth of experience and a vast number of case studies. Dr. Roslund is a member of SAE, ASQ, and the Society
of Reliability Engineers. He received his B.S. degree in Mechanical Engineering from the University of Nebraska, M.S.M.E. from Cleveland State University, and Ph.D. in Systems Engineering from Oakland University.

Phillip J. Ross
Phillip J. Ross is President of Quality Services International, Inc., a consulting firm specializing in quality and statistical training. He has accumulated over 4500 hours of classroom instruction teaching courses in quality, design tools, and manufacturing processes and problem solving in the United States, Great Britain, Holland, Japan, and Singapore. Prior to his consulting business, Mr. Ross worked for General Motors in automotive powertrain design and development and automobile manufacturing and assembly. He first worked with Allison Transmission Division in product design/development and then with Saturn Corporation in the manufacturing and assembly aspects. Mr. Ross was involved in the design phase of many transmission components and systems, developed statistical/quality methods and training, and performed process development. He also performed process development for lost foam casting, painting, molding, and others while at Saturn. Mr. Ross is the author of the book, Taguchi Techniques for Quality Engineering, which has sold over 35,000 copies worldwide, has had articles published in Quality Progress by ASQC and in Target by AME and is the holder of three patents on product design. Mr. Ross received a B.S. in mechanical engineering from General Motors Institute, and is an ASQ Fellow and Certified Quality Engineer.

Manfred C. Rumpel
Manfred C. Rumpel is the manager of the Chassis Systems Integration Department at the Ford Motor Co. His work is concentrated on analyzing and assessing suspension systems for meeting functional vehicle requirements, the scope of which spans from cars to light trucks. Mr. Rumpel’s previous work includes advanced chassis concepts design responsibilities. During this phase, he received 13 patent awards in suspension system design which have been incorporated in several production vehicles. Mr. Rumpel has more than 25 years of experience in the auto industry, including seven at Porsche A.G. in Germany where he conducted chassis systems design and analysis work on passenger cars, race cars and off-road vehicles. He received his degree in mechanical engineering in 1968 from the Engineering College in Kaiserslautern, Germany. He has taught courses on the global development process at the Univ. of Michigan and fundamentals in chassis systems engineering and design within Ford. Mr Rumpel has been a member of SAE since 1977 and is active in the SAE suspension, steering and chassis committee. He was chairman of that committee from 1992-1994.

Drexel L. Rutledge
Mr. Rutledge is currently an Aerospace Consultant with Integrity Engineering, Inc. where he works with several aerospace companies in the area of Product Support and Sustainment. His principal areas of expertise are in project management, technical information development and delivery, and proposal development activities. Most recently, his expertise in performance based logistics and international support applications have been sought out by several DFW area providers. Prior to joining Integrity Engineering, Inc., Mr. Rutledge was employed by Lockheed Martin Aeronautics Company as the Systems Engineering Director responsible for developing and delivering the technical information needed to operate and maintain all aircraft manufactured or supported by Lockheed Martin Aeronautics by all U.S. and foreign operators.

Mr. Rutledge is a Certified Professional Manager, a Past Chairman of the Product Support Executive Board of Directors of the Aerospace Industries Association, a Past President and Chairman of the Board of Directors of the General Dynamics Management Association, a member of the Air Force Association, and an Honorary Lifetime Member of the International Office and Professional Employees Industrial Union. He has served as the Industry Representative and co-chair of multiple Department of Defense and Industry project teams including the 2003 Logistics Transformation Initiative. He is the recipient of the 2006 Leonard Ross Memorial Award for Outstanding Contributions in the field of Logistics. Mr. Rutledge has a Bachelor of Science in Business Management as well as a Master of Business Administration from LeTourneau University in Texas.

Pranab Saha
Pranab Saha, PhD, PE, INCE Bd. Cert., is the principal consultant and co-founder of Kolano and Saha Engineers, Inc., an independent professional engineering and consulting company in acoustics, noise and vibration control. A well-known authority on automotive noise control and body interior systems, Dr. Saha has directed and participated nationally and internationally in numerous advanced noise control engineering programs for OEM companies and their suppliers. Dr. Saha is the Lead Faculty Member of the SAE Vehicle Interior Noise Engineering Academy and has organized SAE topical symposia. He was the General Chairman of the 2005 SAE Noise and Vibration Conference. He is the past-chairman of the SAE Acoustical Materials Committee and has helped develop several standards in acoustics.

Dave Scaler
Dave Scaler is the owner of AdvantageMotorsports.com, a company that performs engineering and analysis in the field of racing data acquisition and produces data logger hardware, software and sensors for racers around the world. Celebrating his 25th year in the racing industry, Dave has worked as a race mechanic, engine builder, race engineer, and race team manager for Road Racing, Oval Track, Drag Racing and Bonneville teams. Dave has taught Data Acquisition seminars all over the US, and his practical, real-world training style has been well received in all forms of motorsports venues.

Steven R. Schmid
Dr. Schmid is an Associate Professor at the University of Notre Dame, where he conducts research and teaches courses in manufacturing, metal forming, tribology and design. Prior to joining academia, Dr. Schmid was a project engineer at Triodyne, Inc., a consulting firm specializing in machine and manufacturing/product consulting with a special emphasis on safety. As such, he has visited hundreds of manufacturing facilities as diverse as sugar cane plants in Hawaii to battery factories in Vermont, and has been a consultant to industry and government. He is a past recipient of the Society of Manufacturing Engineers John T. Parsons Outstanding Young Manufacturing Engineer Award, has won numerous teaching awards, and was named a Kaneb Center Teaching Faculty Fellow at the University of Notre Dame in 2003. Dr. Schmid has organized numerous conferences, and has written over 80 technical papers and eight books and book chapters. He holds a Professional Engineer’s license and is a Certified Manufacturing Engineer. Dr. Schmid is a graduate of the Illinois Institute of Technology and Northwestern University.
Peter J. Schubert
Dr. Schubert is currently a Senior Director of Research and Development at Parker Engineering, Inc. where he has served as principal investigator on engineering research grants from NASA, the USDA, the Department of Energy, and the General Services Administration. He has over twenty years experience in automotive electronics and was previously a Technical Fellow at Delphi Electronics & Safety where he worked on advanced crash sensing and occupant detection methods. Dr. Schubert teaches vehicle rollover sensing and discrimination algorithms for SAE, has taught numerous courses in model-based design, and delivered an introduction to nanotechnology for the U.S. government. He has 26 U.S. patents and over 50 technical publications covering a wide range of engineering fields. Dr. Schubert has a B.A. in Physics from Washington University, a M.S.E.E. in Electrical Engineering from the University of Cincinnati, and a Ph.D. in Electrical Engineering from Purdue University.

