

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:

Associate Professor at UTBM / FEMTO-ST (CNRS) with strong expertise in nonlinear control, system modelling, energy management and renewable energy systems, including fuel cells, Lithium batteries. H-index 46, among the top 2% of most-cited scientists in the world, according to Stanford University's ranking.

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 challenges of performance, range, safety, and sustainability in electric vehicles. Recent developments in battery architectures and powertrains aim to increase power density, reduce charging times, and improve the vehicle's overall energy efficiency. However, this increase in power, especially under heavy load or during fast charging, leads to greater heat generation in the battery cells and modules.

Thermal management is therefore a critical aspect of Lithium battery operation. Excessive temperatures, high thermal gradients, or poorly controlled operating conditions can accelerate cell aging, reduce available capacity, degrade vehicle performance, and, in some cases, compromise system safety. Conversely, a battery operating at low temperatures may have limited power, reduced efficiency, and experience increased stress during charging. To ensure the safety, performance, and lifespan of electric vehicles, it is therefore essential to maintain the battery within an optimal temperature range.

Recent research highlights, in this context, the value of integrated energy and thermal management strategies. These approaches aim to coordinate the management of electrical and thermal flows to simultaneously optimize battery range, energy efficiency, operating temperature, and aging. Predictive methods, particularly model predictive control (MPC),

Keywords :

Expected collaborations :

Background required from the applicant :

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

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