

## Automotive Acoustics Conference 2023

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**Place:**

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**Title:**

NVH Simulator - Advantages and ways of experiencing the new age of prototyping

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**Abstract:**

In the NVH development process, component or component changes are increasingly evaluated by simulation models only, as manufacturers are less and less able to realize real prototypes due to stricter time and cost targets. However, it is hardly possible to assess effects on noise and vibration behavior solely based on simulation results or, for example, test data determined on component test benches, because the perception of noise and vibrations in the vehicle cannot be reduced to diagrams and numerical values. The yardstick is and remains human experience. So how can manufacturers realistically evaluate NVH performance when they are conducting fewer and fewer real-world tests?

**An NVH simulator solves this problem.** It makes measurement and simulation data audible in the earliest development phases via an interactive driving noise simulation, so that decision-makers do not have to judge only based on abstract figures. It also allows judgements about the NVH performance or the design of the active sound design of electric vehicles at very early design stages, when physical vehicles are not yet available or, for example, the installation of the components is not permitted for safety reasons. In virtual test drives, engineers can also modify different transmission paths without real prototypes or selectively hide individual paths, then evaluate them and thus identify optimization potentials.

This presentation also shows ways in which manufacturers can meaningfully integrate an NVH simulator at various points in the development process. With various expansion stages – from a simple desktop simulation to state-of-the-art application in the complete vehicle simulator – it can be optimally adapted to the respective requirements.

**An NVH simulator makes simulated sound and vibration behavior a real experience and thus paves the way for the digital twin.**

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