EDITORIAL MESSAGE

Special Track on Agent-Oriented Programming, Systems, Languages, and Applications (APSLA)

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The requirements of distributed software systems become increasingly complex. Among the aspects that characterize such a complexity are the inherent distribution of resources and activity - that makes global control practically infeasible and emphasizes the need for decentralized control - and the highly dynamic and changing operating conditions in which today's distributed applications operate - that calls for open and adaptive software.

In the early 1990s, multi-agent systems were put forward as a promising paradigm for modeling and engineering complex distributed systems. Agents provide engineers with a higher level of abstraction enabling a natural step in software engineering next to the object-oriented paradigm. Over the years, multi-agent system research has developed a large body of knowledge on foundations and engineering principles for designing and developing complex distributed systems. Despite the enormous research efforts and a number of successful industrial applications, the state of the art in multi-agent system research and engineering is insufficiently reflected in state of the practice in complex distributed systems.

The APSLA track aims at investigating how the multi-agent system paradigm can contribute to the engineering of complex systems and applications. The track aims at exploring the aspects of multi-agent systems that are relevant in building complex distributed software systems. The particular focus of the track is on the following concerns:

- Decentralized control: How to engineer a decentralized solution consisting of a population of agents?
- Open systems: How to leverage agents dynamically to enter and leave the system?
- Adaptive systems: How to engineer self-adapting and self-organizing systems? How to provide guarantees about the global behavior of systems that consists of interacting autonomous entities?
- Model of concurrency in MAS: How can the agent abstraction contribute to improve current practice in managing concurrency in complex distributed systems?

APSLA attracted twenty-five submissions. All submissions passed a rigorous review process and finally four submissions were accepted as full papers and two other submissions were accepted as posters.

In “Profile Based Comparative Analysis for AOSE Methodologies Evaluation”, Luca Cernuzzi and colleagues propose the adoption of the Profile Analysis method to evaluate and compare agent-oriented methodologies. The application of such analysis method appears to improve the reliability of the evaluations of AOSE methodologies, and may help in the selection of a specific methodology with a specific level of

congruency with regards to an expected profile, being it general or limited to a particular dimension. MaSE and Tropos are considered as specific case studies.

Gilberto Cysneiros and Andrea Zisman describe in “Traceability and Completeness Checking for Agent-Oriented Systems” a rule-based approach to support automatic traceability and completeness checking of design models and code specification of agent-oriented systems. In particular, the authors present a prototype tool generating different types of traceability relations and identifying missing elements between artifacts represented in Prometheus design models and JACK code specification. The approach is validated with a case study on an electronic bookstore.

In “Contextualizing Normative Open Multi-Agent Systems”, Carolina Howard Felicissimo and colleagues propose a mechanism for norm composition and enforcement in multi-agent systems. The mechanism combines norms derived by various contexts, such as the organization the agent belongs to and the role the agent plays. Obtained composite norms are then enforced by making use of other tools that monitor action execution or message exchange.

In “Dynamic Resource Allocation Heuristics for Providing Fault Tolerance in Multi-Agent Systems”, Alessandro de Luna Almeida and colleagues discuss the problem of resource allocation to replications for fault tolerance. The authors introduce specific elements for multi-agent systems that affect criticality of agents such as roles, norms, etc. In addition, heuristic algorithms are proposed and evaluated for resource allocation involving criticality of agents.

Isabel Praça and colleagues pertain to the particular domain of electricity markets in “A Multi-Agent System for the support of Producer Coalition formation in Electricity Markets”. The profile of such markets is evolving under ecology and sustainability concerns toward a growing number of producers with low individual productivity. The authors propose an approach based on multi-agent simulations that help in analyzing coalition formations algorithms. The paper refers to the MASCEM simulation tool designed by the authors, and to early analysis of coalition issues.

In “Local computations for Mobile Agents A Case Study: The Rendezvous Problem”, Haddar Med Amine and colleagues formalize and illustrate the rendezvous problem with local computations only, thus providing an alternative to message-passing algorithms. Two strategies are presented to solve the problem in ring and graph network topologies, together with formal proofs of correctness and termination of the proposed solutions.

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APSLA 2008 website: <http://apsla.ex.nii.ac.jp/>