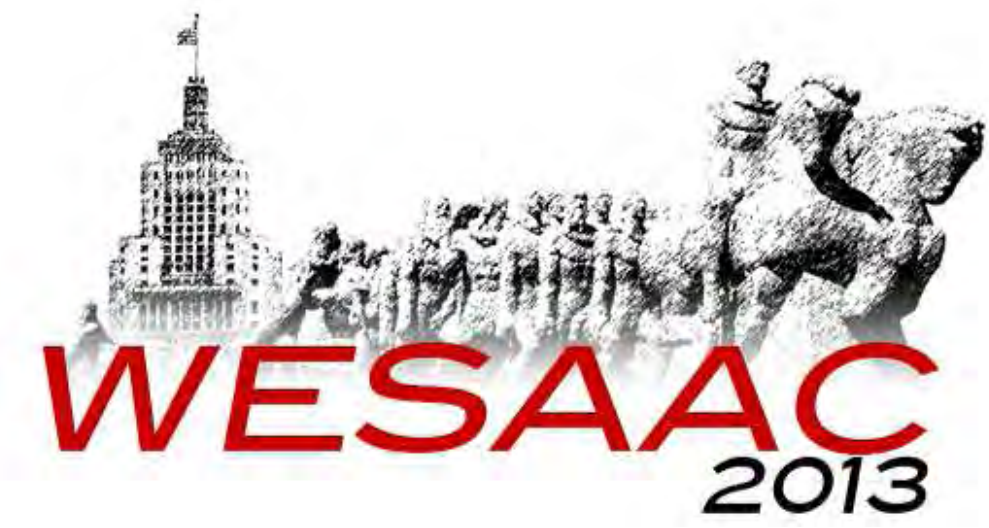

Anais do
VII Workshop-Escola de Sistemas de Agentes, seus Ambientes e apliCações

— WESAAC 2013 —

Organizado por

Anarosa Alves Franco Brandão
Rafael Heitor Bordini
Jaime Simão Sichman

São Paulo, 26-29 Maio de 2013

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Prefácio

Este documento contém os trabalhos apresentados na sétima edição do WESAAC (Workshop-Escola de Sistemas de Agentes, seus Ambientes e apliCações). O WESAAC 2013 foi realizado na cidade de São Paulo - SP, nas dependências da Universidade de São Paulo (USP), entre os dias 26 e 29 de maio de 2013, com o apoio da Escola Politécnica, do Instituto de Matemática e Estatística e do Centro de Computação Eletrônica da Universidade de São Paulo, da Sociedade Brasileira da Computação (SBC) e do Centro de Cultura Judaica de São Paulo.

Continuando a tradição da série WESAAC, os objetivos do evento continuam relacionados à integração de pesquisadores e estudantes de todos os níveis na área de Agentes e Sistemas de Agentes e divulgação das atividades de pesquisa dos diversos grupos de pesquisa do Brasil, com o intuito de facilitar o intercâmbio de conhecimentos. Para isso, o evento é constituído de uma combinação de Oficinas e Palestras (a parte "escola"), proferidas por pesquisadores experientes, e apresentações de Trabalhos Completos e Resumos Estendidos (a parte "workshop").

O histórico deste evento, que inicialmente foi denominado "Workshop - Escola de Sistemas de Agentes para Ambientes Colaborativos" e, a partir de sua quarta edição passou a ter a denominação atual, mostra o crescimento constante da comunidade de pesquisadores na área de agentes e sistemas baseados em agentes no Brasil. As três primeiras edições do evento tiveram uma abrangência regional, atingindo especialmente pesquisadores da região Sul do Brasil. A partir da quarta edição, realizada na cidade do Rio Grande - RS, aumentou-se o escopo do evento, ampliando sua abrangência de regional para nacional.

Nesta sétima edição do WESAAC, mantivemos a abrangência nacional, e ampliamos a participação internacional de pesquisadores destacados da área de sistemas de agentes, oriundos da Université Pierre et Marie Curie (UPMC)-França, da Université de Toulouse, França, da University of Otago, Nova Zelândia, e da Bar Ilan University, Israel. Além disso, também convidamos pesquisadores da indústria, notadamente a IBM.