Howard (Lon) Scott
Lon Scott is currently the Vice President of Operations for SL King & Associates, an engineering services firm located in Atlanta, Georgia. His principal areas of expertise include management of engineering and support teams as well as providing the processes and tools necessary to successfully coordinate and accomplish major technical design tasks. Prior to joining SL King & Associates, Mr. Scott worked for Lockheed Martin Corporation, an aircraft and defense product manufacturer. As a Senior Manager and Director he was responsible for providing top level system engineering integration and coordination relating to the design and development of aircraft and associated support systems for foreign and US military programs. Mr. Scott’s professional affiliations include AIAA, the National Defense Industrial Association, SAE and the National Management Association. He received a B.S. in Electrical Engineering from the University of Texas at Arlington.

Jörge Segers
With an educational background in automotive engineering, Jörge Segers has been involved with racing disciplines such as GT and sportscar racing, single seaters, and touring cars since 1998. He began with an apprenticeship at PK Carsport (formerly GLPK Racing), a Belgian team active in international GT racing. Mr. Segers became the team manager only three years later. After finishing his studies, he was employed at BPR Competition Engineering as track engineer in the International Sports Racing Series and later as development manager at Eurotech Racing. At Eurotech, he was responsible for the GT racing activities of British sportscar manufacturer Marcos Cars. In 2001, Mr. Segers became the youngest team manager ever in an FIA organized championship. At PK Carsport he is still responsible for the team’s activities and the FIA GT Championship. Subsequently, he has been working for other teams such as Henrik Roos Motorsports (FIA GT), Racing for Holland (Le Mans 24 Hours) and Carsport Modena. SAE published Mr. Segers’ first book, Analysis Techniques for Racecar Data Acquisition, in 2008.

Andrew F. Seybert
Andrew F. Seybert, Ph.D., P.E., is a Professor of Mechanical Engineering at the University of Kentucky where he has been a faculty member since 1977. In 1996, Dr. Seybert helped organize the Vibro-Acoustics Consortium, a group of companies interested in the development and use of noise prediction technology. He has been active in the development of numerical methods in acoustics and vibrations, particularly boundary element methods. Dr. Seybert is a Fellow of the Acoustical Society of America and of the American Society of Mechanical Engineers. He remains active in SAE and the IAV. Dr. Seybert received a B.S. degree from the University of Cincinnati and M.S. and Ph.D. degrees from Purdue University.

Charles F. Seyboldt
Mr. Charles Seyboldt has degrees in Mechanical Engineering and Law. He has over 15 years of experience in the transportation industry, having engineering responsibilities covering a broad range of product and manufacturing technologies. He is a registered Professional Engineer and a registered patent agent.

Ramesh K. Shah
Dr. Ramesh K. Shah is currently with Subros Ltd, New Delhi, India. Previously he was with Delphi Harrison Thermal Systems and General Motors Corporation for almost 30 years. During 1995-97, he was the Professor and Chairman of the Dept. of Mechanical Engineering at the Univ. of Kentucky. He has taught short courses and presented keynote lectures/seminars on heat exchanger design at various universities and research institutes in 30 countries worldwide. He is extensively published in the areas of heat exchangers and laminar internal flow forced convection. Dr. Shah is Co-Founder and former Editor-in-Chief of the international journal, Experimental Thermal Fluid Science. He is the past President of the Assembly of World Conferences on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics. Dr. Shah’s business career includes all aspects of automotive heat exchangers and air-conditioning and engine cooling systems. He is a member of the Society of Automotive Engineers, an SAE Fellow and a Fellow of the ASME, where he served as the Chairman of the Heat Transfer Division and a Technical Editor of the Journal of Heat Transfer. He has received many awards including ASME Heat Transfer Memorial Award and AIChE D.Q. Kern Award. He received his B.E. from Gujarat University, India, and M.S., Engineer, and Ph.D. degrees from Stanford University.

S. M. Shahed
Dr. S. M. Shahed is Corporate Fellow at Honeywell Turbo Technologies, a business unit of Honeywell International, where he has developed and applied advanced boosting technology to reduce emissions and improve the fuel economy of gasoline and diesel engines for passenger cars, commercial vehicles and equipment. He previously worked for Cummins Inc. and Southwest Research Institute and held faculty positions at the University of California and the University of Texas. He is a Fellow of SAE, ASME and the Institution of Engineers. Dr. Shahed served as 2002 President of SAE International. He has received several prestigious international awards including the I.Mech.E James Clayton Award, the SAE Horning Memorial Award, the SAE Arch Colwell Award and the University of Wisconsin Distinguished Service Citation. Dr. Shahed holds a B.E. degree from India and an M.S. and Ph.D. from the University of Wisconsin-Madison.

Murray Sittsamer
Murray Sittsamer is founder of Luminous Group, a consulting firm specializing in streamlining and standardizing workflow for companies. Murray has over 22 years experience in operations management, strategic planning, new process launches, financial analysis, quality systems and process improvement. During the past ten years Murray has focused his work on supporting automotive OEMs and suppliers with their quality and productivity improvement efforts, especially in the areas of Advanced Product Quality Planning (APQP), Failure Mode and Effects Analysis (FMEA), variation reduction and Problem Solving. Before entering the consulting field in 1994, Murray served as director of distribution support and quality systems for Gelman Sciences. While there he led a successful 15-month effort to obtain ISO 9000 quality system registration and had the role of project manager for a highly publicized groundwater contamination dispute. Murray earned his undergraduate degree in industrial engineering from the University of Pittsburgh and holds a Master of Science in Industrial Administration from Carnegie Mellon University.
Darrell W. Smith
Dr. Darrell Smith is a consultant in metallurgy and materials and is Professor Emeritus of Metallurgical Engineering at Michigan Technological University. Prior to joining the faculty at MTU, he was employed as a process metallurgist by Babcock and Wilcox and as a research metallurgist by General Electric. Dr. Smith has conducted extensive continuing education seminars related to metals and materials and engineering, including corrosion and oxidation. He has published approximately 50 research papers in archival journals related to specific aspects of materials science and engineering. Dr. Smith, a Fellow of ASM International and APMI International, has served on the Boards of Directors for both organizations. He is the recipient of the Distinguished Educator Award from ASM and the Distinguished Service to Powder Metallurgy Award from the Metal Powder Industries Federation. Dr. Smith has a B.S.-Met E. from Michigan Technological University and a M.S.-Met. and Ph.D. from Case Western Reserve University.

