

Bachelor Thesis

Construction, Experimental

Construction of elastic multi-storey structure

Conditions

Duration: 3 months

Requirements: construction/design skills/MATLAB

Language: english/german

Target group: Bachelor students

Content

Measuring responses, and loads on structures is an important task in structural health monitoring (SHM). Based on the sensor information lifetime, and reliability of structures can be estimated, and damage can be detected, and classified. Additionally, the effect of wind loads on structures can be studied.

In this thesis, a model of a multi-storey structure should be constructed. The structure consists of columns and panels. External loads are applied to the structure using an impact hammer. The effects of the external loads should be measurable by accelerometers, strain gauges, and force sensors. For the panels, different materials are considered (metal sheets, FRP), and are interchangeable.

After assembly, a modal analysis of the structure should be realized.

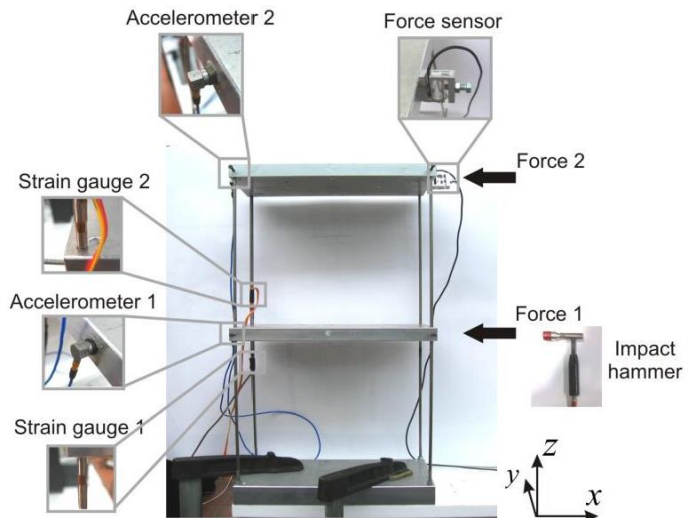


Fig. 1 Two-storey structure [Niu et al., 2011]

The main tasks of the work are summarized as follows:

- Design of a multi-storey structure (conceptual drawing, and specification sheet)
- Selection of suitable sensors
- Garage support
- Assembly of all components and validation of sensors
- Modal analysis of the structure
- Documentation and presentation of results

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