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 : DUBAR Given names : Laurent

Status (prof., assistant prof., …) : Professor

Laboratory : LAMIH UMR 8201 CNRS Website address : https://www.uphf.fr/LAMIH/en

Institution : INSA Hauts-de-France Website address : https://www.insa-hdf.fr

Scientific competence of the supervisor:

Metal Forming, Tribology, Friction, Wear, Lubrication, Optimization;

Two major publications in the field proposed for the PhD :

1. Boungomba, H., Moreau, P., Sadat, T., Lilensten, L., Dubar, M., & Dubar, L. (2024). Investigation of the impact of AISI D2 tool steel wear and lubrication type on the evolution of the friction coefficient during cold winding
2. Dubar, M., Boualem, N., Moreau, P., La Barbera-Sosa, J. G., Sadat, T., Dubois, R., ... & Bristiel, P. (2025). Multi-scale approach to high-temperature impact of oxides and worn geometries on tribological behaviour at

Website address of the personal page : https://scholar.google.fr/citations?user=bZPsGrgAAAAJ&hl=fr

Supervisor's email : laurent.dubar@uphf.fr

Description of the research work proposed for a PhD ***Topic # (see list) :*** IV-6,IV-8

Title : Developpement of multi-physiques model to simulate the wear phenomena by integrating the microstructural properties

Subject :

Wear is a complex material degradation phenomenon resulting from the interaction of mechanical, thermal, and tribological processes. Its evolution is strongly influenced by microstructural features, which are not sufficiently considered in many conventional predictive approaches. This research proposes the development of a multiphysics model to simulate wear phenomena by integrating microstructural properties into the modeling framework. The study will investigate how parameters such as grain size, phase composition, hardness distribution, porosity, and interface behavior affect local stress concentration, frictional heating, damage accumulation, and material loss. A coupled numerical approach will be established to describe the relationship between microstructure and wear evolution under different loading and contact conditions. Experimental observations will support model calibration and validation. The proposed model is expected to enhance the understanding of wear mechanisms and provide a reliable predictive tool for material design, component optimization, and lifetime assessment in demanding engineering applications.

Keywords :

Metal forming; Numerical simulation; Wear; Optimisation.

Expected collaborations :

The candidate will work in close collaboration with local experts in materials science, surface engineering, and numerical modelling.

Background required from the applicant :

Expected candidate should have basic knowledge of metal forming, microstructure, finite element modeling and basics of programming.

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

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