

inter.noise 2024

25 – 29 August

Place:

Nantes, France

Title:

Efficient Tuning of Active Sound Design in Electric Vehicles – An Interactive Validation Approach

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Abstract:

The implementation of active sound design models in a target vehicle requires careful tuning of all synthetic sound elements with respect to existent vehicle interior noise, current driving conditions and general driving styles.

Besides the creative aspects in sound design, this tuning process is highly time-consuming. It must be ensured that load feedback, speed feedback and general interactivity with the synthetic sound meet the driver's expectations and match the intended emotional expressions of the sound concept. Testing the tuning parameters in real vehicles requires access to the vehicle prototype and all involved system components, which is often not granted in early development stages.

A key approach to overcome this difficulty is the application of acoustic driving simulator technology, directly linked to the main tuning parameters. Combining this methodology with an efficient procedure for perceptive assessment of the sound design model, an interactive approach to active sound design is established.

This paper discusses current progress in the field of efficient tuning of active sound design models, presenting a case study for a high-performance electric vehicle.