



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

— WESAAC 2013 —

Organizado por

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São Paulo, 26-29 Maio de 2013

Workshop-Escola de Sistemas de Agentes, seus Ambientes e aplicações —
VII WESAAC / Brandão, A.A.F.; Bordini, R.H.; Sichman, J.S.; (Org).
ANAIS.— — São Paulo, 2013.

207p. :il.

ISSN 2177-2096

1. Agentes Inteligentes. 2. Sistemas de Agentes de Software. 3. Ambientes
para Agentes. 4. Aplicações de Agentes. I. Brandão, A.A.F. II. Bordini, R.H.
III. Sichman, J.S.

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”), preferidas 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.

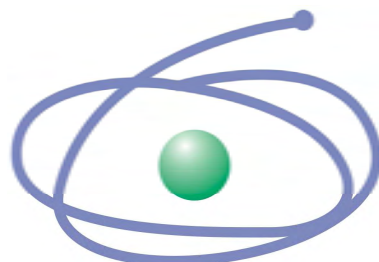
Nesta sétima edição do WESAAC, mantivemos a abrangência nacional, e ampliamos a participação internacional de pesquisadores destacados da área de sistemas de agentes, oriundos da Université Pierre et Marie Curie (UPMC)-França, da Université de Toulouse, França, da University of Otago, Nova Zelândia, 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
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Sumário

I Invited Speakers - Palestras Convidadas

On agent collaboration, games and coalitions	3
<i>Onn Shehory</i>	
Coordination in multi-agent systems: dimensions and mechanisms	5
<i>Amal El Fallah Seghrouchni</i>	
Agents and Traffic Simulation	7
<i>Ana Bazzan</i>	

II Short Courses - Oficinas

Coordination of Complex Systems based on Multi-Agent Planning	11
<i>Amal El Fallah Seghrouchni</i>	
Agent-Oriented Software Engineering: Current State and Future Directions	13
<i>Michael Winikoff</i>	
Modelling social influence among agents	15
<i>Fred Amblard</i>	
Uma introdução a engenharia de métodos situacionais para SMA	17
<i>Sara Casare</i>	
Programação orientada a Multiagentes	19
<i>Jomi Fred Hubner</i>	

III Full Papers - Artigos Completos

A Language to Specify the Interaction Considering Agents, Environment, and Organization	23
<i>Maicon Rafael Zатели and Jomi Fred Hubner</i>	
Extending deontic interpreted systems with action logic	29
<i>Raquel Barbosa and Antonio Carlos da Rocha Costa</i>	
Application of Workflow in Multi-Agent System Organization	35
<i>José Neri, Carlos Santos and Jomi Hubner</i>	
A Normative and Self-Organizing Piloting Model for Virtual Network Management	41
<i>Carolina Valadares, Manoel Netto and Carlos Lucena</i>	
A Multiagent System for Urban Traffic Control	47
<i>Antonio de Abreu Batista Jr and Luciano Reis Coutinho</i>	
Multiagent systems to search and contracting Tourism services	53
<i>João Ferreira de Santanna Filho, Scheila Nair Costa, Camila Pontes Brito Da Costa, Charbel Szymanski and João Eduardo Hornburg</i>	
A multiagent approach for detecting and mitigating DDoS attacks	61
<i>João Pereira, Marcos Simplicio Jr and Anarosa A. F. Brandão</i>	

A BDI-Fuzzy Agent Model for exchanges of non-economic services based on the social Exchange theory	67
<i>Giovani Farias, Graçaliz Pereira Dimuro and Glenda Dimuro</i>	
Integrating CartAgO Artifacts for the Simulation of the Social Production and Management of Urban Ecosystems: the case of San Jerónimo Vegetable Garden of Seville, Spain	73
<i>Flávia Cardoso Pereira dos Santos, Henrique Donâncio Rodrigues, Thiago Fredes Rodrigues, Glenda Dimuro, Diana Adamatti, Graçaliz Pereira Dimuro and Esteban de Manuel Jerez</i>	
A MAS for the Simulation of Normative Policies of the Urban Vegetable Garden of San Jerónimo, Seville, Spain	79
<i>Henrique Rodrigues, Iverton Santos, Glenda Dimuro, Graçaliz Dimuro, Diana Adamatti and Esteban Jerez</i>	
TrustE - An Emotional Trust Model for Agents	85
<i>Guilherme Klein da Silva Bitencourt, Ricardo Azambuja Silveira and Jerusa Marchi</i>	
Using the JaCaMo framework to develop a SMA for the MAPC 2012 Agents on Mars scenario	91
<i>Mariana Ramos Franco and Jaime Simão Sichman</i>	
An Experiment of Verification of Multi-agent Robotic Soccer Plans with Model Checking	97
<i>Rui C. Botelho A. S., Aline M. S. Andrade, Frederico Barboza and Augusto Loureiro da Costa</i>	

