

Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name : Given names :

Status (prof., assistant prof., ...) :

Laboratory : Website address :
Institution : Website address :

Scientific competence of the supervisor:

The research field of the supervisor covers: structural vibration, wave propagation, periodic structures and model reduction. He is a well-recognized international expert in these fields and possesses strong skills in the dynamic analysis of periodic structures. He published more than 20 research articles on this topic and initiated strong partnerships with several national and international institutions (Ecole des Ponts ParisTech in France, University of Campinas in Brazil, São Paulo State University in Brazil, among others).

Two major publications in the field proposed for the PhD :

1.
2.

Website address of the personal page :

Supervisor's email :

Description of the research work proposed for a PhD

Topic # (see list) :

Title :

Subject :

This Ph.D. proposal aims at analyzing the propagation of waves in structures which are 1D periodic, i.e., which are composed of identical substructures that are assembled to each other along a straight or circular direction. Those substructures can be of complex 2D or 3D shape, and as such, they are usually modeled via finite elements. For periodic structures connected to an array of springs or resonant devices (mass-spring systems), it is well known that band gap effects occur. These are characterized by frequency bands on which waves do not propagate, and as such, they constitute an interesting means to passively control the vibration and sound levels of engineering structures. The use of nonlinear devices, instead of linear springs and linear mass-spring systems, seems interesting for improving the band gaps effects. This aims at increasing the bandwidths at which band gaps occur to make them useful for a wider range of engineering applications. The Ph.D. studies will start with assessing the wave propagation in linear periodic structures. The analysis of the wave propagation in periodic structures with local nonlinearities, such as nonlinear springs, will be further undertaken. Also, the forced response of nonlinear periodic structures, which are of semi-infinite or finite dimensions, will be examined. An optimization procedure of the design of nonlinear periodic structures will be finally proposed so as to improve the band gap effects in these structures.

Keywords :

Expected collaborations :

Background required from the applicant :

Existence of a PDF file detailing the proposal ("yes" or "no") :

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