Joseph Sorrentino
For nearly three decades, Joseph Sorrentino has been instrumental in implementing successful quality management systems for commercial companies, military and aerospace contractors, and government agencies throughout the U.S. As president and CEO of Lean Quality Systems, Inc., Sorrentino specializes in implementing new standard methods for the corporate sector and has successfully worked with more than 25 corporations in the southern California area alone. A retired U.S. Navy quality assurance specialist, Sorrentino is certified as a level III examiner for visual, magnetic particle, dye penetrant, and ultrasonic inspections. He began his career as a quality management professional in the U.S. Navy, initially as chief petty officer, level III NAVSEA examiner/quality assurance division officer and spent eight years as a GS1910 quality specialist.

Sandep Sovani
Dr. Sovani is currently the Technical Account Manager for the North American Automotive Industry Sector with ANSIYS Inc., where he specializes in automotive applications of Computational Fluid Dynamics. Dr. Sovani has over fifteen years experience conducting research and executing projects on a wide variety of topics in automotive thermo-fluid sciences. During his career he has worked with ANSIYS Inc, Fluent Inc, the Thermal Sciences and Propulsion Center of Purdue University and the Engineering Research Center of Tata Motors. He has authored over forty papers, articles, and technical reports and is a member of SAE, ASME, and Sigma Xi. Dr. Sovani is a three-time recipient of SAE’s Excellence in Oral Presentation Award, the SAE Board of Directors Distinguished Speaker Award, and the National Talent Search Award from India’s National Council for Educational Research and Training. Dr. Sovani holds three degrees in Mechanical Engineering - B.Engg. from the University of Pune, M.Tech from the Indian Institute of Technology, Chennai, and Ph.D. from Purdue University.

Robert G. Speirs
Robert Speirs is Associate Professor of Plastics Programs at Ferris State Univ. Additionally, Speirs instructs many plastics engineering technology seminars covering material selection, product design and advanced plastics processing. Along with his vast teaching experience, Speirs brings practical industrial experience from his work with Baxter Travenol Laboratories and Dow Chemical. Speirs also has taught continuing education seminars in injection molding, mold design and injection molding troubleshooting for molders throughout North America and in Singapore and Hong Kong.

Erik Spek
Mr. Spek is a consultant in the field of energy storage focusing on the applications of advanced battery systems for traction, utility and emergency purposes and the development of production facilities for advanced batteries. He is also Director of Engineering for Innovative Testing Solutions, a third party provider of electrical and mechanical testing services. He has been active in the electric vehicle, advanced battery systems and electrical products industries for over twenty years. Mr. Spek has held key technical and management positions with ABB Advanced Battery Systems, Powerplex Technologies, Magna International, Canadian General Electric, Black and Decker and White Motor Corporation. His scope of experience in the automotive sector encompasses engineering, manufacturing and R & D roles with Tier 1 suppliers of advanced battery systems, engineered latching systems and power liftgate systems. He was responsible for the North American development and launch of the sodium sulfur battery system for the Ford Ecostar. Mr. Spek has worked with and led international teams in the design, development and launch phases. He is a member of SAE and is a Certified Manufacturing Engineer with SME. Mr. Spek received a M.A.Sc in Mechanical Engineering from the University of Waterloo and is a registered professional engineer in Ontario.

John C. Steiner
Mr. Steiner is a Senior Automotive Engineer with KEVA Engineering, LLC. Since 1999, Mr. Steiner has been engaged full time in the analysis and reconstruction of passenger and commercial vehicle crashes. His research interests have led to his involvement in the forefront of Event Data Recorders (EDR) and accident reconstruction technologies and methodologies. Mr. Steiner is an active, participating member of SAE International, the International Standards Organization (ISO), and the Association for the Advancement of Automotive Medicine (AAAM). He is Co-Chairman of the SAE J2728 Heavy Vehicle Event Data Recorder Truck & Bus Sub-Committee, which is an active Sub-Committee working to publish a Recommended Practice outlining the technical functions of an HVEDR. Mr. Steiner received his Bachelors of Science in Mechanical Engineering from California State University, Long Beach.

John Stolter
Mr. John Stolter is an independent consultant specializing in the design and delivery of technical and leadership skills training. He has developed and delivered training on over a dozen different sheet metal stamping topics and has led teams establishing formability laboratories for major automotive stamping plants. He is an effective, experienced instructor for many courses dealing with product design and manufacturing, including reading engineering drawings, GD&T, tolerance stack-up analysis, design for manufacturability, sheet metal formability, and FMEA. He has been instructing GD&T courses and consulting on the proper application of Y14.5M for more than 15 years. Mr. Stolter combines manufacturing and design experience with the ability to explain the role dimensioning and tolerancing plays in the product development process. Mr. Stolter’s in-depth knowledge of the topics, and his experienced, interactive teaching style result in classes that have very high levels of student satisfaction. He is certified by the American Society of Mechanical Engineers as a Senior Level GD&T Professional and holds a B.S. in Electrical Engineering from Wayne State University.

Alan D. Stuart
Alan D. Stuart, Ph.D., Lead Instructor, is an Associate professor emeritus of acoustics at Penn State. For over 25 years, he taught fundamentals of acoustics courses on both the graduate and undergraduate levels, as well as graduate courses on structural acoustics and applied acoustics. He has conducted numerous professional short courses on acoustics and vibrations and noise control engineering. At Penn State, he was the coordinator of the Summer Program in Acoustics and the Distance Education Program in Acoustics and received numerous awards for his contributions to Continuing and Distance Education. He is an active member of SAE, ASA, INCE and ASEE. Dr. Stuart received a B.S.M.E from Pratt Institute, an M.S.EE from New York University, and a Ph.D. in Engineering Acoustics from Penn State.
Xiaojian Tao
Dr. Xiaojian Tao is Manager of Advanced Fuel Delivery and Contamination Research at the Southwest Research Institute (SwRI). His work primarily focuses on automotive fuel delivery systems and system contamination sensitivity. Dr. Tao has conducted extensive testing and research on fuel and component compatibility for OEM auto-makers and also assisted in developing key life testing procedures for fuel pumps, fuel delivery modules and many other associated components. With the help of his staff, he developed a prototype electronic controlled variable valve lifting mechanism and a fast acting fuel injection system for flexible fuels.

