Market based mechanisms for optimization
(Master thesis)

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1 Problem description

There are different ways of solving distributed decision and coordination problems. One can model the problem as a constraint satisfaction/optimization problem (DCOP) and use complete like DPOP or ADOPT, or incomplete methods like distributed local search to solve these problems. Equally well you could use agent based negotiation protocols to solve your problems at hand. Little or no research, however, has been done in the effectiveness of market based mechanisms to solve such problems.

In this project, the student will perform a small literary study on the use of market based mechanisms to solve decision problems, adapt an existing mechanism or come up with a mechanism and then compare the performance of such a mechanism with both complete and incomplete DCOP solvers.

2 Task

This project consists of the following tasks

- do a small literary study on market base mechanisms
- implement a market based mechanism (either from the literature or your own) using the FRODO platform
- compare this mechanism to complete and incomplete mechanisms using the FRODO platform

3 Tools

The student is to use the java based FRODO platform in implementing the mechanism. The platform already contains implementations of some of the state of the art DCOP algorithms that can be used in the comparison.
4  Skills

The student should have a good knowledge of java.