



FACULTY OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING
STRUCTURAL MECHANICS SECTION
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The Structural Mechanics Section of the Department of Civil Engineering of KU Leuven invites applications for

2 PhD positions on computational structural dynamics and vibro-acoustic wave propagation

The Structural Mechanics Section of KU Leuven is performing internationally leading research on noise and vibrations in the built environment and vibration-based structural identification and evaluation, combining both theoretical and experimental work. A wide range of applications is covered, including sound insulation, monitoring of vibrations, dynamic system identification, parameter identification, and structural health monitoring (<http://bwk.kuleuven.be/bwm>).

Research Project

The analysis of sound and vibration transmission in buildings, civil structures, cars, airplanes, etc., is a complex problem since multiple transmission paths are usually important, uncertainties can have a large effect, performance requirements often conflict with structural and thermal requirements, and accurate vibro-acoustic modelling with currently available numerical prediction tools requires a huge computational effort. An efficient yet sufficiently accurate analysis framework is therefore needed, taking all relevant uncertainties into account and opening up the way for model-based optimization. The development of such a framework is the main target of the research project VirBACous, which is being funded by the European Commission under the form of an ERC Starting Grant (http://cordis.europa.eu/project/rcn/209704_en.html).

PhD topics

Within this project, there are 2 open PhD positions. Each PhD will focus on an important open problem. With current state-of-the-art methods, the vibro-acoustic performance of relatively simple individual structural elements (e.g., the airborne sound insulation of a layered wall with homogenous layers) can be predicted with good accuracy at reasonable computational efforts. This is not the case, however, for complex structural elements (e.g., lightweight floors or facade elements) and for structural systems, consisting of several coupled elements (e.g., buildings or aircrafts). PhD 1 will focus on the development of methods for vibro-acoustic analysis of structural elements that have a high degree of geometrical and/or material complexity. PhD 2 will focus on the development of methods for predicting the flanking vibration transmission across realistic, complex junctions between structural elements such as walls, floors, roofs, beams, columns, etc. In both cases, the targeted development will involve the exploration and hybridization of advanced concepts in structural dynamics and vibro-acoustic wave propagation, including finite element and boundary element techniques and modern statistical energy analysis.

Profile

Candidates are expected to have obtained, or to obtain in the near future, a MSc degree (or equivalent) in Civil or Mechanical Engineering or a closely related field with very good to excellent grades. A solid background and demonstrable interest in at least two of the following topics are essential: finite element analysis, structural dynamics, and engineering acoustics. Additionally, very good research, communication and programming skills, proficiency in English, and a strong motivation towards completing a PhD within 4 years are required.

Offer

We offer a collaborative and internationally oriented research environment at one of the leading engineering faculties worldwide. The successful candidates will be supervised by an ERC Starting Grant holder. They will have access to the fully equipped KU Leuven Structural Mechanics Laboratory (actuators, transducers, acquisition systems and software for sound and vibration testing in laboratory and in situ environments), the KU Leuven Acoustics Laboratory (transmission suite, reverberation chamber, anechoic chamber), and to extensive computational resources. The successful candidates will also be encouraged to present their work at international conferences and they can benefit from our strong international research network. The Civil Engineering Department is located centrally in Europe in a scenic setting, next to the Arenberg Castle at the outskirts of Leuven. The positions are full time with a maximum duration of four years. The successful candidates are expected to take up the positions between April and September 2018.

Application

Interested candidates who meet the qualifications are encouraged to apply through the link to the online application tool available at <https://icts.kuleuven.be/apps/jobsite/#/vacatures/54501969> no later than 13 February 2018. Applications should include (1) a motivation letter (max. 2 pages) describing why the applicant is applying to this particular position and how the position fits into his or her career plans, (2) a full cv showing how the applicant's profile fits the requirements, (3) a complete transcript of records to date, (4) a proof of proficiency in English or Dutch (TOEFL/IELTS certificate or native speaker), and (5) an electronic copy of the MSc thesis or research project report (if already available). For more information please contact Prof. Edwin Reynders (tel.: +32 16 32 16 77, email: edwin.reynders@bwk.kuleuven.be).