

Automotive NVH Comfort Le Mans 2023

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Place:

Palais des Congrès, Le Mans, Frankreich

Title:

Real-time Synthesis in an NVH Simulator: Combine Live Powertrain Test Bench Data with TPA vehicle model

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Abstract:

A new method is presented for synthesizing vehicle interior noise in real-time using the NVH simulator and source data from an engine test bench. While the simulator's vehicle driving model controls the engine on the test bench, the source signals are recorded and directly fed into a filter matrix for interior noise synthesis, while wind and tire noise can be added as well.

The filters are created from condensed transfer functions of an associated vehicle TPA model, in which all relevant airborne and structure-borne noise paths are considered. The filter design is optimized for minimal delay of the resulting sound synthesis.

The time needed in the common approach for measurements and creation of the powertrain noise dataset is skipped and the resulting sound is produced in real-time. Using this method, engineers and decision makers can experience the effects of powertrain modifications immediately and interactively in a realistic environment, including masking noise.

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