

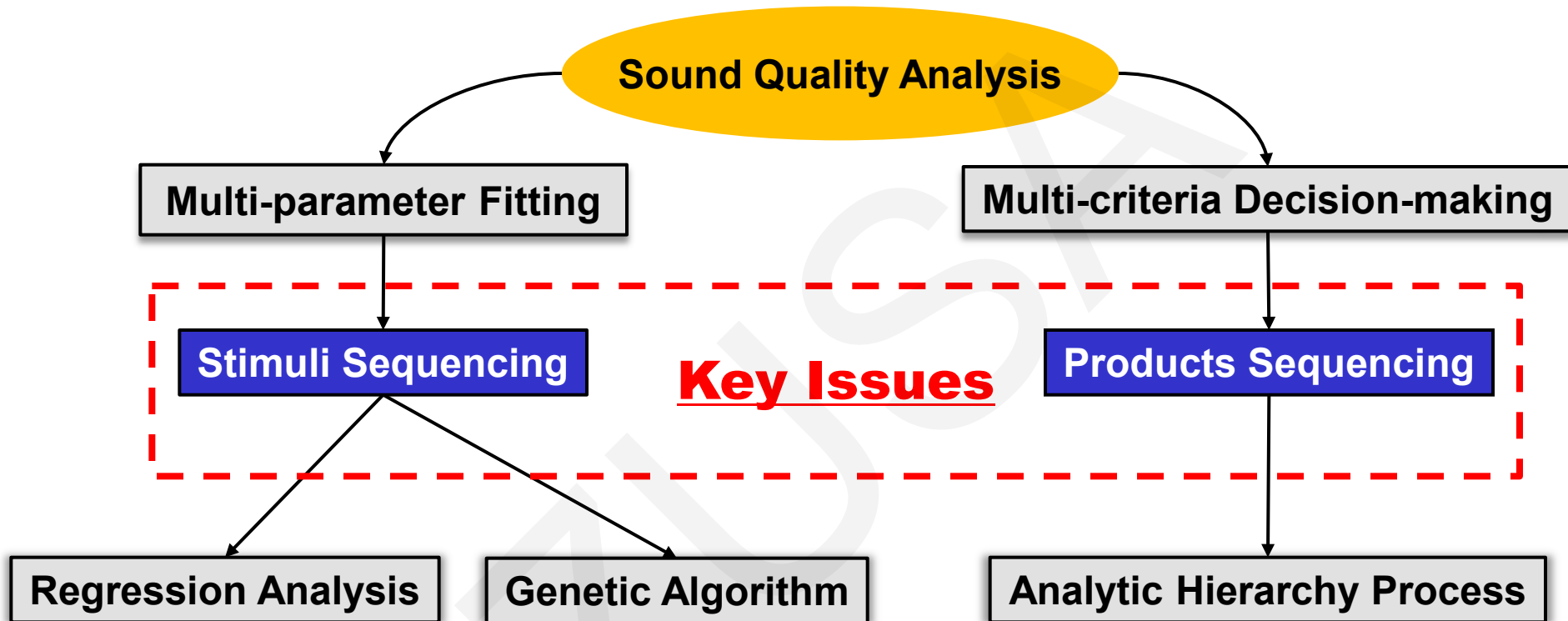
A comprehensive evaluation method of diesel engine sound quality based on paired comparison, uniform design sampling, and improved analytic hierarchy process

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Purposes of Sound Quality Analysis



- The relationships between the objective characteristics of the sound signal and the subjective feeling
- The comprehensive evaluation of a certain product sound quality and the sequencing of different products

