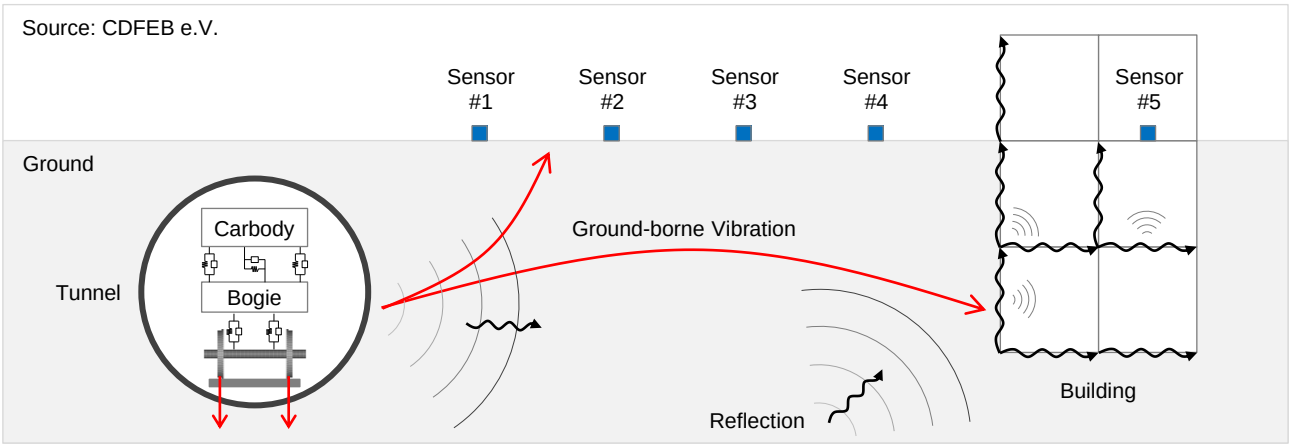
Masterarbeit zu vergeben

Numerical Prediction of Ground-borne Vibrations induced by Underground Rapid Transit

Numerische Vorhersage von Bodenschall Erschütterungen durch unterirdische Schnellbahn

Railways provide economic and social benefits and partially compensate for the shortcomings of other means of transportation. At the same time, there are negative environmental impacts on areas adjacent to a track or tunnel. Noise and vibration, among several factors, often annoy people and even cause social problems regarding railway operation and its network extension. Therefore, the wave propagation of noise and vibration induced by railway vehicles in service should be numerically predictable, and the subjective perception of people exposed to them needs to be assessed quantitatively according to relevant standards.

This study aims to numerically predict the ground-borne vibrations induced by underground rapid transit and assess their environmental impact on the ground and buildings according to relevant standards. The first task is to build 3D ground models with homogenous soil properties based on the results of previous studies on 2D ground models. The second task is to map wheel-rail contact forces calculated from a vehicle-track dynamics model onto 3D ground models as a moving source. The third task is to automate the above simulation process with Python. These tasks basically require an understanding of vibration, acoustics, and finite element method with basic programming skills in Python.



Knowledge of the following lectures is advantageous:
„Vibration“, „Acoustics“, „Finite Element Method“

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