EVENT OVERVIEW

The SAE Noise and Vibration Forum is taking its premier technical program to Shanghai, China. This year’s forum is SAE International’s first noise and vibration event in the APAC region, and expects to bring value to attendees by hosting experts from the U.S., Europe, and China. This event’s technical presentations, professional development offerings, and networking between experts and attendees provides a vital exchange of critical information on this highly technical topic.

Get the latest updates on industry standards and government regulations in both noise and vibration harshness, especially targeted at issues for the New Energy Vehicles. The valuable knowledge obtained from the technical presentations will help engineers and their companies meet and exceed customer satisfaction, product and structural integrity, and compliance with legislation.

This event will also be co-located with SAE’s New Energy Vehicle Forum that will allow for a larger networking pool and a more robust listing of exhibitors.

HOST

SAE International
08:45 - 10:30  
**Welcome and Introductions**  
SAE International  

**Keynotes Presentations - Trends in Noise and Vibration Engineering**  
**NVH and Attributes balancing on Electrical Vehicles**  
Alexandre Nunes, Associate Director - NIO  

**The Importance of Tire/Road Noise Mitigation for Electric Vehicles**  
Greg Goetchius, Engineering Manager, NVH - Lucid Motors  

**Challenges and Opportunities for NVH Performance Development in Electric Vehicles**  
Jennifer Goforth, Chief Engineer, China Electrification - GM  

10:30 - 11:00  
**Tea Break**  

11:00 - 12:30  
**Road Noise NVH Considerations for Hybrid and Electric Vehicles**  
This session discusses the road noise control strategy, and NVH technology unique to New Energy Vehicles. It is intended to bring a greater awareness of the NVH characteristics of these new vehicles to all NVH practitioners. At the same time, it will provide a forum to discuss the new demands for test facilities, testing, design, content, as well as safety benefits and environmental consequences of minimum sound regulatory requirements.  

Zhiming LUO, Systems Engineering Manager, Aerospace & Defense - 3M  
Jian PAN, Director System Development, Product Testing and Simulation - Autoneum  
Greg CHEN, Sr. Chief Engineer - Geely  

12:30 - 13:30  
**Lunch & Networking Break**  

13:30 - 14:30  
**Road Noise NVH Considerations for Hybrid and Electric Vehicles (Continued)**  
**Interior Noise Contribution Analysis of New Energy Vehicle Based on SEA Modeling**  
Dr. Wei HUANG, Deputy General Manager - Gisseng Tech  
Robert Powell, Director, Structural Acoustics - EXA  

14:30 - 15:30  
**Electronic Control Systems NVH**  
This session is presenting both numerical and experimental work pertaining to noise caused by electronic control systems, such as inverters, power converters, cabling, sensors.  

Jacky Gu, Delphi  
AVX (Invited)  

15:30 - 16:00  
**Tea Break**  

16:00 - 17:00  
**Transmissions and Driveline Noise from Electric Drive Systems**  
This session deals with analytical, computational and experimental studies of the dynamic response including noise and vibration of electric driveline system and components. Typical topics of interests include, but not limited to, electric motors, gearboxes, batteries, and generators.  

**Systems Engineering approach for NVH development of Electric Drivelines**  
Haitao Gao, NVH Engineer - ZF  

**Strategy of Road Noise Control for Hybrid and Electric Vehicles**  
Jian Pang, VP and Chief Engineer - Changan Auto Global R&D Center  
AVL
VENUE INFORMATION

Crowne Plaza Shanghai Anting Golf

Address: No.6555 BoYuan Road, JiaDing District, Shanghai, China
Phone: +86-21-6056-8888

Registration & Exhibit & Sponsorship Contact (China):
Yasmine Miao
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Exhibit & Sponsorship Contact (Global):
Ms. Megan McCoy
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Registration Fee: CNY 2,000 (Only Noise and Vibration Forum)

Co-location Event
New Energy Vehicle Forum (September 11-12)
Register 2 Events (September 11-13)

Registration Fee: CNY 3,200
Registration Fee: CNY 4,000

More Information and Registration, Please Visit:
www.sae.org/attend/noise-and-vibration-forum
OVERVIEW

