

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:

Pr. Lionel PETIT's research work has been focused on development of piezoelectric motors, ultrasonic devices, and energy harvesting systems. Particularly, his current research activities reports on electromechanical modeling based FEA and characterization of ferroelectric composites, which have high potential for medical applications. Dr. Minh-Quyen LE 's research interests broadly involve the areas of multiphysics coupling (electromechanics, magnetoelectrics, magnetothermics) based electroactive materials. Specially, Dr. Le's research focusses on characterization of sensor and actuator systems, and 3D/4D printing development.

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 :

Ferromagnetic composites are currently of great interest from a scientific viewpoint. Incorporation of particles, fibers or nanomaterial reinforcements into polymers permit the fabrication of polymer matrix composites with high performance or/and excellent functionality. Combining ferromagnetic particles with a polymer matrix opens the door to a large field of potential enhancements in both mechanical and magnetic properties, which is very interesting for additive manufacturing, especially when combining with 3D printing technology. Although a considerable amount of progress has been made in this field, there is still a lot of research work to be done in order to overcome various challenges remained. Three main objectives of the PhD needed to be explored: The first one focusses on elaboration of ferromagnetic composite and optimization of fabrication process, together with modeling and characterization of materials. The second issue involves in 3D printing the active composites in order to achieve smart material with desired shapes and sizes suitable for medical applications. Finally, the last year dedicates to experimental validation that should be carried out in medical environment particularly for vascular surgery. Several research directions could be investigated such as varicose veins treatment or cancer therapy based on induction heating using magnetic composite, development of low-cost magnetic sensor for 3D location of smart guidewire tip.

Keywords :

Expected collaborations :

Background required from the applicant :

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

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