Dr. Tao has assisted the automobile industry in revising existing fuel delivery procedures and establishing new ones. He has also successfully established mathematical models for these fuel delivery systems using nonlinear stochastic system theory. He then utilized these models to investigate the physics essentials of the interactions among contaminants, additive packages, fuels and fuel delivery system components. Dr. Tao has authored and co-authored numerous technical publications in related fields. He is a graduate of the Mechanical and Aerospace Engineering Department at Oklahoma State University.

Deborah D. Thompson
Dr. Thompson has over 25 years of industry, teaching and research experience, both in the product design/development and manufacturing areas. She received her Ph.D. in Industrial and Operations Engineering from the University of Michigan and is a Certified Professional Ergonomist (CPE). Currently, she is a project manager assigned to Army Programs in the Armament Systems Division of BAE Systems, involved in the development and implementation of engineering processes to accomplish human factors/MANPRINT responsibilities directed toward optimizing soldier performance and soldier-machine interactions to maximize battlefield effectiveness. Prior to joining BAE Systems, Dr. Thompson was the president and founder of an engineering consulting and training firm specializing in systems management and technology integration, with clients including Hyundai Motor Company, Dassault Systems, and Lear Corporation. Also, she has held engineering positions at DaimlerChrysler Corporation, and has held adjunct faculty positions at The University of Michigan, and the College for Creative Studies.

Helmut Tschoeke
Helmut Tschoeke is Professor and Head of the Chair of Reciprocating Machines at the Institute of Mobile Systems at the University of Magdeburg. From 1981 to 1995, he worked with Bosch Diesel Division where he was responsible for research, development and production of distributor and inline pumps, both mechanical and electronically controlled. Dr. Tschoeke also developed distributor-type pumps specifically for DI-engines and did research and development on the solenoid controlled rotary pump VP44. During his career he held positions as department head, chief engineer, and executive plant manager. He is an active member of VDI and IEEE. He has organized and presented at numerous SAE BOS and Powertrain Controls technical meetings. Mr. Van Gilder has a B.S.E. in Engineering Physics from the University of Michigan, a M.S.E. in Nuclear Engineering from the Bettis Atomic Power Laboratory and a M.S.E. in Reliability Engineering from Kettering University and is a Professional Engineer in the state of Michigan.

E. Harold Vannoy
Mr. Vannoy currently operates a consulting business specializing in product design assurance, process design assurance and reliability engineering. He earned a B.S. and M.S. in Electrical Engineering from the Univ. of Missouri-Rolla; studied probability and statistics at Purdue Univ.; and studied reliability engineering at the Univ. of Arizona. He is a Registered Professional Engineer in the state of Indiana, a Certified Reliability Engineer and a member of Eta Kappa Nu. He is also a member of SAE, SRE, IEEE, and ASQ. Mr. Vannoy was inducted into the Univ. of Missouri-Rolla Academy of Electrical Engineering for his contributions to the reliability of automotive electrical and electronic systems. He began his career with General Motors Delco Electronics Div., establishing a product assurance group for computer systems. From there he served as supervisor of reliability and service activities at GM Emission Control System Center; supervisor of electrical and electronic groups in the Reliability Engrg. Dept. of Cadillac Motor Car Div.; and as Mgr. of Product Assurance at AC Spark Plug Div. While at AC Spark Plug Div., he established an on-site master’s degree program in reliability engineering. Mr. Vannoy has presented papers at ASQ, IEEE, GM Product Engineering Technical Conf., Penn State Univ. Quality Assurance Seminar Series, Reliability and Maintainability Symposium, SRE, Univ. of Arizona Reliability Engrg. Management Inst., the Univ. of Arizona Reliability Testing Inst. and SAE. He has also given presentations abroad for several corporations. He serves on the SAE Reliability Comm. and has established reliability engineering courses with several universities.

James Walker, Jr.
James Walker, Jr. is currently a Principal Engineer specializing in chassis, brake, and electronic brake control systems at Carr Engineering, Inc. His prior professional experience includes brake
control system development, design, release, and application engineering at Kelsey-Hayes, Saturn Corporation, General Motors, Bosch, Ford Motor Company, and Delphi. Mr. Walker created scR motorsports consulting in 1997, and subsequently competed in seven years of SCCA Club Racing in the Showroom Stock and Improved Touring categories. Through scR motorsports, he has been actively serving as an industry advisor to Kettering University in the fields of brake system design and brake control systems. Since 2001, he has served as a brake control system consultant for StopTech, a manufacturer of high-performance racing brake systems. In addition to providing freelance material to multiple automotive publications focusing on chassis and brake technology, Mr. Walker is the author of the book, High-Performance Brake Systems: Design, Selection, and Installation. In 2005, he was presented with the SAE Forest R. McFarland Award for distinction in professional development and education and in 2010 he was awarded the SAE Master Instructor designation. He obtained his B.S.M.E. in 1994 from GMI Engineering & Management Institute.

Joseph D. Walter
Dr. Joseph D. Walter is presently on the faculty of The University of Akron’s College of Engineering as an adjunct professor where he teaches graduate and undergraduate courses in both the Mechanical and Civil Engineering Departments. Prior to joining academia, Dr. Walter was managing director of Bridgestone-Firestone’s Technical Center Europe located in located in Rome, Italy, and served on the Board of Directors of Bridgestone-Firestone Europe located in Brussels, Belgium. He has served as a mechanical engineering evaluator for the Accreditation Board for Engineering and Technology, ABET, and has also served on the original Committee of the National Academy of Sciences that addressed the future fuel economy (CAFE) goals for the nation, which is detailed in the 1992 book: Automotive Fuel Economy-How Far Should We Go? Dr. Walter received his Ph.D. from Virginia Tech and an MBA from The University of Akron. He is a member of several professional organizations, including SAE and the Rubber Division of the American Chemical Society.