The sound package materials for vehicle noise control seminar provides a detail and thorough analysis of three different classes of acoustical materials – namely absorbers, barriers, and dampers, how they are different from each other, and acoustical properties that materials should possess for optimum vehicle noise control. The seminar addresses new advances in acoustical materials, primarily in absorption materials that impact the vehicle acoustics. The seminar covers ways to evaluate the acoustical performance of these materials using different test methods, including material, component, and vehicle level measurements. The two day seminar starts with the fundamentals of NVH and sound quality related to sound package materials and discusses the importance of various noise sources that impact the development of sound package treatments in a vehicle.

OBJECTIVES

By attending this training program you will be able to:

- Identify various descriptors that are used in NVH and sound quality while working with sound package materials
- Recognize various noise sources and paths in a vehicle
- Identify three different classes of acoustical materials
- Describe ways that acoustical materials work and how they differ from each other
- Road map for vehicle sound package development
- Distinguish test methods used to evaluate the acoustical performance of material

WHO SHOULD ATTEND

Designed for OEM or supplier employees responsible for various noise activities, such as design, evaluation, trouble-shooting, procuring, supplying, and/or manufacturing noise control treatments and parts, this seminar will also benefit those with responsibilities including the areas of manufacturing, design, engineering, process, noise and release engineering, supervision or management. Attendees should have an undergraduate engineering degree and/or a working knowledge of noise control and automotive acoustics.

OUTLINE

DAY ONE

- Fundamentals of NVH and Sound Quality
  - Defining acoustical performance of acoustical parts
  - Definition of terms
  - Human response to sound
  - Various noise and vibration instrumentation
- Vehicles Noise Sources and Solutions
  - The noise system
  - Vehicle noise sources
  - Road and wind noise
  - Miscellaneous noise sources
  - Noise control solution - source, path, receiver
  - Noise control system using sound package materials

DAY TWO

- Materials for Vehicle Noise Control
  - Absorber, including case studies and test methods
  - Barrier, including case studies and test methods and the effect of holes
  - Damper, including case studies and test methods
  - Isolator
- Different Automotive Measurements
  - Vehicle
  - Component
  - Material
INSTRUCTOR: Pranab Saha

Pranab Saha 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 and training seminars for various OEMs and suppliers in India, Mexico, and USA. Dr. Saha is currently the Chair of the SAE Engineering Meetings Board, a Professional Development Instructor, and the Lead Faculty Member of the SAE Vehicle Interior Noise Academy. He is also the past-chairman of the SAE Acoustical Materials Committee and has helped develop several standards in acoustics. Dr. Saha is an active member of ASA, ASME, ESD, INCE, NSPE, SAE International, and a contributing editor of Sound and Vibration publication. He has presented technical papers, organized and chaired numerous technical sessions sponsored by SAE and other professional organizations. Dr. Saha has also won several awards presented by the SAE International and the Michigan Society of Professional Engineers (MSPE) and has been named an SAE Master Instructor. Dr. Saha holds a B.S. in Mechanical Engineering from the University of Calcutta, a M.S. in Engineering Sciences from the University of Florida and a Ph.D. in Mechanical Engineering (Acoustics Specialty) from the Georgia Institute of Technology.
OVERVIEW

The course introduces the basic knowledge of vehicle noise and vibration, provides the analysis and control methods for noise and vibration sources, and transfer paths, and describes the occupants' responses and control.

The course is specially designed for NVH engineer and related graduate students. The course combines the NVH theory and engineering practices. After finishing the course, the students will deeply understand the mechanism of NVH and promote their capacity to solve engineering problems.

OBJECTIVES

By attending this training program you will be able to:

- Understanding the NVH knowledge for vehicle development
- Mastering the NVH knowledge for vehicle development and learning engineering experience
- Mastering the analysis and control methods of "Source-Transfer Path-Occupant" needed for vehicle NVH development

WHO SHOULD ATTEND

Vehicle NVH engineers/ Vehicle product development engineers/ Vehicle attribute integration engineers/ Graduate students in sound and vibration/ Engineering experience is not needed, but helpful, especially experience in NVH/ Bachelor degree in mechanical engineering or electrical engineering or related engineering disciplines. Engineering experience is not required, but helpful.

