

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:

Serge Dos Santos main activity is devoted to promote and develop ultrasonic techniques for both medical and industrial applications. Its activities concern medical applications of ultrasound and complex medium characterization, theoretical modelling, instrumentation and signal processing for tests, measurements and imaging of the aging and the health of complex systems (oscillators, materials, structures and biological medium).

During the 1995-2020 period, he has over 224 references: H-index 2020; 10; Number of co-authors: 56; 1 edited book; 2 book chapters; Publications in international journals: 20; 162 international conferences (24 invited)

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 :

The PhD student will be involved in the development carried out for handling a new multimodal characterization of skin and brain aging and their memory properties, within the framework of bio-mechanics and signal processing. More specifically, experimental Time Reversal (TR) based Nonlinear Elastic Wave Spectroscopy (NEWS) techniques will be developed around 40 MHz including bio-mechanical fatigue tests and correlation based image processing. Several nonlinear techniques have been developed and are continuously further defined including multi-modal acousto-mechanical approaches. The PhD student will have to contribute to the project. The project aims at developing experimental and theoretical techniques for nonlinear acoustic imaging of human brain under complex ageing processes. A transfer from techniques frequently used for nonlinear characterization of complex materials is proposed in order to evaluate biomechanical aging properties of the human media. The thesis aim at developing innovative experimentation of TR-NEWS[1] based techniques, completed with complex mechanical loading of skin model (provided by industrial partners) and ex vivo skin, in a second time. The experimental set-up will be completed by using modern ultrasonic memosducer components aim at describing neuromorphic systems and memristive devices [2].

Keywords :

Expected collaborations :

- Stevens Institute of Technology, Hoboken, USA (A. Sutin)
- ARTANN Laboratories (<http://www.artannlabs.com>), USA (A. Sarvazyan)
- Institute of Thermomechanics, Czech Republic (Z. Prevorovsky)
- Lab. of Nonlinear Dynamical Systems, Vladivostok 690041, Russia (Alexey O. Maksimov)
- Departamento de Fisica Aplicada, Universidad Politecnica de Valencia (Victor Sanchez-Morcillo)

Background required from the applicant :

We are looking for highly self-motivated candidates with a master's degree in a discipline related to wave physics (e.g., applied physics, instrumentation, electronics, acoustics, signal and image processing). Attention will be paid to academic record, motivation for the particular position, and personal projects. Autonomy, open-mindedness and motivation, as well as good English speaking/writing skills, are also expected.

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

(see guidelines on the website www-csc.utt.fr)