

2008 SIWN Congress, Glasgow, UK, 22-24 July 2008

<http://siwn.org.uk/2008/>

Program

	22 July 08		23 July 08		24 July 08	
Time \ Room	CPD02	CPD03	CPD02	CPD03	CPD02	CPD03
09:00-10:30	Keynote #1	--	Keynote #2	--	Keynote #4	--
10:30-10:45	Coffee Break					
10:45-12:15	BSPC (1) (SACC & NIMC)	AOSDM (BSPC)	NIMC (1)	ABS (1)	SACC (1)	SACC (2)
12:15-13:45	Lunch					
13:45-15:15	BSPC (2) (CODS & IISE)	BSPC (3) (ABS) IISE (1)	Keynote #3	--	Panel Discussion	--
15:15-15:30	Coffee Break					
15:30-17:00	BSBAL (BSPC)	IISE (2)	NIMC (2) ABS (2)	CODS (1)	CODS (2) ABS (3)	SACC (3)
	17:30-20:00 Reception & BSPC Awards		18:00-22:00 Dinner			

Notes:

- Each talk at parallel session is scheduled 20 minutes for author's presentation, to be followed by 10 minutes questions and discussions.
- Conference venue: Floor 1 of CPD Building (Continuing Professional Development), city campus, Glasgow Caledonian University, Cowcaddens Road, Glasgow, G4 0BA, Scotland, United Kingdom.
- The hotel, Park Inn, is just on the other side of the road to the campus.
- Lunches, reception, and dinner are in the hotel Park Inn.
- The registration desk will be opened between 17:00-19:00 p.m. on Monday 21st July 2008 in the lobby of the hotel Park Inn.

Keynote #1

Title: Towards an Ubiquitous Pragmatic Web

Session Chair: Hans Czap

Invited Speaker:

Dr. Adrian Paschke

Director RuleML Inc., Fredericton, New Brunswick, Canada
and

Biotec Center, Tatzberg 47-51, Bioinformatics

Artificial Intelligence Institute, Faculty of Computer Science

Technical University Dresden, Germany

Abstract:

The modern IT infrastructure is rapidly evolving to provide an ambient, ubiquitous, pervasive computing environment where electronic facilities, services, computing power, and information will be everywhere and will be interconnected by a diverse array of networks, from ad-hoc local networks to the global Internet of Services & Things. This will lead to a fundamental change in the way in which information and communication technology applications are developed and used. Instead of building monolithic local IT systems, applications will be assembled to complex enterprise service networks and collaborative agent systems in a flexible way, distributed over the various heterogeneous local and global networks, and will be executed in large highly interconnect and arbitrary complex processes. This has already led to a great variety of new paradigms, e.g. ambient, ubiquitous, pervasive computing and IT technology trends such as complex event processing (CEP), service-oriented computing (SOC) and on-demand computing (autonomic, utility, grid computing). And, we have seen very promising advances in these fields in recent years in many application domains. Ultimately, this new technologies might lead to a ubiquitous Pragmatic Web where information consumers are provided with intelligent computational agents to transform existing information on the Web into relevant information of practical consequences. This talk describes several emerging technology trends and derives future challenges for a future Ubiquitous Pragmatic Web 4.0 of highly interconnected services, things and intelligent agents.

Speaker's Bio

Dr. Adrian Paschke is director of RuleML Inc. and research officer at the Biotec Innovation Center of Excellence at the Technical University Dresden. He received his PhD in Information Systems at the Technical University Munich (TUM) with a thesis on Rule Based Service Level Agreements. His academic carrier has let him to the Ludwig Maximilian University Munich, the Friedrich Alexander University Erlangen/Nuernberg, the Technical University Munich, the National Research Council in Canada, and recently to the Biotec Centre in Dresden. Adrian was involved in multiple industrial software development und business engineering projects. He has led several knowledge engineering projects in the areas of distributed heterogeneous information systems, distributed Semantic Web applications, agent technologies, supply chain management and monitoring, IT service management, service-oriented computing, as well as rule-based systems and complex event processing. He is steering-committee chair of the RuleML Initiative, Co-Chair of the Reaction RuleML technical group, founding member of the Event Processing Technology Society (EPTS), voting member of OMG, research member of W3C RIF TG and W3C HLCS IG, project leader of several open-source projects such as RBSLA, Rule Responder, Prova, and involved in several international and EU projects such as the EU Network of Excellence Rewerse, or the EU STREP Sealife.

Keynote #2

Title: Implementing Intelligent Sensor Networks for Monitoring Outdoor Spaces

Session Chair: Hong Tang

Invited Speaker:

Prof Ian W Marshall
Director, Centre for Environmental Informatics
Lancaster Environment Centre
Lancaster University
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LA1 4YQ, United Kingdom
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Abstract: There has recently been widespread interest in sensor networks and their applications. This has resulted in a considerable body of work simulating network protocols, and a smaller body of work addressing embedded intelligence, network management and real-world deployment. The group at Lancaster has focused on real world experimentation to test approaches to real world self-management behaviours in sensor networks for environmental monitoring. The talk will describe the needs of environmental monitoring for embedded intelligence in smart sensors, and the pros and cons of a range of possible approaches. The needs, risks and benefits will be illustrated using the experience gained from a series of sensor network technology trials in marine, urban and upland contexts undertaken by the group. A brief summary of current activity will be presented together with a view of future possibilities.

Speaker's Bio:

Ian is Professor and Director of Environmental Informatics in the Environment Centre at Lancaster University where his research focuses on new technologies for environmental monitoring, geo-hazard management and industrial asset condition monitoring. Currently he is leading the EPSRC WINES project PROSEN <<http://www.prosen.org.uk/>> (applying intelligent sensor networks to wind farm management), and is a PI in the DIAS <<http://www.dcs.gla.ac.uk/dias/>> (systems engineering for environmental sensor networks), NEPTUNE <<http://www.neptune.ac.uk/>> (sustainable management of water distribution systems) and TRAMSNOD <<http://gow.epsrc.ac.uk/ViewGrant.aspx?GrantRef=EP/D053544/1>> (sensor network traffic) projects. He is also a funded participant in the ARC network ISSNIP <<http://www.ee.unimelb.edu.au/ISSNIP/>> .

He was Technical Director of the DTI funded Envisense <<http://www.envisense.org/>> research centre (pervasive technology for natural environments) and, within Envisense, leader of the SECOAS <<http://www.lec.lancs.ac.uk/cei/secoas/secoas.htm>> project, which deployed an intelligent sensor network at the Scroby Sands wind farm site off the Norfolk coast. Between 2001 and 2003 he was a Royal Society Industry Fellow at University College London where he led research on self-organising sensor networks using nature inspired decentralised control algorithms, now being further developed in the current projects.

Previously he worked for BT where he led the Eurescom funded project CASPIAN and the FP5 project ANDROID. He was also a PI for the FP4 project COIAS and the ESPRIT project HIPPARCH. Between 1994 and 2002 he led the BT funded Alpine and MMN projects involving 6 major UK universities and UTS in Sydney. All of these projects focused on automated adaptation and management issues. He is the author of over one hundred papers and 17 patents in these areas. He served as a member of council at the Institute of Physics and is a fellow of several institutes. He currently serves on several institute committees and advisory panels, on EPSRC, DTI and European research panels, and on numerous programme committees.

Keynote #3

Title: Self-organization and Organizational Models for Holonic Multi-Agent Systems

Session Chair: Minjie Zhang

Invited Speaker:

Prof Sebastian Rodriguez

System and Transport Laboratory

University of Technology of Belfort-Montbéliard

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and

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Abstract: Complex systems are often characterized by networks of numerous interactive entities. They are called complex because of the complexity of their exhibited behaviors. These behaviors are the result of the non-linear aggregation of the local behaviors of their components. Multi-Agents Systems have become a natural tool for modeling, simulating and programming complex systems. Indeed, Multi-Agents Systems are composed of autonomous, reactive, proactive and interacting entities called agents engaged in the realization of a joint goal. Both types of systems are notably studied by their organization dynamics and by the emergence of organizational structures. However, in Complex Systems we usually find a great number of entities in interaction, acting at different levels of abstraction

Software agents and multi-agents systems (MAS) are recognized as both abstractions and effective technologies for modeling and building complex distributed applications. The current practice of MAS design tends to be limited to individual agents and small face to face groups of agents that operate in closed systems. However, MAS aim large scale systems operating in open environments. Moreover, agents are expected to organize and cooperate in order to fulfill system's goals. It seems improbable that a rigid unscalable organization could handle real world problems that often exhibit most of complex systems characteristics.

Analysis and modeling techniques able to represent several levels of abstraction and computation models that are capable to self-organize and adapt to environmental adversities are needed to overcome this issue. Among the possible solutions, Holonic Multi-Agent Systems (HMAS) seem to be a promising paradigm. HMAS are based upon self-similar entities, called holons, which define an organizational structure called holarchy. HMAS have shown to be a convenient way to engineer complex and open systems in any application domains.