Richard Walter
Richard Walter is the President and Founder of HEM Data Corporation. A pioneer in PC-based data acquisition and analysis, he has acquired data from in-vehicle networks since they were mandated in 1995. Mr. Walter previously worked at the Bendix Research Laboratories where he was awarded five patents for automotive inventions and gained valuable testing experience. He taught at Lawrence Technological University and has conducted numerous seminars and training sessions. He has had several articles and papers published in engineering journals including SAE and Sensors Magazine. Mr. Walter is a member of SAE, ASME and The Vibration Institute and is a registered professional engineer in Michigan. Mr. Walter has a B.S. in mechanical engineering from the University of Detroit, an M.S. in mechanical engineering from Wayne State University and an M.E.M. in engineering management from the University of Detroit.

Wego Wang
Dr. Wego Wang was educated at Massachusetts Institute of Technology, and earned his Doctorate of Science (Sc.D.) in metallurgy. He has been a technical instructor and a researcher in engineering alloys for more than twenty years. Dr. Wang taught at Northeastern Univ. and was a visiting lecturer at Boston Univ. and is currently an adjunct faculty at the Univ. of Massachusetts Lowell. Wego served at the Materials Directorate for the Army Research Laboratory and received seven awards and commendations. He is currently employed by the FAA. Dr. Wang authored or co-authored over 40 technical/professional articles, and presented lectures/reports at numerous seminars/conferences. He is active with professional societies and served on the executive committee of TMS Boston Section, where he was president from 1993-95.

Jack Williams
Mr. Williams is the principal at Airflow & Aerodynamics Engineering, LLC, an independent consultant specializing in the design and development of thermal management systems and vehicle aerodynamics. He is an adjunct faculty member at the Lawrence Technological University (LTU) and a guest lecturer for their MSAE Program on Automotive Mechanical Systems. In addition to his consulting work, he conducts professional development seminars for engineers on cooling systems, HEV battery thermal management, and road vehicle aerodynamics. Mr. Williams has over thirty years engineering management experience in product development at Ford Motor Co. Additionally, he was an aerodynamics project leader with the USAF Aeronautical Systems Division at Wright-Patterson Air Force Base, Ohio where he specialized in engine/aircraft integration, gas turbine engine performance, inlet design, and aircraft mission analysis. An active member of the SAE, Mr. Williams has authored over twenty technical papers, given invited lectures at major mid-west universities, and has received professional awards and international recognition for his innovative work. He is a recipient of two Henry Ford II Technology Awards, the SAE Industrial Lectureship Award, the SAE Oral Presentation Award, and the SAE Forest R. McFarland Award. He holds a B.S. in Aeronautical Engineering from the University of Detroit and an M.S. in Aerospace/Mechanical Engineering from the United States Air Force Institute of Technology.

Mark Wine
Mark Wine is a senior development engineer at Drew Technologies Inc. which is a manufacturer of J2534-1 devices. His work includes developing and supporting the J2534-1 compliant CardDAQ and Mongoose family of products. Mr. Wine has over 25 years of experience in product and software development including 10 years developing vehicle communication products. Most recently, Mr. Wine has been working with GM and Allison Transmission on advanced J2534-1 applications. Prior to working in automotive, Mr. Wine delivered product training and technical support throughout Asia. He has a B.S. in Electrical Engineering from Montana State University.

Katherine Whittington
Katherine Whittington is a Staff Engineer in the Electrical Parts Engineering organization at the Jet Propulsion Laboratory. She works as an analog parts specialist, and has been teaching a counterfeit parts awareness class at JPL since 2008. She has been a member of JPL’s Counterfeit Parts Working Group (CPWG) since 2007. She holds a B.S. in Physics from UC Berkeley. She has extensive flight experience and holds an Airline Transport Pilot certificate.

Sean Wu
Dr. Wu is currently a Distinguished Professor in the Department of Mechanical Engineering at Wayne State University where his primary areas of interest are acoustics, vibration, and noise control. He is credited for developing now widely recognized HELS (Helmholtz equation least squares) method for visualizing acoustic radiation from an arbitrarily vibrating structure, and an alternate integral formulation for predicting acoustic radiation from arbitrary objects. Dr. Wu holds eleven U.S. patents and has received numerous awards. He is an Associate Editor for the Journal of the Acoustical Society of America (JASA) and Editor of the Journal of Computational Acoustics. Dr. Wu is a Fellow of the American Society of Mechanical Engineers (ASME), a Fellow of the Acoustical Society of America (ASA) and is a member of SAE International and the Institute of Noise Control Engineering (INCE). Dr. Wu received a B.S.M.E. from Zhejiang University, China, and M.S.M.E. and Ph.D. degrees from Georgia Institute of Technology.
Instructor Biographies

Mark Zachos
Mark Zachos is currently an adjunct professor at the University of Michigan. He is the President of Dearborn Group, Inc. and has more than twenty years of networking experience. Mr. Zachos participates in many SAE and ISO multiplexing committees, including the following: J1850, J1939, J2284, J2411, and J2367. He holds a B.S. and an M.S. in engineering from the University of Michigan.

Kevin Zielinski
Kevin Zielinski currently owns and operates Red Cedar Media LLC, a training and corporate communications consulting, design, development and delivery company based in Michigan. Previously, Kevin was Senior Applications Specialist for EDS (including General Motors/EDS and Hewlett Packard/EDS) specializing in technical training delivery, training consulting, courseware design and development, and e-Learning. He has designed, developed and delivered over 40 lecture- and web-based courses attended by General Motors and EDS employees worldwide. Mr. Zielinski has also served as Adjunct Professor for the Wayne State University College of Engineering and WSU/Focus: Hope for many years. His areas of expertise include: e-Learning design and development, Quality Tools and Methods (Design of Six Sigma, Robust Engineering, Design of Experiments (DOE), Statistical Tolerancing and GD&T), Design for Manufacturing and Assembly (DFMA), Engineering Economics, and Plant Floor Throughput Improvement. He has been an instructor for SAE Professional Development since 1990, and is a recipient of SAE’s Forest R. McFarland Award (April 2005). He holds a bachelor’s and master’s degree in engineering from Wayne State University.