Detailed Steps of UDS-AHP

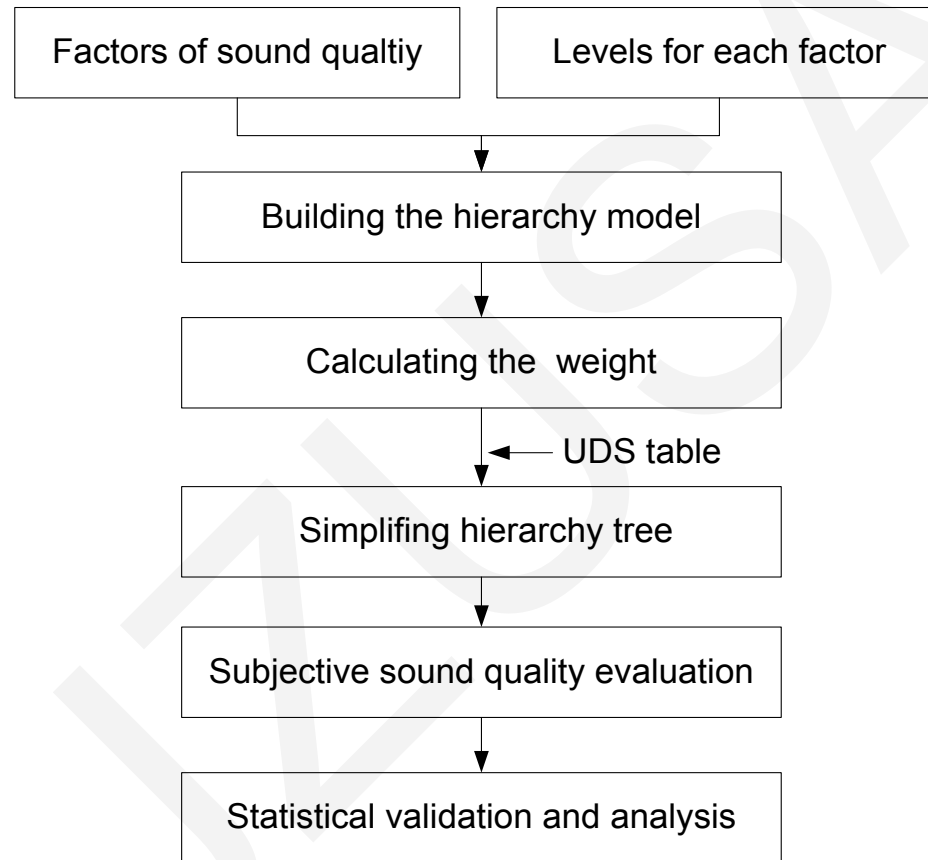


Fig. 1 Flowchart diagram of UDS-AHP

Comprehensive Evaluation Model

- A subjective sound quality evaluation procedure with 375 stimuli

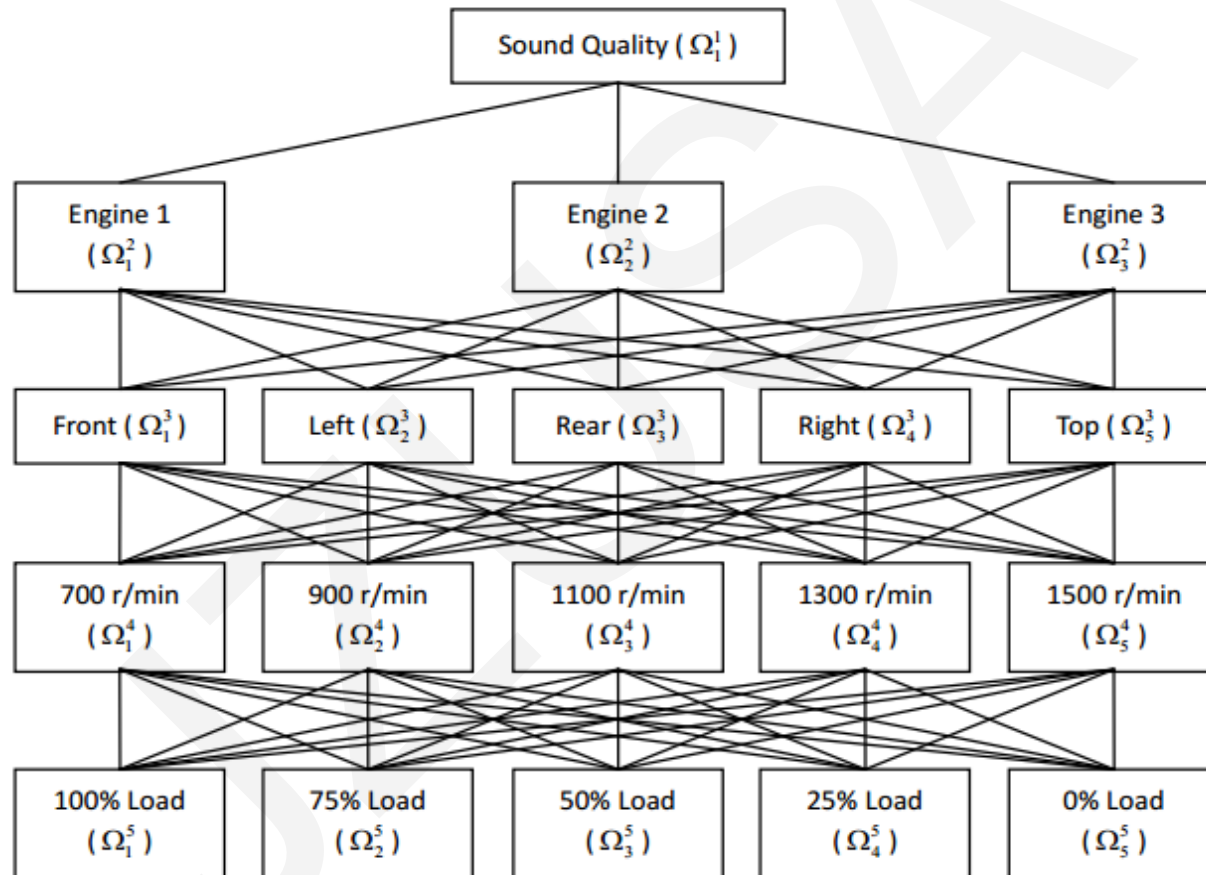


Fig. 2 Hierarchy tree of comprehensive evaluation model of diesel engine sound quality

Comprehensive Evaluation Model

- A subjective sound quality evaluation procedure with 45 stimuli

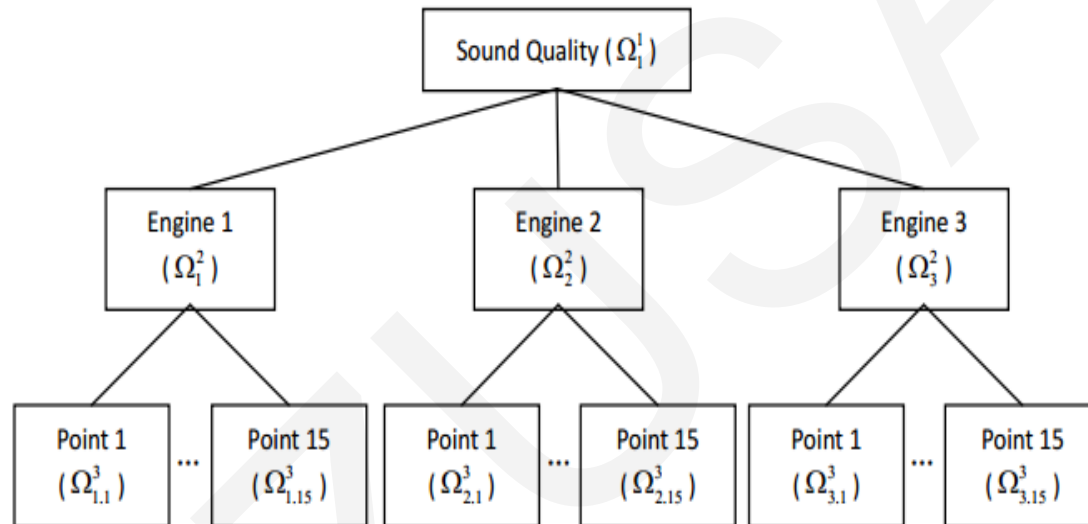