IV Short Papers - Resumos estendidos

Organizational Modelling of a Multiagent System based in a Theater Play	105
<i>Tatiane Dobrzanski, Gleifer Vaz Alves and Antônio Carlos da Rocha Costa</i>	
Modeling Software Project Management with Norms and Reputation	109
<i>Davy Baía, Elder Cirilo and Carlos Lucena</i>	
Integrating the Organizational Model Moise+ to a Cognitive Agent Architecture applied to Robocup Simulator 2D	113
<i>Eder Mateus Gonçalves and Mateus Fogaça</i>	
Behavior Editor for Agents Based on Service Oriented Architecture	117
<i>Saulo Popov Zambiasi and Ricardo J. Rabelo</i>	
Model Oriented Approach to Code Generation for Normative Multi-Agent Systems	121
<i>Robert Rocha Júnior, Emmanuel Sávio Silva Freire and Mariela Inés Cortés</i>	
Development of a communication mechanism between Pedagogical Agents in a Virtual Learning Environment	125
<i>Geovane Griesang, Rejane Frozza, Rolf Fredi Molz, Gilberto Dessbesell Jr and Rafael Pieter</i>	
Collection Module Data to Support Pedagogical Agent Affective	129
<i>Marcus Rosa and Andrea Konzen</i>	
Animated pedagogical agent as learning companion	133
<i>Letícia Couto, Jun H. Silva, Carla A. Barvinski and Valguima. V. V. A. Odakura</i>	

Dynamic Modeling of Multi-Agent Systems Using MAS-ML Tool	137
<i>Francisco Lima, Állan Feijó, Robert Rocha, Igor Nogueira, Enyo Gonçalves, Emmanuel Sávio Freire and Mariela Cortés</i>	
Two Different Perspectives about How to Specify and Implement Multiagent Systems	141
<i>Andre Mendes Da Rosa, Alexander Gularte, Eder Mateus Nunes Gonçalves and Mateus Jung</i>	
Multiagent Systems in Travel Planning	145
<i>Diego Fialho Rodrigues, Heber Amaral, Simone Costa and Alcione Oliveira</i>	
Towards a fault model for BDI agents: an initial study	149
<i>Francisco Cunha, Elder Cirilo and Carlos Lucena</i>	
Simulating Consumers Energy Profiles through Multiagent Systems	153
<i>Fernanda Mota, Vagner Rosa, Silvia Botelho and Graçaliz Dimuro</i>	
Multiagent Systems Simulation of Dengue in Minas Gerais (Brazil)	157
<i>Katia Cristina Aparecida Damaceno Borges, Willian Magno Pereira Reis and Alcione De Paiva Oliveira</i>	
Use of HPC in Agent-Based Social Simulation: A Case Study on Trust-Based Coalition Formation	161
<i>Luciano Rosset, Luis Nardin and Jaime Sichman</i>	
Using Interest Management to Improve Load Balancing in Distributed Simulations	165
<i>Felipe C. Bacelar, Carlos J. P. Lucena and Pierre Bommel</i>	
Simulation and Analysis of Malaria Using Multiagent Systems	169
<i>Laurence Marcos Costa and Diana Francisca Adamatti</i>	
Agent-Based Simulation to a Decision Support System to Pollutant Dispersion ...	173
<i>Narúsci Bastos and Diana Francisca Adamatti</i>	
A Brownian Agent approach for modeling and simulating the population dynamics of the schistosomiasis contagion	177
<i>Renato Luciano Cagnin, Ivan Rizzo Guilherme, Alexandro José Baldassin and Filipe Marcel Fernandes Gonçalves</i>	
Self-Regulation of Social Exchange Processes in MAS: a cultural and evolutionary BDI agent society model	181
<i>Andressa von Laer, Graçaliz Dimuro and Marilton Aguiar</i>	
In-silico Simulation of Indoor Panic Situations using Reactive Agents	185
<i>Giorgio Torres, Willian Farago and Alcione Oliveira</i>	
Using Agent Coordination Techniques to Support Rescue Operations in Urban Disaster Environments	189
<i>Alan D. Barroso, Felipe De C. Santana, Victor Lassance, Luis Gustavo Nardin, Anarosa A. F. Brandão and Jaime S. Sichman.</i>	
Using DCOP to Model Resource Allocation: A Review of Algorithms	193
<i>Alexander Gularte and Diana Adamatti</i>	
Authors Index - Índice de Autores	197

Parte I

**Invited Speakers - Palestras
Convidadas**

On agent collaboration, games and coalitions

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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

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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

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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

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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*