### Description of the research work proposed for a PhD

**Title:** Knowledge Capitalization in Inventive Design Studies  

**Subject:**  
This thesis is in the continuation of another thesis that has been held in INSA de Strasbourg between 2010 and 2013 about the modelling of problem formulation and problem solving in TRIZ (Theory for Inventive Problem Solving). The results of these works include an "intelligent" knowledge manager that assists the TRIZ expert in his using of the methodology. This knowledge manager is able to consider the input parameters of a new TRIZ study and to propose different concept solutions to the expert. It also keeps tracks of all the studies that have been done, with all the pertinent information about them.  
During these new research works, we will focus on the capitalization of the studies previously done by the TRIZ expert. The candidate will need, therefore, to explore different approaches to knowledge capitalization, for example, Case-Based Reasoning (CBR) or Set of Experience Knowledge Structure (SOEKS) and decisional DNA (DDNA) and make a concrete proposal of decisional knowledge formalization in the framework of this project. Previously obtained concept solutions need to be proposed to the TRIZ user when relevant and if they are "better" that the concept solutions obtained.

**Keywords:** artificial intelligence, knowledge bases, inventive design, ontologies, knowledge capitalization

**Expected collaborations:**  
This project is related to existing collaborations with EADS, ALSTOM, ARCELOR-MITTAL.

### Background required from the applicant

This subject is suitable for students that are interested in Knowledge Management. He(she) should be an Industrial or Computer Science Engineer. The required competences include: excellent team work capabilities, excellent written and spoken English, very good knowledge on development of applications in JAVA/J2EE, CVS, Eclipse or Netbeans, UML. Experience in the development of ontologies would be more than welcome.

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

(see guidelines on the website [www-csc.utt.fr](http://www-csc.utt.fr))