Unrestricted

Hybrid and Electric vehicle NVH Masterclass

FEBRUARY 18-19-20 | AGENDA
SIEMENS DIGITAL INDUSTRIES SOFTWARE, INTERLEUVENLAAN 68, 3001 LEUVEN, BELGIUM

DAY 1: Tuesday February 18

As of 8:00 Registration

9:00 – 10:00 Welcome & Introduction
Electrification poses a range of new challenges to development teams in terms of design and development for vehicle architecture, battery and e-motor design, energy and thermal management, aerodynamics and NVH

10:00 – 11:00 Keynote: From e-motor to integrated e-drive systems - today’s experience and vision of future NVH performance
Dr. Yves Burkhardt of Valeo Siemens eAutomotive

11:00 – 11:15 Coffee break

11:15 – 12:00 Electric Vehicle Sound Quality Testing and Analysis
The differences between ICE vehicle and electric vehicle noise and how to use Sound Quality metrics in the context of EVs - demonstrations based on real cases

12:00 – 13:00 Lunch

13:00 – 14:00 Electric Vehicle Sound Quality Testing and Analysis – continued
The differences between ICE vehicle and electric vehicle noise and how to use Sound Quality metrics in the context of EVs - demonstrations based on real cases

14:00 – 14:45 Transfer Path Analysis as a fundamental tool for NVH analysis
Introduction to evaluating noise from the excitation source travels to a given receiver location

14:45 – 15:00 Coffee break

15:00 – 17:30 Transfer Path Analysis as a fundamental tool for NVH analysis
The preferred TPA methodology depends on the structure, single or multi-reference sources, and the stage of the development. Here we will discuss the application to road noise, component-based TPA and demonstrate it on a wiper motor

17:45 Bus transfer to hotel

19:00 Visit brewery Den Domus

20:00 Dinner

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DAY 2: Wednesday February 19

8:00    Bus transfer from hotel to masterclass venue

9:00 – 10:30  **Driveline NVH aspects – Electric motor noise analysis**
- The relationship between the electrics/electronics and the generated noise
- Electro-magnetic simulation as an input to acoustic simulation
- E-motor noise assessment at early concept phase

10:30 – 10:45  Coffee break

10:45 – 12:30  **Driveline NVH aspects – Transmission noise**
- Addressing gear whine and rattle
- How to increase productivity for predicting gear noise with time and frequency domain simulation models
- Process demonstration(s)

12:30 – 13:30  Lunch

13:30 – 15:00  **System Integration – Supporting technologies**
Model-based Design (MBD) and Model-based System Testing (MBST): how to combine 1D, 3D and Testing to balance NVH with drivability and energy management

15:00 – 15:15  Coffee break

15:15 – 17:15  **Demonstration on Chassis dyno and MBST test rigs**
Visit to the Siemens engineering hall, discussions and demonstrations in small groups

17:30    Bus transfer to hotel

19:00    Dinner in Grand Café De Hoorn
DAY 3: Thursday February 20

8:00  Bus transfer from hotel to masterclass venue

9:00 – 10:30  Flow induced noise
How to apply acoustic testing and aero-acoustic simulation to tackle flow-induced noise such as wind noise and HVAC noise

10:30 – 10:45  Coffee break

10:45 – 12:00  Body Engineering
- Body/Platform Development in view of electrification and weight reduction
- Target setting
- Stiffness Optimization
- Interior noise analysis

12:00 – 13:00  Lunch

13:00 – 14:00  Acoustic Vehicle Alerting System (AVAS) to design sound quality of an electric vehicle
- Active sound design for electric vehicle
- Interior and exterior applications
- Sound System Engineering

14:00 – 16:00  Vehicle demonstrations / Hands-on activities on chassis dyno
Interactive session with a fully instrumented electric vehicle on the chassis dyno

16:00 – 17:00  Q&A and conclusion

17:00  Closing

17:15  Transfer to railway station + Novotel Hotel