In this talk, after a brief introduction to the history of HMAS, we will compare HMAS with existing MAS practice. We will then present an organizational modeling framework for HMAS and discuss some self-organizing mechanisms using this framework. Finally, some interesting areas for future research will be presented.

Speaker's Bio:

Sebastian Rodriguez is a Full Professor of the Department of Computer Science, National Technology University (NTU), Argentina. He is also the founder and director of the Advanced Technology Research Center of Tucumán, Argentina, and an associate researcher of the Systems and Transportation Laboratory at the University of Technology of Belfort-Montbéliard (UTBM), France. He received a Computer Engineer degree for the National University of Tucumán, Argentina, a M.S. degree in computer science from the University of Franche-Comté and a Ph.D. degree in computer science of the UTBM. He is a consultant and visiting scientist for several high-tech companies. His research interests include distributed systems, multi-agent systems, holonic MAS, complex systems and meta-models and methodologies for MAS.

Keynote #4

Title: Abstractions and Models for Developing Distributed and Grid Computing Applications

Session Chair: Ingo Timm

Invited Speaker:

Prof José C. Cunha
CITI Centre / Dept. Informatics
Fac. Science and Technology
Univ. Nova de Lisboa
Portugal
<http://asc.di.fct.unl.pt/~jcc>

Abstract: Parallel and distributed computing systems and applications exhibit increasing levels of interaction among components, new forms of dynamic behavior, due to changes in interaction and behavior, mobility, and increasing scale in system and application components. In the first part of the talk, we present a global overview of programming abstractions and models for the organisation and cooperation paradigms that are required to handle distribution and parallelism, scale, dynamism, and mobility. Illustrations of the above are presented in the remaining of the talk. In the second part, we focus on abstractions based on design patterns and pattern operators for dynamic composition of Grid applications, and for separating structural and behavioural properties. And how these can be integrated into workflow-based environments. In the third part, we discuss group programming abstractions, and how group models can ease the handling of interaction and coordination in small, medium, or large scale organisations. And how they can be viewed as units of system or application composition to help building and managing complex and dynamic organisations.

Speaker's Bio:

José C. Cunha Full Professor of Computer Science, and Chair of Computational Systems and Architectures, Department of Informatics, Fac. Science and Technology, Univ. Nova de Lisboa. Director of the CITI Centre for Informatics and IT (2001-2007), and Coordinator of the Parallel and Distributed Processing Group. Graduated in Electrical Engineering from IST-Techn. Univ. of Lisbon, and in Informatics Engineering from Univ. Nova de Lisboa. Ph.D. in Computer Science, and Habilitation in Computer Science, Univ. Nova de Lisboa.

Teaching and Research interests: Computer Architecture, Operating Systems, Parallel and Distributed Computing: Models, Tools and Environments, Problem-Solving Environments, Cluster and Grid Computing Systems. He has a regular activity of publications in international journals, books and conferences. He has recently co-edited the book *Grid Computing: Software Environments and Tools*, Springer-Verlag (2006).

He has been regularly involved as advisor, coordinator, and participant in national and international projects in Parallel and Distributed Processing. He is in the editorial board of several international journals, and is member of the steering committee of the Euro-Par conference series. He has a regular activity as organiser, chair and program committee member in international conferences and workshops on parallel and distributed computing. He was chair of Euro-Par 2005: the 11th International Conference on Parallel and Distributed Computing, and co-chair of ACM ITICSE 2005 Conference on Innovation and Technology in Computer Science Education.

More information: <http://asc.di.fct.unl.pt/~jcc>

Panel Discussion

Theme: **What Are the Complexity Challenges That Distributed Systems Are Facing?**

Session Moderator: Prof Minjie Zhang, University of Wollongong, Australia

Panelists: (TBC)

Prof Giuliano Armano, University of Cagliari, Italy

Prof Hans Czap, Universität Trier, Germany

Prof Ian Marshall, Lancaster University, UK

Prof Sebastian Rodriguez, University of Technology of Belfort-Montbéliard, France; Universidad Tecnológica Nacional, Argentina

Prof Ingo Timm, Universität Frankfurt am Main, Germany

Topics for discussion (but not limited to):

- (1) Pre-eminent complexity characteristics of future distributed systems
 - Distributing / decentralisation of autonomous systems (e.g., agents) → origins for system-of-systems architecture, emergence, micro-macro influence, structural uncertainty
 - Emergence, swarming, self-organisation, dynamics, openness
- (2) Examples of future complex distributed systems
 - Large-scale distributed pervasive embedded systems
 - Environmental systems with closed loops from sensor networks to monitoring and decision support
 - Large-scale future generation (4G) / autonomic communication/Internet systems
 - Biological cellular networks
 - Heterogeneous healthcare systems'
- (3) Potential solutions
 - To engineer emergence, swarming, self-organisation
 - Multi-scale multi-agent based modelling and simulation
 - Service-oriented software architectures

Tuesday 22 July 2008

BSPC (1) (SACC & NIMC)

Session Chair: Ingo Timm

SACC-09 BSPC	A Self-organizing Algorithm for Mobile Agents Formation Control	Miguel A. Sánchez-Acevedo, Ernesto López-Mellado and Félix Ramos-Corchado
SACC-10 BSPC	Digital Semiochemical Coordination	Holger Kasinger, Jörg Denzinger and Bernhard Bauer
NIMC-19 BSPC	On the Rebroadcast Probability of an Enhanced Counter-Based Broadcast Scheme for Mobile Ad Hoc Networks	Aminu Mohammed, Mohamed Ould-Khaoua, and Lewis M. Mackenzie

AOSDM

Session Chair: Xinjun Mao

AOSDM-08 BSPC	Methodological Development of a Multi-Agent System in the Healthcare Domain	David Isern, Cristina Gómez-Alonso and Antonio Moreno
AOSDM-09	WIKI.MAS: A MultiAgent Information Retrieval System for Classifying Wikipedia Contents	Andrea Addis, Giuliano Armano and Eloisa Vargiu
AOSDM-05	Modeling and Checking Adaptive MAS with ODAMTools	Xinjun Mao, Hong Ning, Cuiyun Hu and Ji Wang

BSPC (2) (CODS & IISE)

Session Chair: Jose Cunha

CODS-02 BSPC	FUNGO: An Algorithm to Derive Local Interaction Protocols from WS Choreographies	Roberto Furnari
CODS-10 BSPC	Semantics Supported Access Authorization Based on Decentralized Architecture	Mohammad M. R. Chowdhury, Josef Noll and Najeeb Elahi
IISE-14 BSPC	A UML-Based Requirements Analysis with Automatic Prototype System Generation	Shinpei Ogata and Saeko Matsuura

BSPC (3) (ABS) & IISE (1)

Session Chair: Hans Czap

ABS-02 BSPC	Scalable Continuous Query Architecture for eCommerce and Legal Disputes	Ather Saeed, Andrew Stranieri, Richard Dazeley and Liping Ma
ABS-06 BSPC	Capturing the B2B Transaction Experience	Moses Niwe
IISE-07	Agent-Based Process Industrial Automation Reconfiguration	Na Luo, Wenli Du, Feng Qian, Rongbin Qi, and Huaglong Tianfield

BSBAL

Session Chair: Giuliano Armano

BSBAL-04 BSPC	A Model of Transcytosis Processes across the Blood Brain Barrier	Andrea Mannini, Anna Gaglianese, Sandra Perondi, Gianni Ciofani and Alberto Landi,
BSBAL-11	GAME: A Generic Architecture based on Multiple Experts for Predicting Protein Structures	Filippo Ledda, Luciano Milanese and Eloisa Vargiu
BSBAL-12	Inference of Boolean Networks from Gene Expression Data Using Wavelet and Steady State Distribution Analysis	Le Yu and Stephen Marshall

IISE (2)

Session Chair: Angel Barriga

IISE-18	Design of a Modified Predictive Optimal Controller for a 1000MW Once-Through Boiler	Won Hee Jung, Jwa Young Maeng, Sung Ho Kim and Kwang Yun Lee
IISE-21	Using the Semantic Web for the Integration of Feature-based CAD Models Information	Samer Abdul-Ghaffour, Parisa Ghodous, Behzad Shariat, and Eliane Perna
IISE-06	Design and Implementation of an Edge Detection Circuit Based on Soft Computing	Angel Barriga and Nashaat M. Hussein

Wednesday 23 July 2008

NIMC (1)

