

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:

Mechanical systems, non-linear dynamics, stability analysis, friction-induced vibrations, Non-linear Energy Sink, uncertainties, Chaos polynomial method, robust conception

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 :

With the tightening of the economic context, industrialists need to design mechanical systems increasingly efficient and respecting a high level of safety. In dynamic mechanical system, safety is related to the control of the uncertainties in the robust design cycle on one hand, and the ability of the system not to vibrate on the other. Recent studies on the use of nonlinear absorbers (Nonlinear Energy Sinks, NES) have shown their capabilities to mitigate vibrations. Most of the theoretical and numerical studies on this topic are dedicated to academic systems with a small number of degrees of freedom. Moreover, some experimental studies exist but industrial applications remain marginal. The robust design of such devices for industrial applications is therefore a major research issue. The main goal of the PhD work is to study and analyze the capacity of the NES to mitigate multi-instabilities in industrial mechanical systems. For that, the successful candidate will focus on two issues: -1- an investigation of the possible response regimes of a multi-unstable mechanical system coupled to several NES using numerical simulations taking into account uncertain parameters; -2- the understanding of the mitigation phenomena using mathematical analyses of the phenomenological model coupled to several NES. The expected benefits of the PhD work are a FEM demonstrator and theoretical design criteria of the NES.

Keywords :

Expected collaborations :

Background required from the applicant :

The candidate should hold an university degree (Master of Science or equivalent) in mechanics including necessarily a research internship. He/she should be comfortable with mathematical developments and program writing (programming languages as Matlab, Mathematica or Python)

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

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