The road to zero physical prototypes for NVH development

Component-based Transfer Path Analysis and Virtual Prototyping

MASTER CLASS | November 18-20, 2025 | Leuven, Belgium

The Master Class in a nutshell

The Component-based TPA and Virtual Prototyping Master Class is a 3-day live training event that brings together the NVH community at the NVH facility in Leuven, Belgium. This immersive program features theoretical lectures and insights from industry leaders, supported by live demonstrations, interactive sessions, and more than 9 hours of hands-on workshops in small groups.

The master class offers a comprehensive learning experience, providing insights and best practices for transitioning from physical prototype troub leshooting to virtual prototype prediction.

Why attend?

Historically, NVH validation has relied on physical prototypes, but the growing number of vehicle variants has made this approach unsustainable within reasonable budgets and timelines. The shift to electrified vehicles has also introduced new noise sources that require attention.

To address these challenges, the industry is embracing modular development methods, creating invariant component models through simulations or tests. These models contain the necessary data to predict NVH performance when assembled in virtual environments. This Siemens educational master class is designed to equip you with the knowledge and tools to navigate this transition towards zero physical prototypes for NVH development.

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What is new?

This edition of the master class places a stronger emphasis on hands-on learning, with more than 9 hours of workshops in small groups. This format allows you to experience the software firsthand and gain practical insights you can immediately apply to your NVH engineering workflows.

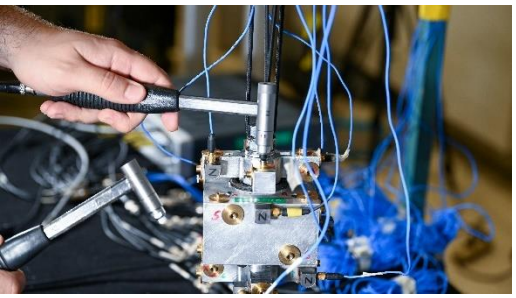
Additionally, the event will introduce a new, patented technology called Simcenter Testlab AutoCMX. This revolutionary solution enables the construction of fully automated blocked force test benches, empowering your organization to take the next step in putting this cutting-edge technology into practice.

Agenda

Tuesday, November 18

During the first day, we focus on the theory behind Component-based TPA and the collection of test data through hands-on.

9:00 – 9:15	Welcome
9:15 – 9:45	From physical prototype Troubleshooting towards virtual Prototype Prediction
9:45 – 10:45	Fundamentals of Component-based TPA
10:15 – 11:00	Break
11:00 – 12:15	Putting Component-based TPA to practice, introducing Virtual Points, CAD-based instrumentation, …
12:15 – 13:30	Lunch
13:30 – 14:30	Data collection of FRFs: Pro's and cons of impact hammer towards shaker excitation
14:30 – 15:00	Customer contribution: **Why and how Sanden developed an In-situ-TPA Blocked Force characterization method for electric compressors on testbenches** Olivier aubry – NVH specialist – Sanden
15:00 – 15:15	Break
15:15 – 17:00	Hands-on session 1 or 2
	GROUP 1: Data collection on an active system/source put to practice using shakers
	GROUP 2: Data collection on passive components, such as mounts
17:00	Closure
Evening	Networking event



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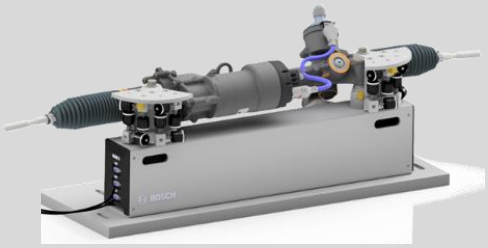
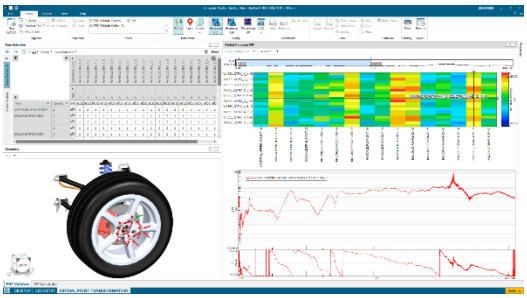
Wednesday, November 19

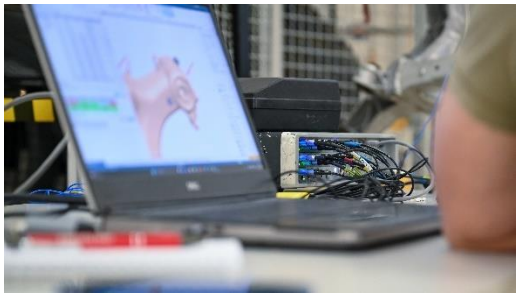
The second day further puts the technology to practice by means of case studies and more hands-on. Also the latest innovation, for fully automated blocked force data collection, called Simcenter Testlab AutoCMX is demonstrated.