Session Chair: Yu Wu

NIMC-14	Multi Parameter Based Vertical Handoff Decision in Next Generation Networks	Anita Singhrova and Nupur Prakash
NIMC-18	Integrated Public Transport Monitoring and Information System Using Location Based Services Applications	Norleyza Jailani, Mohd Norfaizi Mihsany, Marini Abu Bakar, Noor Faezah Mohd Yatim, Salha Abdullah Yu Wu, Kai Zhou, Jie Su and Hong Tang
NIMC-08	Kinetic Parameter Mining of Swarm Behavior Based on Rough Set	

ABS (1)

Session Chair: Richard Germain

ABS-04	Method Requirements for Information Demand Analysis	Magnus Lundqvist, Kurt Sandkuhl, Ulf Seigerroth and Janis Stirna
ABS-10	Context Aware Business Adaptation toward User Interface Adaptation	Anas Hariri, Dimitri Tabary, Sophie Lepreux and Christophe Kolski
ABS-08	Electronic Supply Chain Integration: The Moderating Effect of Cooperative Norms	Richard Germain, Garry Buttermann and Karthik Iyer

NIMC (2) & ABS (2)

Session Chair: Hong Tang

ABS-03	Schedule Nervousness Reduction in Transport Re-Planning	Jörn Schönberger and Herbert Kopfer
NIMC-21	Design and Realization of Linux Based Wireless Data Acquisition System	Y. Cheng, Y. Fun Hu, P. Jiang, S. Brown and A. Metcalfe
NIMC-07	A Pseudo-GA for Estimating Network Traffic Matrices	Hong Tang and Tong-Liang Fan

CODS (1)

Session Chair: Jose Cunha

CODS-15	Discovering and Exchanging Information About Users in a SOA Environment	Federica Cena and Roberto Furnari
CODS-16	A Condition Formula Search	Toshio Kodama, Tosiyasu L. Kunii and Yoichi Seki
CODS-12	Colored Petri Net Based Scheduling for Agent-Based Grid Systems	Quan Bai and Minjie Zhang

Thursday 24 July 2008

SACC (1)

Session Chair: Jose Fabregat-Pinilla

SACC-01	Using Contracts for Self-Management	Jens Bruhn and Guido Wirtz
SACC-03	Adaptive Coalition Structure Generation in Cooperative Multi-agent Systems	Giovanni Rossi and Gabriele D'Angelo
SACC-13	A Social Reinforcement Teaching Approach to Social Rules	Jose Fabregat-Pinilla, C. Carrascosa and Vicente J. Botti

SACC (2)

Session Chair: Ingo Timm

SACC-06	Self-Organised Service Network for Dynamic Logistics: Framework and Case Study	Alexander Smirnov, Nikolay Shilov, Tatiana Levashova and Alexey Kashevnik
SACC-08	A Service-Driven Approach for Sensor Web Progressive Self-Organization	Nafaâ Jabeur and Youssef Iraqi
SACC-12	Global Order From a Minimal Local Resource Allocation Strategy	Mariusz Jacyno Seth Bullock Terry Payne and Michael Luck

CODS (2) & ABS (3)

Session Chair: Linpeng Huang

ABS-01	Model Driven Implementation of Business Processes Based on Web Service Nets	Maik Herfurth, Thomas Karle and Ralf Trunko
CODS-04	BDI Agent-Oriented Design for Distributed Intrusion Detections	Dayong Ye, Quan Bai and Minjie Zhang
CODS-01	Formal Refinement Model of OSGi based System	Jiankun Wu, Linpeng Huang, Dejun Wang

SACC (3)

Session Chair: Tatiana Levashova

SACC-14	Model Driven Autonomic Software Development Support	Y. Abuseta and A. Taleb-Bendiab
SACC-20	Multi-layer Coordinated Adaptation Based on Graph Refinement for Cooperative Activities	Ismael Bouassida Rodriguez, Nicolas Van Wambeke, Khalil Drira, Christophe Chassot, and Mohamed Jmaiel
SACC-22	Management-by-Exception - A Modern Approach to Managing Self-Organizing Systems	René Schumann, Andreas D. Lattner and Ingo J. Timm

Communications of SIWN

Volume 3 ▪ June 2008

SIWN Abstracts Index

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Scalable Continuous Query Architecture for eCommerce and Legal Disputes

Ather Saeed, Andrew Stranieri, Richard Dazeley and Liping Ma

Communications of SIWN, Vol. 3, June 2008, pp. 1-6

Abstract: Continuous Queries (CQ) are persistent, content sensitive and time dependent. Once the CQ is installed it will continuously poll the data sources and monitor updates of interest. This paper discusses major problems and issues with the existing CQ techniques for monitoring updates of interest on the web. A new Continuous Query based architecture is proposed to deal with the context sensitive problems of negotiation, mediation and arbitration to resolve Ecommerce and legal disputes. A business process model is given to automate mediation and arbitration processes in ODR (Online dispute resolution) to resolve disputes efficiently and in a timely manner. In the proposed CQ-Mediator architecture partial page update and web services are integrated for efficient monitoring and notification of updates to the disputants, mediators and arbitrators. Performance results of the proposed architecture and business process model for CQ-based ODR is also discussed in the experiment section.

Keywords: continuous queries, AJAX, web services, online dispute resolution

sai: cosiwn.2008.06.124

Schedule Nervousness Reduction in Transport Re-Planning

Jörn Schönberger and Herbert Kopfer

Communications of SIWN, Vol. 3, June 2008, pp. 7-14

Abstract: This article reports about investigations on a transport scheduling scenario. The generated schedule requires a repeated revision in order to incorporate additionally released requests. Neither the release time nor the location of the associated customer site can be forecasted. Special attention is paid to keep the generated schedules stable, which means that once made scheduling decisions should be maintained (announced arrival times at customer sites, etc.) Initially, several measures for the nervousness degree are proposed. In computational simulations it turns out that a very high nervousness degree appears if the same schedule update strategies are applied for different workloads. As a remedy, the adaptation of the used schedule update strategy to the current schedule performance is proposed. A prototypic algorithm framework is presented and assessed in comprehensive numerical simulation experiments. The adaptation of the schedule update strategies contributes to a significant reduction of some observed nervousness degrees. It reinforces the preservation of once fixed arrival times at customer sites.

Keywords: Adaptive Decision Model, Transport Scheduling, Online Optimization, Uncertainty, Reactive Planning

sai: cosiwn.2008.06.125

Method Requirements for Information Demand Analysis

Magnus Lundqvist, Kurt Sandkuhl, Ulf Seigerroth and Janis Stirna

Communications of SIWN, Vol. 3, June 2008, pp. 15-21

Abstract: In this paper we analyze the methodological requirements for Information Demand Analysis (IDA) i.e. capturing, representing, and modeling information demand by means of Enterprise Models (EM). The paper presents the background of IDA and defines the initial requirements and then discusses the suitability of one example EM method, EKD.

Keywords: information demand analysis, information logistics, enterprise modeling, context.

sai: cosiwn.2008.06.126

Capturing the B2B Transaction Experience

Moses Niwe

Communications of SIWN, Vol. 3, June 2008, pp. 22-26

Abstract: This research uses a pattern approach to capture experiential knowledge in the business-to-business (B2B) systems domain. Multiple companies are selected to develop the patterns and Qnet experience is presented as a case for validating these patterns. The patterns act as guidelines and suggestions that give advice on how to apply operational practices and communication aspects of B2B systems to solve similar problems and avoid duplication of efforts in the exchange of transaction data.

Keywords: B2B systems, patterns.

sai: cosiwn.2008.06.127

Knowledge Management Framework for Interoperability of Virtual Enterprise

Chengzhu Sun, Xiaofei Xu, Shengchun Deng and Xiangyang Li

Communications of SIWN, Vol. 3, June 2008, pp. 27-31

Abstract: In order to accomplish interoperability of partners in the virtual enterprise, knowledge must be organized well by means of knowledge management. Present knowledge management framework not fits virtual enterprise because virtual enterprise, different from a single company, is agile, distributed, with specific activities of knowledge management. A knowledge management framework is proposed to solve this problem. The interoperability of virtual enterprise is supported by united knowledge representation, recognized ontology formulation, convenient knowledge share as well as valid knowledge mapping etc. Based on knowledge model of virtual enterprise, a new knowledge representation schema based on ontology is proposed and corresponding ontology representation language is described. To address the requirement of interoperability for virtual enterprise, a knowledge management framework including knowledge activities and their assistant factors is put forward. The knowledge activities in knowledge management framework such as knowledge extraction, maintenance, match/mapping and evaluation are explained in detail. Finally, an instance about a certain virtual enterprise is given briefly to demonstrate the application of the knowledge management framework.