Phil Zulueta
Phil Zulueta manages the Hardware Technology Assurance Group at the Jet Propulsion Laboratory, where he leads a team of engineers and technologists involved in Electronics Packaging Assurance Technologies, Non-destructive Evaluation, Electronics Manufacturing Technology Transfer (Training) and Certification, Electronics Inspection, Optical Metrology and Electro-Static Discharge (ESD) Awareness and Control. He is a JPL Program Element Manager for the NASA Electronic Parts and Packaging (NEPP) Program, facilitates the Counterfeit Parts Working Group meetings at JPL and Chairs the SAE G-19 Counterfeit Electronic Parts Committee. He is also a Past-President of the International Microelectronics and Packaging Society (IMAPS). Prior to joining JPL, he was Western Regional Manager for Electro-Science Laboratories, a Program Manager for Ball Aerospace, an Engineering Group Manager for Hughes Microelectronics in Newport Beach, CA and a Microelectronics Process Engineer for Northrop Electronics. His education includes an MBA from Pepperdine University and a B.S. in Materials Engineering from California State University Long Beach.

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• World in Motion Classroom Volunteers (K-12 education)
• SAE Volunteer Executive Leadership

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Jan 10-11  Diesel Engine Technology - I.D.#93014
Jan 13-14  Advanced High Strength Steels for Vehicle Weight Reduction - I.D.#C0916
Jan 17-19  Chassis & Suspension Component Design for Passenger Cars & Light Trucks - I.D.#95025
Jan 20-21  Product Liability & The Engineer - I.D.#52001
Jan 24-26  Sheet Metal Stamping: Robust Formability - I.D.#C0713
Jan 27-28  Acquiring and Analyzing Data from Sensors and In-Vehicle Networks - I.D.#C0522
Jan 31-Feb 1  Selective Catalytic Reduction for Diesel Engines - I.D.#C0913

Webinar - via telephone/internet

Jan 11-13  Variable Compression Ratio (VCR) Webinar - I.D.#WB1012
Jan 17-21  Homogeneous Charge Compression Ignition (HCCI) Webinar - I.D.#WB1013
Jan 18 - Feb 3  Design of Experiments (DOE) for Engineers Webinar - I.D.#WB0852
Jan 31 - Feb 4  Design FMEA Update: What's New in J1739 Webinar - I.D.#WB0955

Warrendale, PA - SAE World Headquarters

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Troy, MI - SAE Automotive Headquarters

Feb 3-4  Program and Risk Management - I.D.#C0409
Feb 7-8  Introduction to Commercial and Off-Road Vehicle Cooling Airflow Systems - I.D.#C0738
Feb 9-11  Designing On-Board Diagnostics for Light and Medium Duty Emissions Control Systems - I.D.#C0707
Feb 9-11  Strategic Leadership - I.D.#C0620
Feb 14-15  Side Impact Occupant Safety and CAE - I.D.#C717
Feb 21-23  Fundamentals of Modern Vehicle Transmissions - I.D.#99018
Feb 24  Introduction to Gears - I.D.#C0822
Feb 28-Mar 1  Modern Fluids for Crankcase Engines: An Overview - I.D.#C0704
Feb 28-Mar 2  Combustion & Emissions for Engineers - I.D.#C97011

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Feb 15  Introduction to Hybrid Powertrains Webinar - I.D.#C0903
Feb 17  Basic Hybrid and Electric Vehicle Safety Webinar - I.D.#C0904
Feb 22  Plug-in Hybrids: Opportunities and Challenges Webinar - I.D.#C0905
Feb 24  Hybrid and Electric Vehicles: Current Production, Future Strategies Webinar - I.D.#C0906

Warrendale, PA - SAE World Headquarters

Feb 14-17  IAGG Sanctioned Aerospace Auditor Transition Training (AATT) - I.D.#C1034

Troy, MI - SAE Automotive Headquarters

Mar 3-4  Vehicle Frontal Crash Occupant Safety and CAE - I.D.#C0621
Mar 7-8  Accelerated Test Methods for Ground and Aerospace Vehicle Development - I.D.#C0316
Mar 7-8  The Basics of Internal Combustion Engines - I.D.#C0103
Mar 14-15  Automotive Powertrain and Battery Cooling Airflow Systems: A Vehicle Perspective - I.D.#C0616
Mar 17-18  In-Vehicle Networking with LIN and FlexRay Applications - I.D.#C0316
Mar 21-22  Evaporative and Refueling Emission Control - I.D.#C0928
Mar 23-25  Turbocharging Internal Combustion Engines - I.D.#C0314
Mar 23-25  Vehicle Dynamics for Passenger Cars and Light Trucks - I.D.#C99020

Webinar - via telephone/internet

Mar 1-24  Fundamentals of Geometric Dimensioning & Tolerancing (GD&T) Webinar - I.D.#WB0933
Mar 29-31  Powertrain Control Unit/Transmission Control Unit Technology Webinar - I.D.#WB1001

Warrendale, PA - SAE World Headquarters

Mar 28-31  IAGG Sanctioned Aerospace Auditor Transition Training (AATT) - I.D.#C1034

Detroit, MI - Detroit Marriott at the Renaissance Center

Apr 11  Emissions-Related OBD Systems: A Design Overview - I.D.#C0708
Apr 11  Fundamentals ofShielding Design for EMC Compliance - I.D.#C0835
Apr 11  Design Reviews for Effective Product Development - I.D.#C0004
Apr 11  A Familiarization of DriveTrain Components - I.D.#C98024
Apr 11  Brake Friction Materials: Testing, Quality and Selection - I.D.#C1020
Apr 11  Patent Law for Engineers - I.D.#C88007
Apr 11  Common Rail Diesel Fuel Injection - I.D.#C0920
Apr 11-12  The Role of the Expert Witness in Product Liability Litigation - I.D.#C20054
Apr 11-12  Threaded Fasteners and the Bolted Joint - I.D.#C95030
Apr 11-12  Improving Fuel Efficiency with Engine Oils - I.D.#C9014
Apr 11-12  Diesel Emissions and Control Technologies - I.D.#C206
Apr 11-13  Weibull-Log Normal Analysis Workshop - I.D.#C8634
Apr 11-13  Fundamentals of Heavy Truck Dynamics - I.D.#C0837
Apr 11-13  Gasoline Direct Injection (GDI) Engines - I.D.#C1009
Apr 12  Fundamentals of All-Wheel Drive Systems - I.D.#C0305
Apr 12  Catalytic Converters: Design and Durability - I.D.#C98017
Apr 13-15  Injuries, Anatomy, Biomechanics & Federal Regulation - I.D.#C85049
Apr 13-15  Electrohydraulic Controls for Mobile Equipment & Vehicles - I.D.#C1011
Apr 13-15  Fundamentals of Metal Fatigue Analysis - I.D.#C4024
Apr 13-15  Principles of Cost and Finance for Engineers - I.D.#C0821
Apr 14  The Tire as a Vehicle Component - I.D.#C0101
Apr 14  Metal Corrosion and Its Prevention - I.D.#C99006
Apr 14-15  Tolerance Stack-Up Analysis - I.D.#C0222
Apr 14-15  Homogeneous Charge Compression Ignition Engines - I.D.#C1010
Apr 14-15  Engineering Project Management - I.D.#C9903
Apr 14-15  Leading High Performance Teams - I.D.#C0410
Apr 15  Tire & Wheel Safety Issues - I.D.#C9702

