Title:
Coordination mechanisms for web-service selection and composition.

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Description:
This master thesis will study Agent Coordination Mechanisms, specially adding global constraints to them.

Context/Goal/Details:
Agent Coordination Mechanisms have been studied and applied to solve problems in a variety of domains. These mechanisms are specially helpful on domains that have high dynamics and that centralized solutions are infeasible, such as large scale problems. Such problems include service selection on the internet for instance. Multi-agent systems provide concepts and mechanisms that can support building decentralized solutions. Agents represent distributed, autonomous entities, which need to cooperate in order to obtain the system objectives.

This master thesis will focus on the service selection problem. Given that there are many services capable of performing some operations, how to select them, guaranteeing global properties, and achieve the system goals. Which coordination mechanisms perform well in the service selection setting?

Two coordination mechanisms will be selected and extended to work with global constraints, such as the total time to execute the tasks, or total time to select a service to perform a certain task. These mechanisms will be compared to check which one provides the best service allocation satisfying the defined constraints. The simulation scenarios will be chosen together with the adviser.

The student will implement the chosen coordination mechanisms using the CASAS middleware, which provides hooks to work with coordination mechanisms to adapt web-services. This middleware abstracts the coordination mechanisms from the underlying web-services technology.

Literature study: 25%
Design/implementation: 45%
Simulation experiments/evaluation: 30%

References
- An Introduction to MultiAgent Systems (2nd ed), Michael Wooldridge, 2009

Remark
We are looking for highly motivated students with a good knowledge of object-oriented design and programming (Java). Having knowledge of MAS is not strictly mandatory. If you are interested in this thesis, we invite you to contact us for an informal chat on the subject.