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International PhD Course
"Civil and Environmental Engineering"

Data-driven diagnostics of the support structures of operational wind turbines as an input for system identification and asset management

Prof. **Ruediger Hoeffer** – ***Ruhr-Universität Bochum***

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11,00-13,00
Aula Caminetto

Modern wind turbines and their supporting structures have to meet growing demands for higher productivity and reduced downtimes. This has led to the realization that efficient monitoring, which especially include continuous structural health monitoring (SHM), and robust diagnostic methods are required in order to be able to control structural risks caused by defects or ageing and, on the other hand, to be able to evaluate life cycle issues. The difficulties in analyse operating wind turbines can be attributed to the following factors, among others: limited knowledge of the loading conditions, structural-mechanical complexity, strongly changing operating procedures and environmental factors, complex and strongly location-dependent soil-structure interactions as well as the typical uncertainties with regard to incomplete sensor data. The concrete development result of the work is to analyse the measured, strongly non-stationary and for many reasons noisy structural responses by a robust diagnosis, which quantifies the condition of the structure or its degree of damage in real time and in a timely and automated manner. The diagnosis can be used to as a basis towards risk-based maintenance strategies and management issues.

Prof. Ruediger Hoeffer
Full professor since 2003 and head of the Building Aerodynamics Laboratory and since 2017 dean of the Faculty of Civil and Environmental Engineering at the Ruhr University Bochum. After his graduation 1988 he worked as a research assistant and received 1996 his doctoral degree at Ruhr University Bochum. From 1995 to 1997 he was visting scientist at the Danish Maritime Institute at Copenhagen/Denmark, and at the research institute CRIACIV at Prato, University of Florence/Italy. Since 2010 he is ordered by the province government to fulfil approval tasks for submitted static calculations and building structures under execution ("Prüfingenieur für Baustatik"). Prof. Höffer is author and co-author of more than 60 papers and co-editor and co-author of several books.

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