Para esta edição, o evento recebeu uma variedade de contribuições. Foram submetidos 42 artigos, sendo 21 artigos completos e 21 artigos resumidos. Dentre os artigos completos, 13 foram aceitos para apresentação oral, divididas em três sessões técnicas, e 8 foram aceitos para apresentação na forma de poster. Dos artigos resumidos, 16 foram aceitos para apresentação como poster. Todos os artigos aceitos constam deste documento.

Gostaríamos de agradecer aos palestrantes convidados, Onn Shehory, Amal El Fallah Seghrouchni e Ana Bazzan que abrilhantaram o evento com suas palestras. Também agradecemos aos ministrantes de oficinas: Michael Winikoff, Fred Amblard, Amal El Fallah Seghrouchni, Jomi Fred Hubner e Sara Casare. Finalmente, agradecemos a todos os pesquisadores que submeteram os seus artigos, assim como aos membros do comitê de programa, aos revisores adicionais pelo criterioso trabalho desenvolvido e às nossas instituições (USP e PUC-RS). Um agradecimento especial às agências FAPESP, CAPES e CNPq, pelo fomento recebido e ao CCE-USP e ANSP,que tornaram possível o WESAAC 2013.

São Paulo, Maio, 2013
Anarosa Alves Franco Brandão
Rafael Heitor Bordini
Jaime Simão Sichman

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Sumário

IV Short Papers - Resumos estendidos

Parte I

Invited Speakers - Palestras Convidadas

On agent collaboration, games and coalitions

Onn Shehory
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***Abstract*—Agents in the context of others typically have to interact and collaborate to meet their goals. Agent collaboration calls for mechanisms from game theory and relaxation thereof. Multiple games have been considered to facilitate collaboration, and many mechanisms have been devised. Yet it appears that the most widely studied class of games and mechanisms surround coalition and team formation. Within coalitions, agents may jointly perform tasks that they would otherwise be unable to perform, or will perform poorly. To allow agent collaboration via coalitions, one should devise a coalition formation mechanism that exhibit desirable properties such as stability, fairness, optimality, and computational tractability. In this talk we will present agent attributes which affect interaction, games which facilitate interaction, and mechanism which implement feasible solutions to such games. Part of talk will focus on coalition formation mechanisms.**

Keywords—agents; collaboration; coalitions; games

Coordination in multi-agent systems: dimensions and mechanisms

Amal El Fallah Seghrouchni
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***Abstract*—A multiagent system (MAS) is populated by multiple autonomous agents that interact to solve complex tasks, to enhance the system's overall utility while improving their individual performance. Hence, coordinating the behaviors of multiple agents acting in the same environment is an important issue in the multi-agent systems domain. This talk will address the MAS coordination as a process by which, a system of agents are lead to work together harmoniously. It will present the several dimensions of coordination as well as the main mechanisms developed in MAS field, in particular for cognitive agents.**

Keywords—multiagent systems; coordination; cognitive agents

Agents and Traffic Simulation

Ana Bazzan
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***Abstract*—This talk addresses the following points: i) problems related to the increasing demand for mobility in modern society; ii) four facets of intelligent transport and traffic systems: modeling and simulation, advanced travelers' information systems (ATIS), management, traffic control and optimization, and new technologies (autonomous vehicles and automation of infra-structure); iii) how agents can contribute to make cities smarter; iv) current work and recent results of the multi-agent systems group at the computer science institute at UFRGS.**

Keywords—traffic simulation, advanced traveler´s information systems

Parte II

Short Courses - Oficinas

Coordination of Complex Systems based on Multi-Agent Planning

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***Abstract*—Handling and the coordination of plans for the achievement of different goals is an important issue of planning, in particular when several agents (robots) are mobile within a shared and dynamic environment. This lecture will present an overview of planning technics and coordination mechanisms developed for multi-agent systems. Then, it will present some significant approaches we have developed for the coordination of temporal multi-agent plans. We present a first framework based on hybrid automata to represent and handle temporal plans of agents. The coordination of such plans and their synchronization within a multi-agent plan will be discussed and illustrated in the context of aircraft simulation. Then, we introduce a second framework where coordination mechanisms have been established to deal with temporal plans of different priorities. This framework will be illustrated on two scenarios : a Proactive-Reactive Coordination Problem (PRCP) where an agent has to modify its temporal plan in order to remove any conflicts with the plan of another agent having higher priority ; and a Coordinated Planning Problem (CPP), where an agent has to compute a plan for the achievement of its own goals, but without violating the constraints of another agent's higher priority plan and utilizing where possible the cooperative opportunities offered by the latter.**