Troy, MI - SAE Automotive Headquarters

Apr 4-11  Vibration Analysis using FE,A: A Hands-on Workshop - I.D.#C830
Apr 26-27  Control Systems Simplified - I.D.#C0525
Apr 27-28  Introduction to Hydraulic Hybrid Systems for Road Vehicles - I.D.#C0835
Apr 27-29  Internal Combustion Systems: HCCI, DoD, VCT/VT, DI and VCR - I.D.#C0613
Apr 29  Understanding and Using the SAE J2534-1 API to Access Vehicle Networks - I.D.#C0735

Webinar - via telephone/internet

Apr 4-8  Review of AMT and DCT Technology Applied to Automotive Powertrain Webinar - I.D.#WB1003
Apr 19-21  Fundamentals of Continuously Variable Transmission Technology Webinar - I.D.#WB1002
Apr 26-May 5  Principles of Electric Drives Webinar - I.D.#WB0941

Grand Rapids, MI - DeVos Place Convention Center

May 16  Basic Noise Control - I.D.#C0628
May 16-17  Practical NVH Signal Processing Methods - I.D.#C0431
May 19  Brake Noise Problem Resolution - I.D.#C0831

Greer, SC - BMW Performance Center

May 2-4  Applied Vehicle Dynamics - I.D.#C0414

Troy, MI - SAE Automotive Headquarters

May 2-3  A Holistic Introduction to Commercial Telematics - I.D.#C0947
May 2-3  Introduction to FMEA for Product Design & Manufacturing Process Design - I.D.#C09002
May 2-3  Diesel Engine Technology - I.D.#C93014
May 4-5  Mechatronics: Introduction, Modeling and Simulation - I.D.#C094
May 9-10  Design of Experiments for Engineers - I.D.#C0406
May 9-10  Introduction to Hybrid and Electric Vehicle Battery Systems - I.D.#C0833
May 9-10  Fundamentals of Commercial Vehicle Aerodynamics - I.D.#C0919
May 11  Safe Handling of High Voltage Battery Systems - I.D.#C1019
May 16-17  Powertrain Selection for Fuel Economy and Acceleration Performance - I.D.#C2043
May 16-17  Piston Ring Design/Materials - I.D.#C06009
May 16-18  Advanced Vehicle Dynamics for Passenger Cars and Light Trucks - I.D.#C0415
May 19-20  Embedded Control Systems Design Workshop - I.D.#C0922
May 23-24  Finite Element Analysis for Design Engineers-Hands-On FEA Workshop - I.D.#C0306
May 25  Statistical Tolerance Design - I.D.#C88033
Webinar - via telephone/internet
May 10-19 Root Cause Problem Solving: Methods and Tools Webinar - I.D.#WB0931

Troy, MI - SAE Automotive Headquarters
Jun 6-10 Diesel Engine Technology Engineering Academy - I.D.#ACAD03
Jun 8-10 Hydraulic Brake Systems for Passenger Cars & Light Trucks - I.D.#C0509
Jun 16-17 Fundamentals of Steering Systems - I.D.#C0716
Jun 20-21 Selective Catalytic Reduction for Diesel Engines - I.D.#C0913
Jun 20-22 Geometric Dimensioning & Tolerancing - I.D.#C0033
Jun 22-24 Commercial Vehicle Braking Systems - I.D.#C0233
Jun 23-24 Acquiring and Analyzing Data from Sensors and In-Vehicle Networks - I.D.#C0522
Jun 27-28 Advanced High Strength Steels for Vehicle Weight Reduction - I.D.#C0916
Jun 27-29 Chassis & Suspension Component Design for Passenger Cars & Light Trucks - I.D.#C0505

Webinar - via telephone/internet
Jun 14-16 Displacement on Demand Systems (DoD) Webinar - I.D.#WB1010
Jun 20-24 Variable Cam and Valve Timing (VCT) & (VVT) Webinar - I.D.#WB1011

Troy, MI - SAE Automotive Headquarters
Jul 11-13 Introduction to Metallurgy and Its Practice - I.D.#C0905
Jul 14-15 Sheet Metal Stamping: Robust Formability - I.D.#C0713
Jul 18-20 Fundamentals of Heavy Truck Dynamics - I.D.#C0837
Jul 18-20 Combustion & Emissions for Engineers - I.D.#C0701
Jul 21-22 Product Liability & The Engineer - I.D.#C0200
Jul 25-27 Designing On-Board Diagnostics for Light and Medium Duty Emissions Control Systems - I.D.#C0707
Jul 28 Exhaust Flow Performance and Pressure Drop of Exhaust Components and Systems - I.D.#C0235

Webinar - via telephone/internet
Jul 12-14 Variable Compression Ratio (VCR) Webinar - I.D.#WB1012
Jul 18-22 Homogeneous Charge Compression Ignition (HCCI) Webinar - I.D.#WB1013
Jul 26-28 Introduction to Hybrid Powertrains Webinar - I.D.#C0903
Jul 28-28 Basic Hybrid and Electric Vehicle Safety Webinar - I.D.#C0904

