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IALCCE 2012

Third International Symposium on Life-Cycle Civil Engineering

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IALCCE

The Symposium is organized on behalf of International Association for Life-Cycle Civil Engineering (IALCCE) under the auspices of the University of Natural Resources and Life Sciences. IALCCE (www.ialcce.org) is a young Association founded in October 2006. Its activities encompass all aspects of life-cycle assessment, design, maintenance, rehabilitation, and monitoring of civil engineering systems.
The International Symposium on Life-Cycle Civil Engineering is a biennial event. In 2012, Austria will host the Symposium for the first time. The IALCCE 2012 Symposium provides an opportunity for academics, engineers, architects, and builders from Austria, Europe, and around the world to keep themselves up to date with latest developments in the field of life-cycle civil engineering.

Mini - Symposium MS 3-1:

Vibration-based Health Monitoring, Damage Identification & Parameter Estimation for Civil Engineering Structures

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This mini-symposium deals with vibration-based health monitoring, damage identification and parameter identification for civil engineering structures (bridges and viaducts, buildings, towers, ...).

In vibration-based structural health monitoring and damage identification (detection, localisation, quantification, and prognosis), an attempt is made to identify structural damage from vibration data of a structure. For civil engineering structures, data obtained under ambient excitation is often used due to the difficulties associated with the forced excitation of large structures. A distinction is made between model-based and non model-based damage identification methods, depending on whether the identification relies on a physical model, e.g. Finite Element model, of the structure. A two-stage procedure is often applied where (1) a black-box model of the structure is identified from time or frequency domain data and (2) features of the black-box model such as the modal parameters (natural frequencies, mode shapes) are used to update a physics-based model. This methodology can be used to identify damage as a local reduction of the stiffness in the structure or to tune the structural model, such that the response predictions are in line with the observed behaviour of the structure. The resulting model can be used to update response and reliability predictions.

This minisymposium welcomes novel contributions on vibration-based structural health monitoring, damage identification, as well as parameter identification, using black-box as well as physics-based models. Relevant topics are linear and nonlinear system identification, statistical system identification methods (maximum-likelihood, Bayesian inference) for parameter and state estimation, model updating and correlation, uncertainty quantification in parameter identification, model class selection based on system response data, stochastic simulation techniques for state estimation and model class selection, optimal strategies for experimental design, optimal sensor location methods, updating response and reliability predictions using data.