Keywords: knowledge management, framework, virtual enterprise, interoperability, ontology.

sai: cosiw.2008.06.128

Model Driven Implementation of Business Processes Based on Web Service Nets

Maik Herfurth, Thomas Karle and Ralf Trunko

Communications of SIWN, Vol. 3, June 2008, pp. 32-38

Abstract: In the development of modern IT systems, there is a trend towards adaptive systems. In this paper, we regard adaptation in terms of context awareness in the area of business process modelling and management. In this contribution, we focus on context awareness at build time by using Web Service nets, a new variant of high level Petri nets by using an MDA approach. The approach provides a model based process definition as well as a generation and implementation of executable WSBPEL processes.

Keywords: model driven development, business process modelling, business process management, context awareness, WSBPEL, model driven architecture, code generator.

sai: cosiw.2008.06.129

Electronic Supply Chain Integration: The Moderating Effect of Cooperative Norms

Richard Germain, Garry Buttermann and Karthik Iyer

Communications of SIWN, Vol. 3, June 2008, pp. 39-45

Abstract: The research focuses on understanding whether cooperative norms with customers influences the linkages among electronic supply chain integration, decentralized adoption over supply chain information technology (IT), industry process turbulence, and financial performance. The key finding is that that electronic supply chain integration associates with performance only when cooperative norms are high. In addition, this thwarts the financial benefits that accrue from decentralized decision-making over supply chain IT adoption.

Keywords: electronic supply chain integration; cooperative norms, financial performance

sai: cosiw.2008.06.130

Context Aware Business Adaptation toward User Interface Adaptation

Anas Hariri, Dimitri Tabary, Sophie Lepreux and Christophe Kolski

Communications of SIWN, Vol. 3, June 2008, pp. 46-52

Abstract: The growth of user mobility has created new user needs. Cellular phones, personal assistants and modern communication means are now required for all user tasks. Users want services that are specifically mobile, but they also want to work with and have access to the same applications on their mobile devices as they have at their work place. The mobile system must thus be adapted according to the task and the context (i.e., platform, user and environment characteristics). Usually, adapting an interactive system implies costly User Interface (UI) redesign and reimplementation procedures, with the goal of adapting the business components to the human activity, selecting the interface appropriate to the task and the context. This paper describes an adaptive UI design approach that allows UI to be generated and dynamically adapted to changeable contexts, while preserving the UI's utility and usability. In our approach, patterns are used to connect UI adaptation problems, with their multiple contexts, to usable design solutions. This approach is illustrated by a case study.

Keywords: user interface adaptation, business component adaptation, user interface generation.

sai: cosiw.2008.06.131

Modeling and Checking Adaptive MAS with ODAMTools

Xinjun Mao, Hong Ning, Cuiyun Hu and Ji Wang

Communications of SIWN, Vol. 3, June 2008, pp. 53-57

Abstract: It is still a challenge to apply agent technology to develop complex systems that are self-adaptive to their environments. Software quality is often ignored in existing agent-oriented modeling languages and methodologies, and therefore it is difficult to guarantee the established models are correct and consistent. In this paper, we present an adaptive mechanism and language facility to model adaptive multi-agent systems. Our approach is based on the organization metaphor to control system complexity. A number of model constraints are defined for checking whether the established models for specifying adaptation of agents are well-defined, and a CASE toolkit has been developed to support the modeling and checking of adaptive systems in an automatic or semi-automatic way. A case is also demonstrated to illustrate our approach.

Keywords: adaptive system, multi-agent system, agentoriented software engineering, dynamic binding mechanism

sai: cosiw.2008.06.132

A Formal Approach for Modeling Software Agents Coordination

Lily Chang, Junhua Ding, Xudong He and Sol M. Shatz
Communications of SIWN, Vol. 3, June 2008, pp. 58-64

Abstract: In this paper, we propose a nested Petri net approach to model the coordination of multi-agent systems. A higher level net (called host net) defines the movements and coordination mechanism of agents, while lower level nets (called agent nets that are tokens of the host net) model the behavior of individual agents. A dynamic channel concept and the notation are introduced for modeling the communications and coordination between the host net and agent nets. We demonstrate our modeling approach through an e-market example. Our approach promotes the extensibility and flexibility of multiple agent system design through dynamic channels.

Keywords: modeling, multi-agent system, coordination, Petri nets.

sai: cosiw.2008.06.133

Methodological Development of a Multi-Agent System in the Healthcare Domain

David Isern, Cristina Gómez-Alonso and Antonio Moreno
Communications of SIWN, Vol. 3, June 2008, pp. 65-69

Abstract: This paper describes the development of a multiagent system using one of the available agent-oriented software engineering (AOSE) methodologies. The system to implement includes different intelligent agents representing a medical organization with different roles and communication patterns, as well as the interaction with human users (patients and medical staff). The analysis-to-implementation procedure following an AOSE approach describes in a formal way the actors, the organization, the internal behaviour, and the conversations between all partners, and in consequence the quality of the final resulting software is improved. A detailed survey of the available AOSE methodologies was made, and the one most suitable for the requirements of this particular application (INGENIAS) was selected. Following the rules defined by this approach, a methodological study of the multi-agent system was performed and a prototype was successfully implemented.

Keywords: multi-agent system, agent-oriented software engineering methodology, healthcare services.

sai: cosiw.2008.06.134

Towards the Definition of Agent-UP: The DIVAs Process

Y. Haghpanah-Jahromi, R. Zalila-Wenkstern, R. Steiner and K. Cooper
Communications of SIWN, Vol. 3, June 2008, pp. 70-75

Abstract: In this paper we present a process for the development of a specific category of MAS, called Agent-Environment Systems (AES). In an AES, the environment plays a critical role, and is treated as a first class entity. We describe our process, and illustrate its iterative, evolutionary, and model driven features by discussing the development of an environment for a multi-agent based simulation system.

Keywords: software process, multi-agent simulation systems.

sai: cosiw.2008.06.135

Search with Meanings: An Overview of Semantic Search Systems

Wang Wei, Payam M. Barnaghi and Andrzej Bargiela
Communications of SIWN, Vol. 3, June 2008, pp. 76-82

Abstract: Research on semantic search aims to improve conventional information search and retrieval methods, and facilitate information acquisition, processing, storage and retrieval on the semantic web. The past ten years have seen a number of implemented semantic search systems and various proposed frameworks. A comprehensive survey is needed to gain an overall view of current research trends in this field. We have investigated a number of pilot projects and corresponding practical systems focusing on their objectives, methodologies and most distinctive characteristics. In this paper, we report our study and findings based on which a generalised semantic search framework is formalised. Further, we describe issues with regards to future research in this area.

Keywords: semantic search, knowledge acquisition, semantic web, information retrieval.

sai: cosiw.2008.06.136

WIKI.MAS: A MultiAgent Information Retrieval System for Classifying Wikipedia Contents

Andrea Addis, Giuliano Armano and Eloisa Vargiu
Communications of SIWN, Vol. 3, June 2008, pp. 83-87

Abstract: The increasing availability of documents in digital form, together with the corresponding volume of daily updated contents, makes the problem of retrieving documents and data a challenging task. In this paper, we present WIKI.MAS, an information retrieval system devoted to retrieve and classify Wikipedia contents according to users' interests and preferences. The proposed system has been built upon X.MAS, a generic multiagent architecture devised to implement information retrieval tasks.

Keywords: multiagent architectures, information retrieval

sai: cosiw.2008.06.137

A Model of Transcytosis Processes across the Blood Brain Barrier

Andrea Mannini, Anna Gaglianese, Sandra Perondi, Gianni Ciofani and Alberto Landi
Communications of SIWN, Vol. 3, June 2008, pp. 88-94

Abstract: Several problems that involve brain drug delivery depend on the possibility of drugs to cross the blood brain barrier (BBB). In this study, an analytical model of transcytosis - an important mechanism of BBB crossing - is proposed, with the

main task to help researchers in the pharmaceutical field, according to ethical problems that involve in vivo brain studies. The proposed model is a generalization of previous models of endocytosis extended to exocytosis process at the apical side of BBB endothelial cells. A set of eight differential equations is obtained and simplified, according to biological hypotheses. Thanks to this model, it is theoretically possible to predict the concentration of a selected molecule in the brain, as a function of its concentration in the plasma. This paper reports on model definition and its implementation in the Matlab Simulink environment.

Keywords: biological modeling, blood brain barrier, transcytosis, transferrin.

sai: cosiw.2008.06.138

Searching Similar Antimicrobial Structures Using Quick Search and Horspool Algorithms

Ahmad Fadel Klaib, Wahidah Husain and Zurinahni Zainol

Communications of SIWN, Vol. 3, June 2008, pp. 95-101

Abstract: In this study Antimicrobial Structures in SMILES format with the corresponding information from NMRShiftDB were extracted and stored into the new local database which consists of 78 relational tables. Additionally, a searching tool was developed which would response to user's query using the JME Editor. Using this tool user can draw or edit molecules structure and the system will convert the structure into SMILES format. Subsequently, both Horspool and Quick Search algorithms were applied to the queried structure as a pattern to find all structure or substructure occurrences inside other Antimicrobial Structures in the local database. Finally, the similarity percentage between the similar structures was calculated using Jaccard's coefficient and Jaccard's distance algorithms.