Fig. 3 Improved hierarchy tree of comprehensive evaluation model of diesel engine sound quality

Conclusions

- The comprehensive evaluation method, UDS-AHP, of sound quality is proposed focusing on solving the multi-factor, multi-condition problem, and reducing time and difficulty of a subjective jury test at the same time.

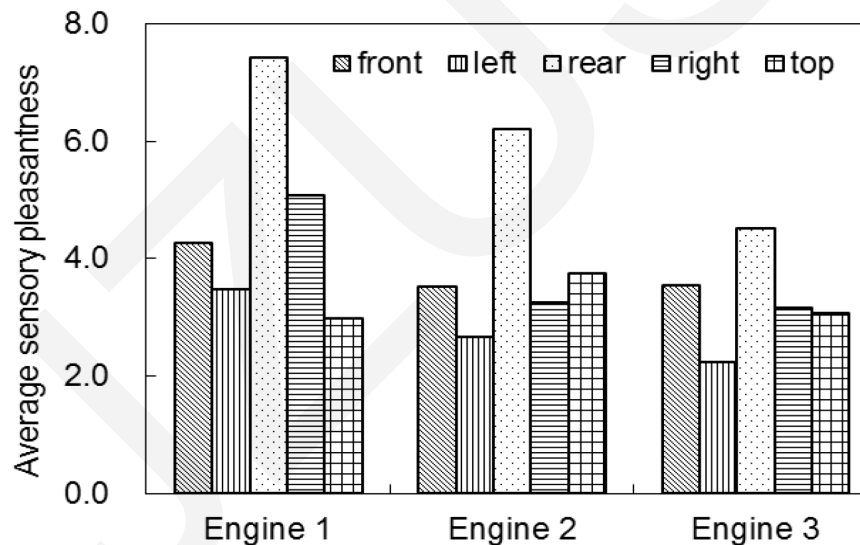


Fig. 4 Evaluation result comparison of three diesel engines based on five noise test positions