

# Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website [www-csc.utt.fr](http://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 investigating several numerical approaches for predicting the dynamic response of periodic structures and metamaterials. Wave approaches and finite element (FE) based model reduction techniques will be explored with a view to obtaining the response functions of the structures at a low computational cost. To target the analysis of 1D periodic structures - e.g., structures of finite lengths made up of complex 2D cells along a main direction -, or the analysis of 2D periodic structures of infinite extent (bi-periodic plates), the wave finite element (WFE) method will be used. On the other hand, the analysis of 2D periodic structures of finite dimensions, or assemblies of finite dimensions involving 2D periodic structures and other structural components, will be handled via appropriate FE procedures. This might include component mode synthesis techniques for modeling the cells, but also, less straightforward approaches (matrix interpolation). Disordered periodic structures involving random properties for the cells will be investigated as well. Optimization techniques of the shapes of the cells will be finally developed to improve the attenuation properties (band gaps) of periodic structures.

Keywords :

Expected collaborations :

Background required from the applicant :

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

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