Keywords—multiagent systems; coordination; cognitive agents; planning

Agent-Oriented Software Engineering: Current State and Future Directions

Michael Winikoff
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***Abstract*—The field of Agent-Oriented Software Engineering (AOSE) is concerned with the engineering aspects of developing agent-based systems, and how to support their development. Specifically, work in AOSE aims to provide practitioners with methodologies for the design of agent systems, and with supporting tools. A methodology can be seen as defining an overall process, where design artifacts (``models'') are used to capture key outcomes of the process. These design artifacts are expressed using one or more notations (which may be more or less formally defined). It is important that a methodology provide detailed usable guidelines for how to carry out key steps. For example, if a methodology says that the second step in the overall process is to identify the goals of the system, then this is not much use to the designer without some indication of the sorts of techniques that could be used to identify the goals. Work in the field varies in its focus: some papers take a higher-level view and describe whole methodologies, whereas others focus on a particular part or aspect of the software development process, for example, extending the modeling notation to better represent organizational aspects, or providing techniques for testing agent systems. This short-course will briefly review the history of AOSE, and then survey where the field of AOSE stands. Finally, the future of the field will be discussed: what are key directions and challenges for AOSE?**

Keywords*—*agent-oriented software engineering, survey

Modelling social influence among agents

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***Abstract*—In this course, I will first present different social phenomena that could be describe as typical cases of social influence (opinion dynamics, culture formation, attitude dynamics…). Hereafter, I will present partly the theoretical ground of these phenomena mostly from social psychology. I will then present different simple models that enable to capture and render those dynamics. I will end this course on the particular role played but social networks in such a context, where they are at the same time the support of social influence among agents (I adopt the attitude of my friends) and also an effect of such social influence (I tend to become friend with people sharing the same attitude)**

Keywords—social simulation; modeling

Building AOSE Situational Methods Using Method Fragments

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Abstract*—Multi-Agent Systems (MAS) provide a new paradigm for conceptualizing, designing, and implementing software systems, ranging from manufacturing to process control, air traffic control, and information management. They are particularly attractive for creating software that operates in distributed and open environments, such as the Internet, and which simulates scenarios that serve as basis to create public policies and strategies to deal with complex problems, such as rescue after natural disasters and evacuation of public facilities. Nevertheless, in order to be adopted by the software industry, a controlled and disciplined way to conduct software development projects related to the aforementioned domains is needed. Despite the research community efforts while proposing methods for structuring and guiding the development of MAS, AOSE methods are still at an early stage, mainly being applied in the context of academic projects. Moreover, the development of complex systems using MAS requires specific methods and then the use of Situational Method Engineering techniques for MAS seems to be a promising solution for it. Thus, considering the class of problems whose solutions are tailored for adopting the MAS paradigm and which depends on organization and coordination, it could be benefited by using an organization-centered approach, through the adoption of some organizational model for MAS combined with some agent (or multiagent)-based software development method. Currently, a project team that looks for a disciplined way to develop a MAS application involving such organizational characteristics will not find a method ready to be used. An example of such a real application could be an information system to support the adoption of strategies for evacuating huge facilities under bomb threats. In this minicourse we will address such problems, by introducing a process for building methods out of reusable parts of methods - the so-called method fragments - to support the development of organizational-centered MAS. At the end of the tutorial, its audience must be able to build MAS situational methods for such a class of problems. Also, they will be encouraged to use the process to build MAS situational methods tailored to other classes of problems as well

Keywords— multiagent systems; agent-oriented software engineering; situational method engineering

Programming Multiagent Systems

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***Abstract*—In this course we will give a survey about agent-oriented programming and show how this paradigm was combined with organization-oriented programming and environment-oriented programming to yield multiagent programming. It will focus in a particular platform called JaCaMO, an integration of the platforms Jason (for agent-oriented programming), Cartago (for environment-oriented programming) and MOISE (for organization-oriented programming). It includes a hands on session in a lab.**

Keywords— multiagent systems; multiagent programming