THE STUDY OF SOUNDSCAPE

COST Training School 2012 on "Measurement, Analysis and Evaluation of Soundscapes"

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PARTICIPANTS: 17 young researchers

Soundscape...

- Is context dependent
- Shifts the way that environmental acoustics and noise are evaluated nowadays
- Is basis of the evaluation and design of the acoustic environments
- Requires holistic approach

Soundscape and soundwalks

- Soundwalk:
 - In-situ listening of an environment
 - Making ratings and comments
 - Gathering impressions on the soundscape
- Soundwalk in Aachen:
 - Two groups of listeners
 - Eight sites
 - Evaluation sheet:
 - Loudness and unpleasantness ratings
 - Presents of the sources and particular sounds
 - Feelings and thoughts
 - Recordings made with SQuadrigall system



Psychoacoustic parameters

- Modeling the processes of human hearing to extract the single value from acoustic data
- Values obtained from ArtemiS software
- List of calculated parameters:
 - Equivalent Continuous Sound Pressure Level (L_{Aeq})
 - Loudness (DIN 45631/A1) (*N*)
 - Sharpness (DIN 45631/A1, Aures model) (S)
 - Hearing Model Roughness (HMR)
 - Relative approach (*RA*)

Psychoacoustic parameters



Psychoacoustic parameters



Perceptual analysis

- Evaluation sheet filled during the soundwalk
- Marking of:
 - Loudness and unpleasantness
 - Audible sound sources
 - Impressions and thoughts on the sound environment



Correlations of parameters

- Comparison of psychoacoustic and perceptual parameter
- First or second order polynomial regression function (coefficient R) calculated
- Combinations:
 - Measured L_{Aeq} , perceived loudness
 - Measured L_{Aeq} , perceived unpleasantness
 - Measured loudness percentile, perceived loudness

Correlations of parameters



Correlations of parameters



Laboratory vs. field ratings

- Laboratory test:
 - Reproduction of recordings over headphones
 - Evaluation of the perceived loudness and unpleasantness
 - Firstly 8 recordings of all places
 - Secondly 3 recordings with the locations pictures
- Field evaluation continuous 5-pt scale
- Laboratory test discrete 9-pt scale

Laboratory vs. field ratings



Laboratory vs. field ratings

Unpleasantness - Lab vs. Field



Concluding remarks

- Case study of the measurement, analysis and evaluation of urban public areas in Aachen was made
- Evaluation with the psychoacoustic measures, as well as the perceptive evaluation, is of significance in order to find the soundscape impact on people
- Only one analysis method would not be sufficient for obtaining detailed results for a soundscape study
- Need for the soundscape approach

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Thank you for your attention

