



Pozvánka na přednášku / Lecture Announcement

Název / Title

Topology optimization, concrete printing & FRP applications in structural and civil engineering

Přednášející / Lecturer

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Jazyk / Language English

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FCE BUT, Brno, Veveří 331/95,
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Abstrakt / Abstract

A number of materials, design & optimisation methods, and manufacturing methods have been limited to high end applications such as aerospace, automotive or medical applications for a long time. Such materials include fibre reinforced polymers, optimization methods include FE based topology optimization, and manufacturing methods include additive manufacturing with structural properties. These methods have only recently become available to the structural and civil engineering society for reasons of cost reduction and increased calculation power, or due to dematerialization needs imposed by environmental requirements. In engineering, topology optimization refers to a set of numerical techniques aiming at distributing material within a design domain subject to a set of boundary conditions and loads in such a way that one or more objectives are optimized, e.g. stiffness, stresses, deformations,... These methods are addressed in a civil/structural environment and extended to multi-physics optimizations in which e.g. stiffness and thermal insulation are addressed simultaneously. Such optimization will typically lead to more organic and complex shapes, uncommon for structural engineers and difficult to create with traditional production techniques such as concrete casting. In this, concrete printing may be helpful, allowing dematerialization by shape optimization without additional formwork cost. Finally the use of fibre reinforced polymers in civil engineering becomes more and more relevant with close to 2000 applications in the Netherlands, and increasing interest and number of applications in Belgium. Current state of the art, research at Ghent University, and future challenges will be addressed in these three emerging fields.

Přednášející / Lecturer

Prof. dr. ir. Wouter DE CORTE is Associate Professor at the University of Ghent (Belgium). He graduated in Civil Engineering and then prepared a PhD at the Civil Engineering department of Ghent University. He joined Delft University and Ghent University College before returning to the Structural Engineering Department of Ghent University. He is currently working on a number of projects related to structural modelling, shape optimization and concrete printing.

Organizátoři / Organizers

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Projekty / Projects

- projekt 3.1 Podpora mezinárodní mobility akademických pracovníků (RP9093100202 / 11121)
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