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Title:

Psychoacoustics for the creation of acoustically green city areas

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Abstracts:

Psychoacoustics has become increasingly important for community and environmental noise as well as soundscape research. Unfortunately, recent noise control approaches still interpret mostly sound pressure levels and does not focus on the subjects perception. However, there is growing consent about the necessity to apply further hearing-related parameters for a better understanding of environmental noise annoyance phenomena. In this context the identification of the most important psychoacoustic quantities reflecting human responses to noise is the major task.

Especially with regard to the preservation and creation of quiet areas (Q-zones) according to the EC 2002/49 advanced evaluation tools and meaningful acoustic indicators are necessary to fulfil the ambitious goals regarding the creation of acoustically green city areas. Concepts of banning disturbing vehicles from quiet zones could guarantee that defined noise limits are not exceeded. In this context vehicles could be classified with respect to their noise emissions with coloured badges comparable to fine particle stickers. However, for an effectual classification of the acoustic emission of vehicles, the human perception and evaluation of vehicle pass-by noise must be studied in detail and psychoacoustic parameters applied. Furthermore, a traffic synthesis tool for the auralisation of specific traffic scenarios is developed to simulate for example the effect of new vehicle types on the resulting traffic noises. The synthesis tool could be used in principle for (a) the creation of audible maps, (b) testing the perceptual efficiency of potential noise mitigation measures and (c) examining the influences of different traffic compositions or traffic management measures on the noise and noise annoyance respectively. The mentioned working tasks are carried out within the European research project "City Hush" with a special focus on the psychoacoustic evaluation of hybrid vehicles.

The current status of the development of psychoacoustic noise labelling of vehicles as well as of the traffic synthesis tool will be presented and first results introduced and discussed. In general, the potential of these approaches regarding the improvement of environment noise quality will be discussed from an ecological point of view.

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