

## POST-DOC Position available in Nancy (France)

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**Research Co-Director:** Dr. Alexis Aubry, CRAN, ([Alexis.Aubry@univ-lorraine.fr](mailto:Alexis.Aubry@univ-lorraine.fr))

**Laboratory:** Centre de Recherche en Automatique de Nancy, CRAN UMR 7039, University of Lorraine, CNRS / Fédération Charles Hermite

**Place:** Scientific Campus, Vandoeuvre-les-Nancy, France

**Title:** Semantic interoperability in a software platform for sustainable energy and environment efficiency

**Context:** This post-doc position is funded by the national project ANR "Plate-Form(E)3". This project deals with the development of a software platform for the computing and the optimisation of the energetic and environmental efficiency for industry and territories. Its aim is the integration of dynamical, thermic and material perspectives when analysing sustainability of any processes. This post-doc position aims at studying the semantic interoperability issues between specialised tools that must be integrated in this platform. These tools concern the simulation/optimisation of the processes (commercial software such as Aspen, Pro II, ProSim ..., or open-source software such as CERES-2). In particular, the models and the single features implemented in these software tools must be analysed in order to produce a formal pivotal model enable to make them interoperable. We can identify two major issues: first the semantic modelling of ubiquitous information linked to simulation and optimisation software for the energetic efficiency, and second the necessity of taking into account the different domains imposed by the usage of this platform.

**Job description:** For facing the integration of piece of software, some normative solutions, proposed by standardisation initiatives, exist but only at the syntactic level. Here, the main issue concerns the formalization of the semantic models that are implicitly embedded in the different tools. These models are dependant of the concerned features. An interoperable model must then be proposed for specifying the software interfaces that are necessary for the interoperation of these tools.

After a state-of-the-art on tools, methodologies and software that could be integrated in the platform, the different embedded information models and their semantics will be studied for identifying and assessing their degree of heterogeneity. The candidate will then build, for each pair of tools, an interoperability map taking into account their potential interoperability issues.

This research proposal, involving both theoretical and applied research, is strongly related with the research focused on interoperability of heterogeneous distributed systems studied in many research networks and organisations around the world.

**Candidate profile:** A Ph.D. thesis in Computer Science or in Computer Engineering is required. The candidate to this Post-Doctoral position must have knowledge in information systems modelling (using languages such as UML) and formal semantics modelling.

**How to apply?:** Please send your CV and a cover letter by e-mail to: [alexis.aubry@univ-lorraine.fr](mailto:alexis.aubry@univ-lorraine.fr) before January 1<sup>st</sup> 2013. The final selection will be decided on January 15<sup>th</sup>. We expect this Post-Doc position to start on February 1<sup>st</sup>, 2013. For more information about the CRAN laboratory, you can look at [www.cran.uhp-nancy.fr/anglais](http://www.cran.uhp-nancy.fr/anglais). Employer: University of Lorraine, duration: 6 months fixed-term. The 6-month net salary is: 11 000 Euro. Working language is English.