Lehrstuhl für Baustatik und Baudynamik | RWTH AACHEN UNIVERSITY

Master Thesis

Development of a Benchmark Structure and Identification of its Nonlinear Dynamic Properties

Background

Benchmarking of new approaches using real structural data is an important step both for research and industrial applications. In the context of structural dynamics, probably the most prominent structure is the one, which belongs to the Los Alamos National Laboratory of the USA. This structure exhibits nonlinear dynamic response and has been used in numerous studies, Fig. 1a.

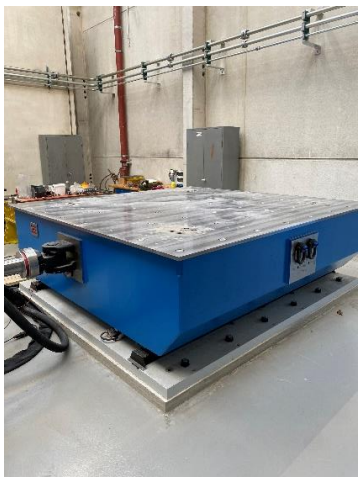
a   b

Figure 1: Benchmark structure with three storeys connected to an actuator (a) and shaking table facility of LBB (b).

Aim

The primary goal of this thesis is to replicate the benchmark structure according to [1]. Furthermore, the nonlinear dynamic properties of the structure are to be identified using the large shaking table of LBB. For this purpose, data-based methods, such as Kalman Filter, as well as machine learning approaches, such as artificial neural networks, are to explore.

[1] Figueiredo E. et al. *Structural Health Monitoring Algorithm Comparisons Using Standard Data Sets*. Technical report LA-14393, Los Alamos National Laboratory, 2009.

Prerequisites

The thesis has no specific prerequisites!

Language

The thesis can be written in English or German.

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