PhD Grant at CRIL (Lens, France)

Parallelization of Constraint Solvers

Proposal

Constraint Programming (CP) is a general framework providing efficient models and algorithms to solve combinatorial problems. With the generalization of multicore hardware and cloud computing, constraint programming researchers have a real opportunity to improve constraint solvers by several orders of magnitude. The main goal of this thesis is to design and develop new parallel solvers for both CSP and SAT problems, either on multicore architecture or on the cloud. Both parallelization of search with multithread programming and portfolio approaches will be explored in this thesis.

This thesis is a contribution to the industrial PAJERO project which aims at solving large, concrete problems as efficiently as possible on the cloud.

Laboratory

The CRIL (Centre de Recherche en Informatique de Lens - Lens Computer Science Research Centre) is a research lab affiliated with the University of Artois and with the CNRS (as UMR 8188), the French national research centre. The research activities at CRIL are centered around symbolic Artificial Intelligence (AI) and its applications. Constraint Programming (CSP, SAT, ...), which is at the core of this proposal, is a topic of high interest at CRIL.

The PhD will take place in the context of a project ISI (Industrial Strategic Innovation) supported by the french institution OSEO. This project gathers three companies as well as two other laboratories. The PhD student will benefit from a full-time grant during a period of three years. The position is based at CRIL (University of Artois, Lens, France). The student will have access to all lab resources, namely, personal computers, cluster computing, library subscription, etc.

Application

The candidate should have an outstanding degree in computer science (a perfect knowledge of object-oriented programming with a language such as Java and C++ is required - a good knowledge of Unix/Linux is appreciated), and a solid background in artificial intelligence and algorithms. A first experience in research is highly recommended. Prior knowledge of french is not mandatory.

Every applicant must submit in a zip file a CV, a copy of his university degrees, a list of publications if any, and a covering letter by email to `{audemard,lecoutre,roussel}@cril.fr` with the following subject: Pajero:Parallelization. Selected candidates are expected to come for an interview in the lab or by visio-conference. Interviews will start in June 2011 and continue until a suitable candidate has been found.