Keywords: antimicrobial structures; horspool algorithm; quick-search algorithm; Jaccard's coefficient and Jaccard's distance algorithms.

sai: cosiw.2008.06.139

Model Reduction of an Signalling Transduction Pathway Based on Global Sensitivity Analysis

Jianfang Jia and Hong Yue

Communications of SIWN, Vol. 3, June 2008, pp. 102-106

Abstract: A model reduction method based on global sensitivity analysis (GSA) is proposed in this paper and applied to the I κ B α -NF- κ B signalling transduction pathway network. This approach uses the modified Morris method to analyze the global parametric sensitivities. According to the results of global sensitivities, the number of the biological reactions is reduced by eliminating those reactions that are identified to be insensitive. Simulation results demonstrate that the output prediction of the simplified model is very close to that of the original model.

Keywords: model reduction, global sensitivity analysis, Morris method, signalling pathway network

sai: cosiw.2008.06.140

GAME: A Generic Architecture based on Multiple Experts for Predicting Protein Structures

Filippo Ledda, Luciano Milanese and Eloisa Vargiu

Communications of SIWN, Vol. 3, June 2008, pp. 107-112

Abstract: Generic tools, i.e., software architectures characterized by high flexibility and easily customizable to performspecific tasks, can greatly facilitate the everyday work of bioinformaticians. In this paper we present GAME, a Generic Architecture based on Multiple Experts devised to support the research in protein structure prediction. GAME is presented from both an architectural and a technological point of view. How to customize GAME with the goal of getting a specific secondary structure predictor is also described. The proposed case studies show that, with GAME, it is possible to easily develop systems and perform tests. **Availability:** GAME can be downloaded from <http://iasec2.diee.unica.it/GAME>.

Keywords: generic tools, protein structure prediction

sai: cosiw.2008.06.141

Inference of Boolean Networks from Gene Expression Data Using Wavelet and Steady State Distribution Analysis

Le Yu and Stephen Marshall

Communications of SIWN, Vol. 3, June 2008, pp. 113-117

Abstract: Switch-like phenomena within biological systems complicate the modeling of gene regulatory networks. To tackle this problem, a number of approaches have been proposed. It is usually necessary to observe a large number of sample points in order to infer model parameters accurately resulting in high computational cost. However, only a limited number of samples can be observed in realistic biological systems. This has motivated the researchers to develop a new algorithm based on the wavelet transform for data partitioning under different biological conditions. Due to the large number of data required and the limited number of independent experiments, the inference of genetic regulatory networks from gene expression data is a challenge of long standing within the microarray filed. Therefore, this paper also investigates the inference of Boolean networks with perturbations (BNp) based on the analysis of the steady state distribution of data. The resulting algorithm is then applied to the interferon regulatory network using gene expression data taken from murine bone-derived macrophage cells.

Keywords: Boolean network, wavelet transform, gene regulatory network, network inference, probabilistic Boolean network

sai: cosiw.2008.06.142

Hybrid Swarm with Subpopulations of Particle Swarm Optimization and Its Application in Soft-sensor of Gasoline Endpoint

Hui Wang and Feng Qian

Communications of SIWN, Vol. 3, June 2008, pp. 118-124

Abstract: This paper proposes a hybrid swarm with subpopulations scheme of particle swarm optimization (HSSPSO). In HSSPSO, particles in one swarm evolve for certain generations and then divided into two subpopulations by fitness of them to evolve certain generations. Subsequently two subpopulations will be shuffled together to be a new swarm again. The process is repeated until the terminal conditions satisfied. The performance of HSSPSO is investigated by some benchmark problems and compared with other version PSO. Furthermore, HSSPSO is applied to train artificial neural network to construct a soft-sensor of gasoline endpoint of crude distillation unit. The results show that the model constructed by HSSPSO is better than that of particle swarm optimization.

Keywords: particle swarm optimization; subpopulation; shuffled; soft-sensor

sai: cosiw.2008.06.143

On an Unknown Property of the LQ Control Problem

Cs. Bányász and L. Keviczky

Communications of SIWN, Vol. 3, June 2008, pp. 125-129

Abstract: The specific relationships between the classical pole-placement state feedback, the Riccati equation based LQ paradigm and the Kalman frequency domain approach are discussed. It is shown that arbitrary pole placement is not possible by standard LQ optimality.

Keywords: LQ problem, Kalman equation, optimality

sai: cosiw.2008.06.144

Modeling Hybrid Reconfigurable Manufacturing Systems Using Petri Nets

Ons Lejri and Moncef Tagina

Communications of SIWN, Vol. 3, June 2008, pp. 130-134

Abstract: Hybrid manufacturing systems are systems that combine continuous dynamics with a discrete global dynamic. Considering the intrinsic complexity of such systems, their modeling represents an important and essential step to their survey, control, supervision, surveillance and their reconfiguration. Our work in this topic focuses on hybrid manufacturing systems reconfiguration. We are especially interested in this paper on proposing a model-based method for the reconfiguration of this kind of systems.

Keywords: Hybrid manufacturing systems, reconfiguration, model-based approach, Petri nets.

sai: cosiw.2008.06.145

Design and Implementation of an Edge Detection Circuit Based on Soft Computing

Angel Barriga and Nashaat M. Hussein

Communications of SIWN, Vol. 3, June 2008, pp. 135-139

Abstract: A technique for edge detection in images and its hardware implementation is presented in this communication. The presented technique applies soft computing strategies for each of the stages of the edge detection process. Fuzzy logic and Lukasiewicz's algebra operator are applied in the above mentioned stages. The hardware implementation of the system takes as design criterion the low cost and a high processing speed.

Keywords: edge detection, fuzzy logic system, hardware implementation.

sai: cosiw.2008.06.146

Agent-Based Process Industrial Automation Reconfiguration

Na Luo., Wenli Du., Feng Qian., Rongbin Qi, and Huaglorry Tianfield

Communications of SIWN, Vol. 3, June 2008, pp. 140-144

Abstract: Nowadays agility in business requires building a reconfigurable process automation system that can be quickly re-organized as and when the available flexibility within process system has been fully exploited. Agent-based process industrial automation is found to be an effective approach to reconfiguration of distributed automation systems. This paper gives structure and basic methods to construct a multi-agent based reconfigurable process automation system. After discussing how to decompose the process systems to agents, ontology of the system is given. How to define agent and communication between agents is also discussed.

Keywords: multi-agent system, ontology, intelligent manufacturing, distributed automation.

sai: cosiw.2008.06.147

Chaotic Time Series Direct Prediction Using Extreme Learning Machine

Honggang Wang, Ke Meng, Rongbin Qi and Feng Qian

Communications of SIWN, Vol. 3, June 2008, pp. 145-149

Abstract: A novel technique of using the Extreme Learning Machine (ELM) for both short-term and long-term predictions of chaotic time series is proposed and investigated. ELM is a novel learning method for singlehidden layer feedforward neural networks by generating the input weights and hidden bias randomly and determining the output weights analytically. Comparisons against radial basis function network (RBFN) and four back-propagation-trained networks (BPN) are performed. Further investigations on the performance of ELM with respect to different activation functions and initial parameters show its robustness. Numerical experiment results based on Mackey-Glass time series prediction show that the ELM can better capture dynamics from chaotic time series and achieve higher accuracy than most of conventional learning algorithms. Moreover, the extremely fast speed of ELM makes it a good candidate for on-line prediction application.

Keywords: chaotic time series, direct prediction, extremely learning machine, global models, long-term prediction.

sai: cosiw.2008.06.148

Rigid Body Satellite Attitude Control Method Based on State Dependent Riccati Equation

Ping Sun and Kun Liu

Communications of SIWN, Vol. 3, June 2008, pp. 150-154

Abstract: In this paper a control approach is presented for three-axis stable attitude control of a rigid body satellite using both State Dependent Riccati Equation (SDRE) method and Fast Output Sampling (FOS) technique. The dynamics and kinematics for satellite attitude problem are of typical nonlinear character. SDRE technique has been well applied to this kind of highly nonlinear control problems. But in practice the system states needed in the SDRE method are sometimes difficult to obtain. FOS method, which makes use of only the output samples, is combined with SDRE to estimate an approximate system state. Thus, the control approach is more practical and easy to implement. The method and its stabilization are examined under numerical simulations and the results show that the proposed method produces excellent results in rigid body satellite attitude control.

