Department of Civil and Environmental Engineering
DISTINGUISHED SEMINAR

Test and Validation in the Age of Simulations of Dynamics

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Wednesday October 16, 2019
103 Churchill Hall
12:00 PM

This seminar is free and open to the public.

ABSTRACT: Numerical models for structural dynamics analysis are notoriously difficult to build correctly, due to the sensitivity to small changes in, particularly, the stiffness matrix. Also, dynamic loads and boundary conditions in operating conditions of, for example, a building or a offshore structure, may be difficult to know accurately. Experimental structural dynamics is a field where measurements and methods for validating and calibration of numerical models are developed. This area has developed fast in the last decades, so that we today have relatively efficient methods for both model validation (to see if the numerical model agrees with experimental data), and calibration (where the numerical model is changed to better agree with the experimental data). These tools include experimental modal analysis, operational modal analysis, as well as experimental sub-structuring.

During many years, predictions have been that numerical analysis (FE modelling, typically) and simulation would somehow obsolete test. On the contrary, however, the need for experimental structural dynamics has increased proportionally to the increase in simulations. With an emphasis on civil engineering structures, the presentation will focus on presenting some important structural dynamics tools, and discuss that, and why, it is vital that dynamic models are validated before simulations are performed.

Bio: Anders Brandt, is an Associate Professor at University of Southern Denmark. He has over 30 years of industrial and academic experience as a researcher, teacher, and consultant in applications of signal analysis and experimental structural dynamics in mechanical and civil engineering applications. Anders is also the author of "Noise and Vibration Analysis – Signal Analysis and Experimental Procedures," published by Wiley 2011. Additionally he is the designer of the free ABRAVIBE toolbox for MATLAB, that provides tools for teaching and learning vibration analysis, and is maintaining the website abravibe.com with additional resources for teaching, learning, and applying vibration analysis. Anders is a devoted and appreciated teacher and has held over 250 industry short-courses around the world, on topics such as data acquisition, vibration analysis, and modal analysis, besides his 20 years of academic teaching.

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