Troy, MI - SAE Automotive Headquarters
Aug 1-3 Fundamentals of Metal Fatigue Analysis - I.D.#C0424
Aug 3-5 Electrohydraulic Controls for Mobile Equipment & Vehicles - I.D.#C1011
Aug 4-5 Threaded Fasteners and the Bolted Joint - I.D.#C0930
Aug 8-9 Modern Fluids for Crankcase Engines: An Overview - I.D.#C0704
Aug 10-12 Vehicle Dynamics for Passenger Cars and Light Trucks - I.D.#C0820
Aug 15-17 Fundamentals of Modern Vehicle Transmissions - I.D.#C0918
Aug 18 Introduction to Gears - I.D.#C0822
Aug 18-19 Evaporative and Refueling Emission Control - I.D.#C0928
Aug 22-24 Gasoline Direct Injection (GDI) Engines - I.D.#C1009
Aug 22-24 Geometric Dimensioning & Tolerancing - I.D.#C0620
Aug 25-26 Side Impact Occupant Safety and CAE - I.D.#C0717
Aug 29-30 Improving Fuel Efficiency with Engine Oils - I.D.#C0914
Aug 29-31 Turbocharging Internal Combustion Engines - I.D.#C0314

Webinar - via telephone/internet
Aug 21-22 Tolerance Stack-up Fundamentals Webinar - I.D.#C0842
Aug 3 Plug-in Hybrids: Opportunities and Challenges Webinar - I.D.#C0095
Aug 5 Hybrid and Electric Vehicles: Current Production, Future Strategies Webinar - I.D.#C0906

New Orleans, LA - New Orleans Marriott
Sep 22 Brake Friction Materials: Testing, Quality and Selection - I.D.#C1020

Rosemont, IL - Donald E. Stephens Convention Center
Sep 12 Introduction to Hydraulic Hybrid Systems for Road Vehicles - I.D.#C0833
Sep 12-13 Homogeneous Charge Compression Ignition Engines - I.D.#C1010
Sep 12-13 Introduction to Commercial and Off-Road Vehicle Cooling Airflow Systems - I.D.#C0738
Sep 12-13 Selective Catalytic Reduction for Diesel Engines - I.D.#C0913
Sep 14 Heavy Vehicle Ride Comfort Engineering - I.D.#C0948
Sep 14 Common Rail Diesel Fuel Injection - I.D.#C0920

Troy, MI - SAE Automotive Headquarters
Sep 12-13 Accelerated Test Methods for Ground and Aerospace Vehicle Development - I.D.#C0316
Sep 12-14 Motor Fuel Technology, Performance, Testing, and Specifications - I.D.#C0803
Sep 15-16 The Basics of Internal Combustion Engines - I.D.#C0103
Sep 19-21 Injuries, Anatomy, Biomechanics & Federal Regulation - I.D.#C0549
Sep 26-27 Controls, Actuator Area Network (CAN) for Vehicle Applications - I.D.#C0120
Sep 26-27 Vehicle Frontal Crash Occupant Safety and CAE - I.D.#C0621
Sep 29-30 Leading High Performance Teams - I.D.#C0410
Oct 3 Fundamentals of All-Wheel Drive Systems - I.D.#C0305
Oct 3 Patent Law for Engineers - I.D.#C0807
Oct 3-4 Introduction to Hybrid and Electric Vehicle Battery Systems - I.D.#C0625
Oct 5 Safe Handling of High Voltage Battery Systems - I.D.#C0191
Oct 5 Internal Combustion Systems: HCCI, DoD, VCT/VVT, DI and VCR - I.D.#C0813
Oct 7 A Familiarization of Driveetrain Components - I.D.#C0924
Oct 10-11 Diesel Engine Technology - I.D.#C0914
Oct 10-12 Advanced Vehicle Dynamics for Passenger Cars and Light Trucks - I.D.#C0415
Oct 12-14 Principles of Cost and Finance for Engineers - I.D.#C0828
Oct 13 The Tire as a Vehicle Component - I.D.#C0101
Oct 14 Tire & Wheel Safety Issues - I.D.#C0102
Oct 17-18 Catalytic Converters: Design and Durability - I.D.#C0807
Oct 17-19 Weibull-Log Normal Analysis Workshop - I.D.#C0834
Oct 19-21 Diesel Emissions and Control Technologies - I.D.#C0206
Oct 24-25 Design of Experiments for Engineers - I.D.#C0406
Oct 31-Nov 1 Fundamentals of Steering Systems - I.D.#C0716

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Oct 11-13 Powertrain Control Unit/ Transmission Control Unit Technology Webinar - I.D.#WB1001
Oct 17-21 Review of AMT and DCT Technology Applied to Automatic Powertrain Webinar - I.D.#WB1003
Oct 18-27 Principles of Electric Drives Webinar - I.D.#WB0941

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Nov 3-4 Powertrain Selection for Fuel Economy and Acceleration Performance - I.D.#C0243
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Nov 7-9 Metal Corrosion and Its Prevention - I.D.#C0906
Nov 10-11 Tolerance Stack-Up Analysis - I.D.#C0224
Nov 14-15 A Holistic Introduction to Commercial Telematics - I.D.#C0947
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Nov 21-22 Finite Element Analysis for Design Engineers-Hands-On FEA Workshop - I.D.#C0906
Nov 21-22 Practical NVH Signal Processing Methods - I.D.#C0431
Nov 28-30 Advanced Fundamentals of Metal Fatigue Analysis - I.D.#C0924
Nov 29-Dec 1 Hydraulic Brake Systems for Passenger Cars & Light Trucks - I.D.#C0509

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Nov 1-3 Fundamentals of Continuously Variable Transmission Technology Webinar - I.D.#WB1001
Nov 9-18 Root Cause Problem Solving: Methods and Tools Webinar - I.D.#WB0931

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Dec 1-2 Threaded Fasteners and the Bolted Joint - I.D.#C0530
Dec 2 Brake Noise Problem Resolution - I.D.#C0831
Dec 5-7 Fundamentals of Heavy Truck Dynamics - I.D.#C0837
Dec 7-9 Geometric Dimensioning & Tolerancing - I.D.#C0133
Dec 12-14 Commercial Vehicle Braking Systems - I.D.#C0233
Dec 14-16 Electrohydraulic Controls for Mobile Equipment & Vehicles - I.D.#C0904
Dec 15-16 Homogeneous Charge Compression Ignition Engines - I.D.#C1010

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