Keywords: State Dependent Riccati Equation (SDRE), Fast Output Sampling (FOS), attitude control.

sai: cosiw.2008.06.149

Improvement of Stochastic Particle Swarm Optimization by Succession Strategy

Jin Yu, Feng Qian and Rongbin Qi

Communications of SIWN, Vol. 3, June 2008, pp. 155-159

Abstract: For the purpose of raising the efficiency of particle swarm optimization (PSO) algorithm, a new improved approach combining succession strategy (SS) and stochastic PSO (SPSO) is presented, termed SS-SPSO. With succession strategy, the SS-SPSO emphasizes the relationship between acceleration coefficient and inertia weight, it is proved to be a high speed algorithm through simulations with two benchmark test functions. Unify SPSO to be able also to guarantee global convergence. This new approach can be modified with a random inertia weight (Modified SS-SPSO) instead of linear decrease inertia weight of the SPSO. The result of the present work implied that the SS-SPSO and its modified version have quick convergence speed and less computational time compared to SPSO.

Keywords: particle swarm optimization (PSO), succession strategy, adaptive acceleration factor.

sai: cosiw.2008.06.150

Multiobjective Algorithm Based on the Evolution of Pareto Archive and Individual Migration

Tianyi Ma, Hongwei Liu, Xiaozong Yang and Rongbin Qi

Communications of SIWN, Vol. 3, June 2008, pp. 160-165

Abstract: A multiobjective evolutionary algorithm combining the evolution of multiple single objective population and Pareto archive population is proposed, where, the single objective evolutionary algorithm is implemented to optimize separately each of the multiobjective functions. At each evolving iteration, this algorithm maintains a finitesized archive population of nondominated solutions which gets iteratively updated in the presence of new solutions based on the concept of Pareto dominance and is trimmed by crowded-comparison operator to preserve the diversity of solutions. Especially, in order to improve converging performance and diversity of solutions, individuals in Pareto archive population also join evolutionary operations and good individual from Pareto archive population are migrated to the corresponding single objective population by tournament selection. Simulation results of six typical test problems demonstrate that the proposed method can realize the search from multiple directions to obtain the nondominated solutions scattered more uniformly over the Pareto frontier with better convergence metric and diversity metric compared to well-known NSGA- II and PAES algorithms, and the other simulation results manifest that individuals migrating from the Pareto archive population help to improve the converging speed and converging precision.

Keywords: evolutionary algorithm; multiobjective optimization; pareto archive; nondominated solutions.

sai: cosiw.2008.06.151

A UML-Based Requirements Analysis with Automatic Prototype System Generation

Shinpei Ogata and Saeko Matsuura

Communications of SIWN, Vol. 3, June 2008, pp. 166-172

Abstract: It has been widely acknowledged that ambiguous and incomplete user requirements need to be specified entirely and correctly at an early stage of system development in order to create high quality software products. Several researchers have been proposing the automatic generation of a prototype system from the requirements analysis model based on UML (Unified Modeling Language) in order to directly validate user requirements. Because the requirements analysis model consists of several UML diagrams that have different viewpoints, it is generally difficult for the developers to precisely understand the relation between the model and the prototype system generated. However, the developers need to modify the model according to future user requirements. This paper proposes a stepwise protocol for the development of a requirements analysis model and for the automatic generation of the prototype system, which includes an appropriate concrete example, so that the developers can understand the relation between these 2 entities. We discuss the effectiveness of our approach by applying it to the development of a library search service system.

Keywords: prototyping for web application, requirements analysis, unified modeling language.

sai: cosiw.2008.06.152

Dynamic Web Service Composition and Configuration

Xianfei Tang, Changjun Jiang, Cheng Wang and Jiujun Cheng

Communications of SIWN, Vol. 3, June 2008, pp. 173-178

Abstract: Web service composition lets developers create applications rapidly on top of a service-oriented computing paradigm. A staged automatic Web service composition method is proposed in this paper. Firstly, the abstract service - the function abstraction of the concrete Web services that provide same functionality and have same inputs/outputs - is defined. Then based on propositional logical inference and Petri nets, an automatic Web service composition method is proposed to generate abstract composite processes that fulfill client's input/output query. Finally, an executable composite service can be obtained through service configuration considering the client's non-functional requirements. This staged approach makes the composite process more reliable and robust. If changes occur, we just need to reselect the available concrete Web services instead of regenerating the composite process from scratch.

Keywords: Web service, service composition, service configuration, logical inference, Petri nets.

sai: cosiw.2008.06.153

Design of a Modified Predictive Optimal Controller for a 1000MW Once-Through Boiler

Won Hee Jung, Jwa Young Maeng, Sung Ho Kim and Kwang Yun Lee

Communications of SIWN, Vol. 3, June 2008, pp. 179-183

Abstract: This paper presents a modified predictive controller based on a neural network model for a 1000MW once-through boiler. To design the controller, the boiler was modeled with four processes (air/flue gas, pulverizer, water/steam and turbine/generator) and 19 subsystems (economizer, superheater, reheater, etc). A Neural Network algorithm was used to model each. The proposed controller has a special transmission and real time learning function for additional tuning of the model. The Particle Swarm Optimization algorithm was used for searching the optimum solution of control inputs meeting with the constraints of each subsystem. For the validation of controller performance, the controller was tested and simulated under various operating conditions.

Keywords: neural network, optimal control, on-line identification, power plant control

sai: cosiw.2008.06.154

Ordinal Virtual Enterprise Modeling Based on Resource-Finding Path

Chengzhu Sun, Xiaofei Xu, Xiangyang Li and Shengchun Deng

Communications of SIWN, Vol. 3, June 2008, pp. 184-188

Abstract: In the decision-making process of virtual enterprise building, modeling is an important stage to provide information for decision. It is difficult for present modeling approaches to ensure that models are consistent and helpful to virtual enterprise building. To solve this problem, a new ordinal modeling approach for virtual enterprise is put forward. In view of the importance of resource during the period of virtual enterprise building, a new conception called resource-finding path is proposed, and virtual enterprise model based on resource-finding path is given. Based on the description of modeling levels, an ordinal modeling framework for virtual enterprise based on resource-find path is put forward with consideration of economic factors that influence modeling. The consistency checking mechanism is explained briefly. Based on the goal of virtual enterprise modeling, architecture of modeling system is proposed and the implementation of modeling system is explained briefly. Finally, the key properties of the proposed approach are illustrated by comparing with other modeling approaches.

Keywords: virtual enterprise, modeling, resource-finding path, framework, consistency.

sai: cosiw.2008.06.155

Using the Semantic Web for the Integration of Feature-based CAD Models Information

Samer Abdul-Ghaffour, Parisa Ghodous, Behzad Shariat, and Eliane Perna

Communications of SIWN, Vol. 3, June 2008, pp. 189-193

Abstract: Nowadays, the increasing number of product development tools entails an effective communication among design collaborators. Indeed, heterogeneous tools and multiple designers are frequently involved in collaborative product development, and designers often use their own terms and definitions to represent a product design. Hence, modeling terms should be semantically processed both by design collaborators and intelligent systems. In this paper, we investigate the use of Semantic Web technologies, such as descriptive logic-based ontologies and semantic web rules for the integration of featurebased CAD models. A case study is illustrated at the end of this paper providing an example of integrating "hole" features between two CAD systems.

Keywords: CAD Interoperability, Feature-based design, Semantic Web technologies, Semantic rules.

sai: cosiw.2008.06.156

The Relationship between Agile Manufacturing System and Lean-Six Sigma Techniques

Yousef Mohammad Karimi

Communications of SIWN, Vol. 3, June 2008, pp. 194-199

Abstract: This paper survey the relationship between agile manufacturing system and Lean-Six Sigma techniques. This research was carried out in a large company based in the India in the business of converting printed paper from customers into electronic copies. The paper material is quite heterogeneous in nature consisting of assorted magazines and legal papers. The narrative unfolds in the same sequence as the research did pointing out the critical stages where results were achieved and where mindset changes occurred. Results consistent with the aforementioned we experienced in the case study. Factory throughputs, cycle times, product quality and serviceability where all areas that experienced significant improvement; while at the same time the organization has become more flexible through an organizational transformation initiative.

Keywords: agile manufacturing, lean manufacturing, six sigma, lean-six sigma

Communications of SIWN

Volume 4 • June 2008

SIWN Abstracts Index

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Formal Refinement Model of OSGi based System

Jiankun Wu, Linpeng Huang, Dejun Wang

Communications of SIWN, Vol. 4, June 2008, pp. 1-5

Abstract: An ASM-based formal refinement model for OSGi based system is presented in this paper. The model not only provides the refinement methods but also gives the refinement verification between two ASMs. Finally, the final model that specifies the constraint of OSGi is obtained. The goal of the model is the development of correct software for safety critical applications. From requirement to implement, the stepwise refinement will be under rigorous proving. The trust of the objective system will be guaranteed by the refinement model.

