

MASTER'S DISSERTATION AT STRUCTURAL MECHANICS

DEPARTMENT OF CONSTRUCTION SCIENCES | FACULTY OF ENGINEERING LTH | LUND UNIVERSITY



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PRESENTATION

JUNE 2023

REPORT

Will be published as
Report TVSM-5263

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EXAMINER

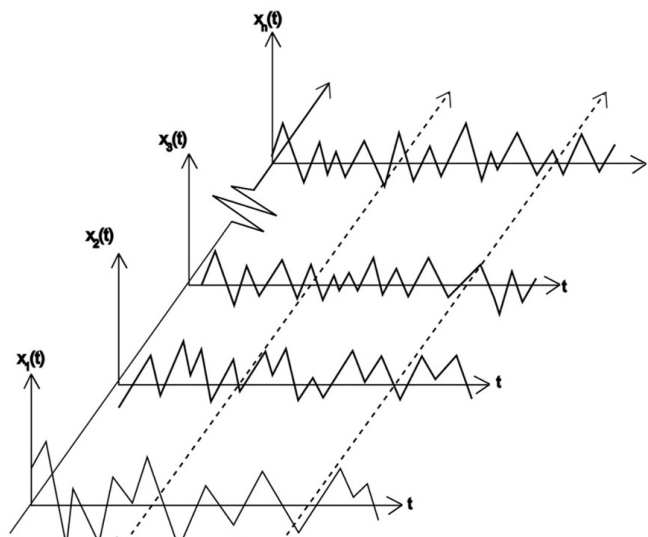
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THE WORK IS PERFORMED AT
DIVISION OF STRUCTURAL
MECHANICS, LTH

IN COOPERATION WITH
SWECO AB



STOCHASTIC MODELLING OF FOOTFALL INDUCED VIBRATIONS



BACKGROUND

Past research with the aim of increasing the accuracy of finite element models for footfall induced vibrations in floors have shown that the predicted responses are sensitive to the applied load function. This can lead to calculated vibrations levels which do not reflect the behaviour of the actual building. A multitude of models exists for predicting footfall induced vibrations, in which some models are stochastic and takes into consideration the random nature of human walking.

AIM

The aim and objective for this master thesis is to increase the accuracy of FE-models that predict footfall induced vibrations. This will be done by analysing the use of various load-functions for footfall of a single pedestrian and then apply it in FE-models. The questions that will be investigated are:

- How is the response affected by using different load models and how does it relate to responses predicted with design guides given by the Concrete Society for The Concrete Centre, Steel Construction Institute and to experimental measurements on an existing construction?
- How should the stochastic models be adopted to give balance between conservative result that accounts for uncertainties and accurate prediction of the vibration level in the constructed building?

METHOD

The methods that will be used is a literature study, finite element models made with the software Abaqus and measurements on floor structures.

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