9:00 – 10:00	Blocked force characterization on a wiper motor demonstrated live
10.00 -10.30	Customer contribution: **Analysis of uncertainty in TPA and virtual prototyping** Dr. Joshua WR Meggitt – Lecturer in Acoustical Engineering, Acoustics Research Center - University of Salford
10.30 – 10:45	Break
10:45 – 12:15	Building testbenches for fully automated blocked force data collection using Simcenter Testlab AutoCMX. This patented, new methodology, will be demonstrated.



12:15 – 13:30	Lunch
13:30 – 15:15	Hands-on session 1 or 2 (see day 1)
15:15 – 15:45	Break
15:45 – 17:30	Hands-on session 3 Blocked force estimation and TPA analysis put to practice
17:30	Closure
Evening	Dinner





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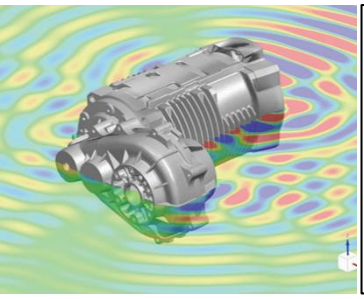
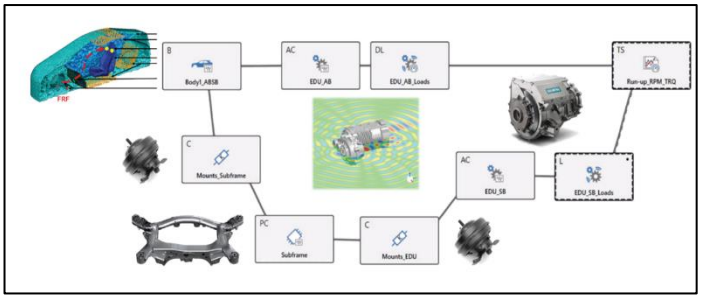
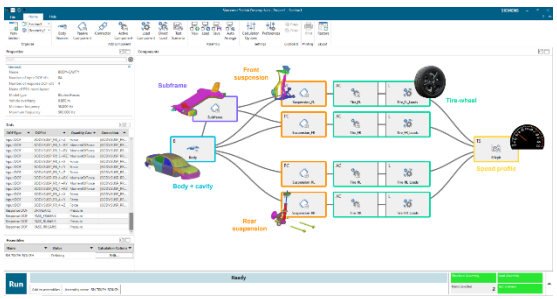

Thursday, November 20

On day 3 CAE-based data is brought into the equation, as Virtual assemblies are created using test and/or component based components. Besides looking at virtual assembly prediction, those are also auralized and transformated into single KPIs, using NVH simulator.

8:30 – 10:00	Accelerating NVH development with a hybrid virtual prototying process
10:00 – 10:15	Break
10:15 – 12:00	Hands-on Session 4
	Component modeling & creation of Virtual assemblies put to practice
12:00 – 13:00	Lunch
13:00 – 13:45	Auralization of Virtual Prototypes
13:45 – 14:30	Hands-on Session 5
	Auralization of VPA assemblies put to practice, using NVH simulator
14:30 – 14:45	Break
14:45 – 15:15	Customer contribution: **Sensitivity Analysis for Roadnoise using a Virtual Assembly based on Test-Simulation Hybrid Model with Wheel-Tire Blocked Force** Junmin Park – Senior Engineer – Hyundai Motors Europe
15:15 – 16:00	Application examples of Simcenter STS Practice, based on advanced engineering work at different companies
16:00 – 16:30	Panel of experts / Questions & Answers
16:30	Closing

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Who should attend this master class?

- **NVH managers** that want to reduce physical prototype iterations and orchestrate smoother usage of data between independent development teams within or even outside the organization,
- **NVH method development** (test or CAE), that want to get inspired on new methodologies for NVH engineering and see how to smoothly combine test and CAE models in assemblies
- **NVH engineers at automotive suppliers** who want to learn how to better provide invariant data to OEMs, compare measurement results across different sites, and predict system behavior after integration.
- **NVH Test engineers** that want to learn more about how to measure for Component-based TPA
- **NVH CAE engineers** that want to learn how their CAE data can be used in virtual assemblies

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