Keywords: refinement, Abstract State Machine (ASM), OSGi, verification, coupling invariant.

sai: cosiw.2008.06.162

FUNGO: An Algorithm to Derive Local Interaction Protocols from WS Choreographies

Roberto Furnari

Communications of SIWN, Vol. 4, June 2008, pp. 6-10

Abstract: This paper presents FUNGO, an algorithm that, given a complex service definition (as a Web Service choreography model), checks if it can be correctly implemented by the local models of the single services participating in it. When the local models do not fulfil some synchronization constraints defined in the global choreography, the algorithm adjusts them by adding synchronization messages that guarantee that their execution actually implements the interactions required by the choreography definition. The algorithm is part of the PERCHE choreography registry, that extends the idea of UDDI registry to the management of web service choreographies.

Keywords: Choreography, Web Services, SOA, Service Interoperability, Business Process Integration, Synchronization.

sai: cosiw.2008.06.163

BDI Agent-Oriented Design for Distributed Intrusion Detections

Dayong Ye, Quan Bai and Minjie Zhang

Communications of SIWN, Vol. 4, June 2008, pp. 11-17

Abstract: Many research works on application of intelligent agents in intrusion detection have been done in the past decade. However, they mostly focus on designing a general architecture of agent-based intrusion detection system rather than the intelligent behaviour of agents. In this paper, the design and implementation of Belief-Desire-Intention agents in a Mobile Agent-based Peer-to-Peer Distributed Intrusion Detection Framework (MADIDF) are introduced. In addition, an example which demonstrates the interaction among different agents on different hosts when there is a suspicious distributed attack is also presented. Compared to current related research, MADIDF implements a novel P2P distributed intrusion detection framework, so it can detect attack not only on a single host but also in a distributed domain.

Keywords: BDI Agent, Distributed Intrusion Detection.

sai: cosiw.2008.06.164

Semantics Supported Access Authorization Based on Decentralized Architecture

Mohammad M. R. Chowdhury, Josef Noll and Najeeb Elahi

Communications of SIWN, Vol. 4, June 2008, pp. 18-24

Abstract: Access authorization is one of the ways to provide information security and privacy assurance. This paper proposes an access authorization mechanism in organizations based on decentralized architecture. It includes decentralized organizational structures containing various attributes which are formally represented using the Web Ontology Language. Access authorization decisions are derived through semantic rules and queries. The proposed architecture is compared with its centralized counterpart and with the relational database approach from the computational complexity, management and maintenance point of views.

Keywords: access authorization, decentralized architecture, ontology, rule, semantic.

sai: cosiw.2008.06.165

Research of Modeling and Application on Multi-Agent System Using Petri Nets

Liang Chen, Zhijun Yan and Jiajia Liu

Communications of SIWN, Vol. 4, June 2008, pp. 25-28

Abstract: In a multi-agent system, how agents accomplish a goal task is usually specified by multi-agent plans built from basic actions (e.g. operators) of which the agents are capable. The processes of modeling multi-agent system are hindered by the agent character like autonomy, social ability, reactivity, pre-activeness etc. To make up the flaw of former modeling methods,

this paper presents a formal approach called AOPN (Agent Oriented Petri Net) for analyzing and modeling multi-agent behaviors using Petri nets. The formalized description of AOPN model is given and an example is presented to make the model be understood more clearly.

Keywords: multi-agent system, Petri nets, modeling

sai: cosiw.2008.06.166

Colored Petri Net Based Scheduling for Agent-Based Grid Systems

Quan Bai and Minjie Zhang

Communications of SIWN, Vol. 4, June 2008, pp. 29-33

Abstract: Scheduling is one of the most important issues in the area of Grid computing. How to efficiently schedule computing jobs to the distributed, heterogeneous and dynamic computing resources is a key challenge in most Grid implementations. As a powerful artificial intelligence technology, intelligent agent shows considerable promise as a new paradigm for building open systems. In this paper, we target at agent based Grid Computing Systems, and present a Colored Petri Net based strategy for Grid scheduling. Comparing to the existing scheduling strategies, the new strategy is leveraged by the intelligent agents and Colored Petri Nets, therefore is more efficient and flexible for open environments.

Keywords: Grid, multi-agent system, colored Petri net, scheduling, resource management.

sai: cosiw.2008.06.167

Discovering and Exchanging Information About Users in a SOA Environment

Federica Cena and Roberto Furnari

Communications of SIWN, Vol. 4, June 2008, pp. 34-38

Abstract: This work describes a framework providing a complete solution for the discovery and exchange of information about users in an open dynamic environment. The framework is built on a SOA-based environment where standard Web Service technologies are exploited to achieve syntactic interoperability and Semantic Web languages are used to achieve semantic interoperability. A central enhanced-UDDI registry is used to support the discovery and cooperation between applications. The exchange of information between systems takes place in a P2P way, by means of atomic communication (if systems share the same knowledge model) or by means of negotiation techniques based on dialogue (in case of different knowledge models).

Keywords: User Model Interoperability, Service-Oriented Architecture, Web Services, Semantic Web, Dialogue.

sai: cosiw.2008.06.168

A Condition Formula Search

Toshio Kodama, Tosiyasu L. Kunii and Yoichi Seki

Communications of SIWN, Vol. 4, June 2008, pp. 39-44

Abstract: Cyberworlds are distributed systems where data and their dependencies are constantly changing and evolving. In such business application systems, combinatorial explosion happens because you must modify schemas and application programs whenever schemas change, if you use existing techniques. To solve the problem, we have developed a data processing system called Cellular Data System (CDS) based on the cellular model, which is considered the most appropriate to model cyberworlds, using an algebra system called Formula Expression. In this paper, we design and implement a condition formula and its processing maps as an important function in CDS. A condition formula search is a very effective measure when you want to analyze data in cyberworlds without losing consistency in the entire system, since you can search for the data you want without changing application programs, if you employ a condition formula search. That is, a condition formula search is an analysis measure for the worlds under the assumption of frequent changes of schemas. Therefore, if you use CDS, the development process is completely different from the general one, since we do not have to design business specification clearly at requirements analysis. In addition, we demonstrate the effectiveness of a condition formula search by taking up an example of a photo file management system.

Keywords: cyberworlds, cellular model, formula expression, topological space, cellular space, condition formula

sai: cosiw.2008.06.169

Fuzzy-Controlled Intelligent and Robust Multicast (FIRM) Routing in Mobile Ad Hoc Networks

Anuradha Banerjee and Paramartha Dutta

Communications of SIWN, Vol. 4, June 2008, pp. 45-50

Abstract: In this article we present a protocol for fuzzycontrolled, intelligent and robust multicast (FIRM) routing in mobile ad hoc networks, which establishes and maintains a shared mesh structure for each multicast group, without requiring pre-assignment of core to groups. Using simulations in Qualnet 3.5, we compare FIRM with ODMRP and MAODV which are state-of-the-art representatives of mesh-based and tree-based multicast routing protocols respectively, for mobile ad hoc networks. The results from a wide range of scenario show that FIRM attains higher packet delivery ratio at much lesser cost than ODMRP and MAODV.

Keywords: Ad Hoc networks, routing, multicasting, core, mesh, tree.

sai: cosiw.2008.06.170

Design and Realization of Linux Based Wireless Data Acquisition System

Y. Cheng, Y. Fun Hu, P. Jiang, S. Brown and A. Metcalfe

Communications of SIWN, Vol. 4, June 2008, pp. 51-57

Abstract: This paper presents a wireless sensor system developed for environment monitoring. Both live streaming video (1Mbyte/s) and data sensor signals with a high sampling rate (10Mbytes/s) are required to be transmitted from a mobile station to a monitoring PC in real-time. In order to obtain a 12Mbytes/s wireless data sampling rate, an embedded computer links a video camera and a Cypress signal acquisition board through USB 2.0 ports on the sensor side, whilst IEEE 802.11g is used for wireless communication of sensor signals to the monitoring PC. It is significant in wireless sensor system that the communication link should be reliable for high data throughput. The design and implementation of wireless communication for reliable and real-time sensing applications using the commercial off-the-shelf techniques are reported and discussed in this paper. The factors affecting the performance of data transmission such as the data rate, time delay, packets loss impacted by distance are experimentally investigated through the developed prototype system.

Keywords: data acquisition, Linux based, USB device operation, wireless sensor.

sai: cosiw.2008.06.171

A Pseudo-GA for Estimating Network Traffic Matrices

Hong Tang and Tong-Liang Fan

Communications of SIWN, Vol. 4, June 2008, pp. 58-63

Abstract: A Traffic Matrix (TM) giving the traffic volume between origin and destination nodes in a network has tremendously potential utility for network capacity planning and management. Yet a major challenge remains towards achieving the full potential of traffic matrices. Many pioneer methods assumed the independence among the pairs of origins and destinations in a network, but they are inaccurate. What's more, they didn't consider the relation between the TM and the links. In this paper, the assignment model is developed. In order to make the problem less under-constrained, the key links are analyzed and the relation between TMs is investigated. A new method for practical and rapid inference of traffic matrices in IP networks from link count measurements and routing configuration is proposed. Finally, the accuracy of the algorithm is evaluated.