OUTLINE

DAY ONE

Part One: Introduction

- Problems and challenges of vehicle NVH
  - Problems of vehicle NVH

Part Two: Analysis and Control of Vehicle Noise and Vibration Sources

- Analysis and Control of Engine Noise and Vibration
  - Analysis of engine noise and vibration source
  - Combustion noise and mechanical noise
  - Structural vibration and sound radiation of engine
  - Vibration and noise of engine accessories

- Analysis and Control of Drivetrain Noise and Vibration
  - Vibration and control of driveline system
  - Whine and control of drivetrain system
  - Rattle and control of drivetrain system

- Analysis and Control of Intake and Exhaust Noise and Vibration
  - Evaluation of duct acoustic elements
  - Sound attenuation elements in intake and exhaust systems
  - Analysis and control of intake noise and vibration
  - Analysis and control of exhaust noise and vibration

- Wind Noise
  - Mechanism of wind noise
  - Types of wind noise
  - Overall body styling and wind noise
Part Three: Analysis and Control of Noise and Vibration Transfer Paths

- Analysis and Control of Engine Noise and Vibration
  - Analysis of engine noise and vibration source
  - Combustion noise and mechanical noise
  - Structural vibration and sound radiation of engine
  - Vibration and noise of engine accessories

- Analysis and Control of Drivetrain Noise and Vibration
  - Vibration and control of driveline system
  - Whine and control of drivetrain system
  - Rattle and control of drivetrain system

- Analysis and Control of Intake and Exhaust Noise and Vibration
  - Evaluation of duct acoustic elements
  - Sound attenuation elements in intake and exhaust systems
  - Analysis and control of intake noise and vibration
  - Analysis and control of exhaust noise and vibration

- Wind Noise
  - Mechanism of wind noise
  - Types of wind noise
  - Overall body styling and wind noise control
  - Local structure design and wind noise control
  - Measurement, analysis and evaluation of wind noise

Part Four: Human Response Analysis and Control

- Subjective Evaluation and Objective Evaluation
  - Perception characteristics of human body on sound and vibration
  - Subjective evaluation of vehicle noise and vibration
  - Objective testing of vehicle noise and vibration

- Automotive Sound Quality
  - Fundamental of sound quality
  - Powertrain sound quality
  - Door closure sound quality
  - Electrical sound quality

- Active Control of Vehicle Noise and Vibration
  - Active control
  - Semi-active control
INSTRUCTOR: Jian Pang, Ph.D.

Dr. Jian Pang is a vice president and chief engineer of Changan Auto Global R&D Centre (Chongqing, China) since 2008. He used to be a technical specialist in Stewart & Steven Service, Inc. (1997-1999, Houston, Texas) and a senior engineer in Ford Motor Company (1999-2008, Dearborn, Michigan).

He received his Ph.D. degree in mechanical engineering from the University of Oklahoma (Norman, Oklahoma, USA) in 1996. He received his BS (1985) and MS (1991) in mechanical engineering from Wuhan University of Technology (Wuhan, China) and Shanghai Jiao Tong University (Shanghai, China), respectively.

Dr. Pang has over 30 years experience in noise and vibration control engineering, especially in vehicle engineering. He published 4 technical books and 2 literature books. "Automotive Noise and Vibration - Principle and Application" (in Chinese) and "Vehicle Body Noise and Vibration Control" (in Chinese) are regarded as the most influence books in the NVH field in China. He is working on the English version of the book "Vehicle Body Noise and Vibration Control". He published over 70 papers on international and national journals and conferences.

He serves as the vice director of China National Key Lab of Vehicle NVH and Safety, the leader of OICA (Organisation Internationale des Constructeurs d'Automobiles) China Noise Group, vice chairman of China NVH society, guest professor of Tong Ji University and Chongqing University. He used to be the chairman of NVH Technical Committee of 2012 FISITA (World Automotive Engineer Congress).


Registration

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