Sound Environment, Architecture and City, Prediction, Measurement, Assessment　　Acoustic laboratory（Ce-101, Ce-B05）

SAKAMOTO LAB.

[Sound Environment in Architecture and City]

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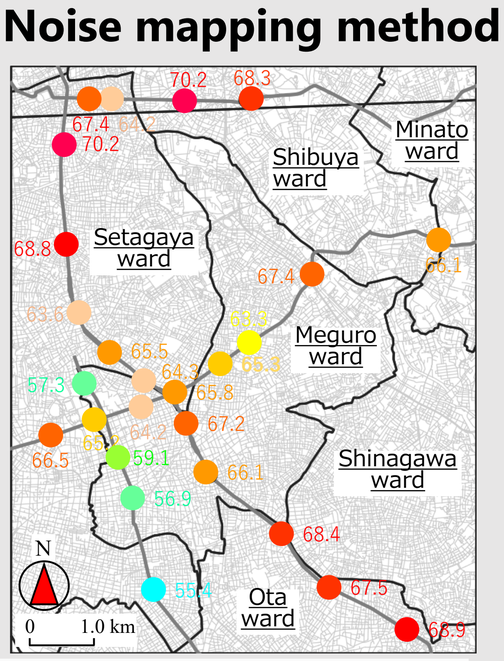
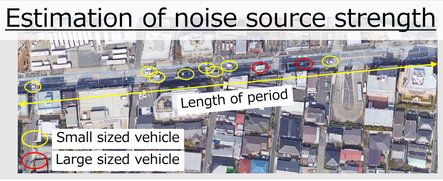
Sounds surround our lives. Sakamoto laboratory treats various issues on acoustic control, measurement, prediction and assessment, in order to realize better sound environment. Evaluation and measurement of acoustical environment will be introduced.

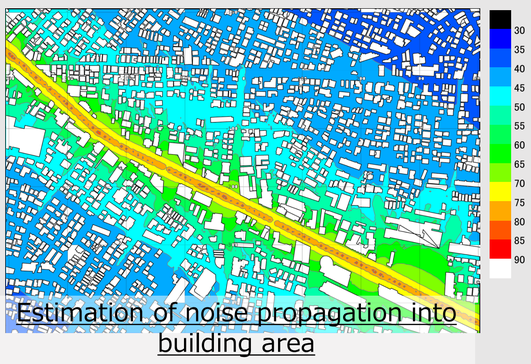
- ◆ **Room acoustic design**： Acoustical design of auditoria, Speech privacy, Classroom acoustics
- ◆ **Building acoustics**： Sound insulation of building façade
- ◆ **Acoustic measurement**： Impulse responses, Sound insulation, Sound reflection and absorption
- ◆ **Development of prediction methods**： Wave-based numerical analysis
- ◆ **Development of sound field simulation**： 6 channel recording-reproduction system
- ◆ **Environmental noise**： Prediction model of Road Traffic Noise, Railway Noise, Wind Turbine Noise, Equipment Noise

Noise mapping method



Estimation of noise source strength





Estimation of noise propagation into building area

Accurate and efficient methods for creating environmental noise maps that are effective for environmental management are examined separately for noise source strength and noise propagation within Building (residential houses) area. For noise source model, we propose a usage of aerial photograph data.

Road traffic noise modeling

Development of automatic data processing

- ➢ Measurement
  Video camera
  Sound level meter
- ➢ Auto processing
  Event detection
  Running speed
  Vehicle type classification
  Sound power level

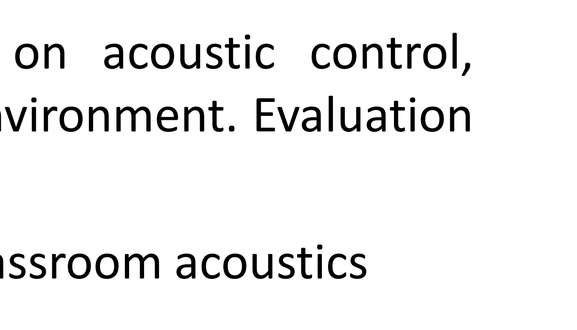
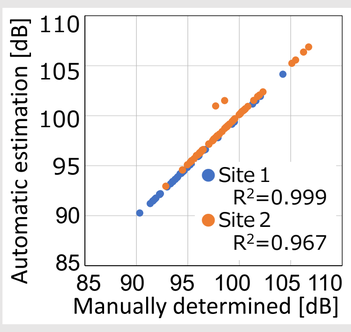


Image processing

Our laboratory contributes to developing Japanese road traffic noise prediction model. This research proposes an automatic data processing method for evaluating the sound source using image processing and machine learning.

in-situ measurement



Estimation result of PWL

Predict → Measure → Reproduce → Assess

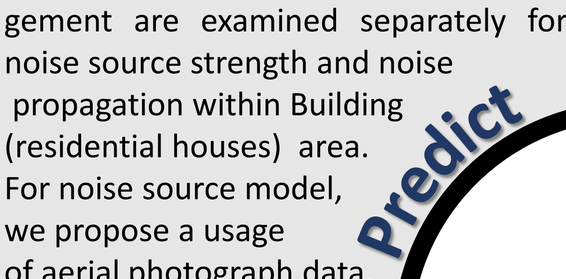
Subjective evaluation of environmental sound of railway station

Field measurement

Field experiment

3-dimensional sound reproduction system

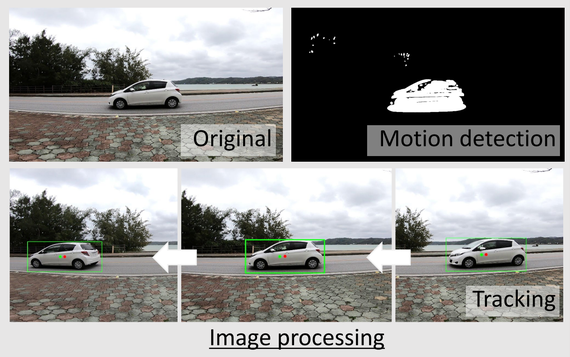
The sound environment of railway stations is composed of various sounds, such as the sound of passing trains, announcements, and the crowds of people. Auditory tests are conducted to investigate the psychological effects of changes in the sound environment due to the interior materials.



Audio-visual interaction for environment evaluation

Three-dimensional sound field reproduction system using 6-channel loudspeakers has been built in anechoic room. Audio-visual interaction on evaluation of environment is investigated using combination system of 6-ch. loudspeakers and dome projector.

The effect of visual stimuli on the subjective evaluation were studied under various sound sources and listening situations.



Audio-Visual reproduction system