

Vacancy "Design methods and computational tools for delay based vibration control of mechatronic systems", KU Leuven & CTU

Context and topic

Recently novel techniques for vibration absorption, which involve the use of delay based input shapers and so-called delayed resonators, have been developed and successfully applied to flexible mechatronic systems. The aim of the PhD project is to analyze properties of poles and zeros of multi-input multi-output systems with delays, and to develop and validate optimization based control design techniques, grounded in simultaneously shaping spectra of poles and zeros, and capable to solve co-design problems of absorbers and higher-level controllers (to position a platform or to manipulate a robot's arm). The requirement for solving co-design problems stems from the property that for future-generation delay based vibration suppression techniques, a separation principle allowing a separate design of absorbers and controllers, is no longer viable, necessitating fundamentally different design tools.

Offer

We offer fully funded PhD position in an international context for four years at the KU Leuven and CTU Prague, two top European universities and hubs for interdisciplinary research in the fields of Applied Mathematics and Systems & Control, thereby aiming at a double doctorate. The vacancy fits within a long-standing collaboration and joint project between the research group of W. Michiels (KU Leuven, NAAM - Numerical Analysis and Applied Mathematics Center) and the group of T. Vyhlídal (Czech Technical University in Prague, Faculty of Mechanical Engineering). The main host will be the NAAM section of KU Leuven. The successful candidate is expected to spend one year of the PhD at the CTU, along with several short visits.

Profile

The ideal candidate has a Master degree in either computational / applied mathematics or in mechanical engineering, and have a strong interest in interdisciplinary work. Applicants whose mother tongue is not English must present an official language test report. The acceptable tests are TOEFL, IELTS, and Cambridge Certificate in Advanced English (CAE) or Cambridge

Certificate of Proficiency in English (CPE). Required minimum scores are:

- TOEFL: 600 (paper-based test), 100 (internet-based test);
- IELTS: 7 (only Academic IELTS test accepted);

How to apply

Send an electronic application (CV, motivation, reference contacts) to Prof. Wim Michiels (Wim.Michiels@cs.kuleuven.be), in CC to Prof. Vyhlídal (Tomas.Vyhlidal@fs.cvut.cz), with subject "vac-comp".

Deadline

August 15, 2020.