Keywords: traffic matrix estimation; assignment model; genetic algorithm

sai: cosiw.2008.06.172

Kinetic Parameter Mining of Swarm Behavior Based on Rough Set

Yu Wu, Kai Zhou, Jie Su and Hong Tang

Communications of SIWN, Vol. 4, June 2008, pp. 64-69

Abstract: Emergent intelligence behavior in complexly adaptive system is a hot research field, among which swarm is one of the most typical models. Although some researchers studied on dynamic behaviors of swarms by using control theory, biology theory and some other interdisciplinary methods, their results still lacked quantitative conclusion or knowledge interpretation. In this paper, data mining based on rough set is introduced to study the kinetic parameters of swarm behaviors as well as given swarm model. Firstly, decision table is constructed from swarm kinetic parameters. Then, rule knowledge is achieved via discretization, attribute reduction and value reduction. It expresses the relationship between kinetic parameters and the whole emergent pattern of swarm. Consequently, these kinetic parameters are extended to a range via data mining, and the swarm model is getting more flexible. Simulation under the relevant platform has improved the creditability of the achieved knowledge.

Keywords: emergent, complexly adaptive system, swarm, rough set, kinetic parameters.

sai: cosiw.2008.06.173

A Location-Based Service Using Triangulation with RSSI on a Wireless Sensor Network for the Guidance of the Mobility Handicapped in Subway Stations

Min-hwan Ok and Duck-shin Park

Communications of SIWN, Vol. 4, June 2008, pp. 70-76

Abstract: This work involves the pursuit of a solution to the inconveniences experienced by disabled or older persons when moving through subway stations. A location positioning technique was proposed to build a system that monitors such mobility handicapped individuals. Every node is connected ad hoc, and linked to a monitoring server. Guided information could be offered to such a mobility handicapped individual based on their monitored position information. The monitoring resolution was determined by the gaps between the deployed nodes.

Keywords: location-based service, ubiquitous sensor network, mobility handicapped, triangulation, received signal strength indication.

sai: cosiw.2008.06.174

Predicting Consumer Acceptance of Mobile Advertising in China

Xiang Shen and Huaping Chen

Communications of SIWN, Vol. 4, June 2008, pp. 77-81

Abstract: China has the largest mobile phone subscribers group in the world and mobile advertising industry achieved a rapid development. But there is little empirical study about this market. Based on the theory of planned behavior, this paper builds an integrated research model to understand the acceptance of mobile advertising from consumer perspectives. A survey is developed and the structural equation modeling technique is used to examine the research model. The result supports the research model in predicting consumer acceptance of mobile advertising.

Keywords: mobile advertising, mobile commerce, acceptance, theory of planned behavior, technology acceptance model

sai: cosiw.2008.06.175

Multi Parameter Based Vertical Handoff Decision in Next Generation Networks

Anita Singhrova and Nupur Prakash

Communications of SIWN, Vol. 4, June 2008, pp. 82-87

Abstract: Traditionally, Vertical Handoff Decision Algorithm (VHDA) is based on Received Signal Strength. However, this paper aims to propose multiple parameter based algorithm, where the weight vector decides selection of base stations during Handoff. The calculation of weight vector is most critical part of the vertical handoff decision algorithm implementation. The existing method of determining weight vector by standard deviation is computationally expensive and therefore, a supervised learning based Neuro-Fuzzy approach is proposed for calculation of weight vector. The weight training using neural network is an important feature of proposed VHDA. This paper discusses the Neuro-Fuzzy technique in which fuzzy membership metrics and fuzzy based inference engine is used along with neural network for the weight adjustment in order to improve the overall efficiency of seamless mobility in next generation networks.

Keywords: handoff, mobility management, neuro-fuzzy paradigm, vertical handover decision.

sai: cosiw.2008.06.176

PPFAS: A Port-Pair based Fair Aggregation and Scheduling in SUPANET

Ji Li, Huaxin Zeng and Hao Luo

Communications of SIWN, Vol. 4, June 2008, pp. 88-94

Abstract: Aggregate scheduling can be used to solve the scalability problem in core networks. To meet the multirequirement of Single-layer User-data Switching Platform Architecture Network (SUPANET) on QoS guarantee and high-speed switching, we propose a feasible solution called Port-Pair based Fair Aggregation and Scheduling (PPFAS) which regard all micro-flows transferred through a same portpair in switches as one macro-flow. PPFAS combine CIOQ queuing method with TRSFS scheduling mechanism to build a full distributed CIOQ switch which realizes the independent scheduling of each port. By mathematic analysis and simulations, we show the PPFAS solution having the following features: (1) The buffer demand for each Virtual Input Queue (VIQ) in the switch can be calculated quantitatively, and it is no more than $2N+1$ cells at most, where N is the switch size; (2) The switch delivers the best QoS performance under the modest conditions - unbalance weight is no more than 0.5 and the workload is not above 0.9.

Keywords: aggregate scheduling, QoS, SUPANET, TRSFS, PPFAS.

sai: cosiw.2008.06.177

Integrated Public Transport Monitoring and Information System Using Location Based Services Applications

Norleyza Jailani, Mohd Norfaizi Mihsany, Marini Abu Bakar, Noor Faezah Mohd Yatim, Salha Abdullah

Communications of SIWN, Vol. 4, June 2008, pp. 95-100

Abstract: Mobile communication system has been widely accepted amongst Malaysian users. One of the applications that are becoming popular is Location Based Services (LBS). Location data provided by mobile devices has the potential to expand information services by adding a location dimension. This is particularly true in public transportation information services. In Malaysia, commuters are becoming more dependent on public transports instead of using private vehicles due to the escalating prices of petrol and tolls, and to avoid getting trapped in traffic jams. This paper proposes the architecture of a location-based service for public transportation system which offers information on bus location to mobile users. The system consists of a back-end location data reporting system for gathering real-time position data of the buses and trains, as well as a complete front-end system targeted for mobile commuters and the transport company administration for updating information and monitoring vehicles. Global Positioning System (GPS) devices are used to determine vehicles location data which is then transmitted via Automatic Packet Reporting System (APRS). Commuters may request new updates on transport information service and find places of interest within close vicinity of bus or train stations from their mobile phones.

Keywords: location-based service, mobile application, public transportation

sai: cosiw.2008.06.178

On the Rebroadcast Probability of an Enhanced Counter-Based Broadcast Scheme for Mobile Ad Hoc Networks

Aminu Mohammed, Mohamed Ould-Khaoua, and Lewis M. Mackenzie

Communications of SIWN, Vol. 4, June 2008, pp. 101-105

Abstract: The simplest and commonly used mechanism for broadcasting in mobile ad hoc networks (MANETs) is flooding, where each node retransmits every uniquely received message exactly once. Despite its simplicity, it can result in high redundant retransmission, contention and collision in the network, a phenomenon referred to as broadcast storm problem. Several probabilistic approaches have been proposed to mitigate this problem inherent with flooding. However, majority of these schemes uses fixed rebroadcast probability which is quite unlikely to be optimal in other simulation set up. In this paper, we propose a rebroadcast probability function which takes into account key simulation parameters like network topology size, transmission range and number of nodes in the network in determining appropriate rebroadcast probability for a given node. Simulation results reveal that this simple adaptation achieves superior performance in terms of saved-rebroadcast, number of retransmission node and end to end delay, without sacrificing reachability in dense network.

Keywords: broadcasting, MANETs, flooding, broadcast storm problem, rebroadcast probability, saved rebroadcast, reachability.

sai: cosiw.2008.06.179

An Efficient Rate Control Scheme for Mobile Video Streaming

Peng Lin, Yanbing Liu and Yang Zou

Communications of SIWN, Vol. 4, June 2008, pp. 106-109

Abstract: Mobile video streaming is a technique that the receiver could continuously view the video content while receiving the data. An interactive framework of mobile video streaming is presented in a practical way. To reduce the effects caused by the fluctuation of wireless network, an adaptive rate control method is proposed for priority process streaming with QoS control. The transmitting data rate adapts to a suitable level according to the network status. The bandwidth is dynamically allocated according to the network status, and the client buffer occupancy and playback requirement. The transmission rate is determined by the optimal data rate control algorithm that can obtain the maximal utilization of the client buffer and minimal occupation of the network bandwidth. Simulation scenario has been created to help analyse the behaviour of adaptive streaming over wireless channel. Both cases with and without the proposed methods were examined and the result shows the proposed model is able to improve the overall performance in cases when the channel conditions fluctuate.

Keywords: wireless, adaptive streaming, rate control

sai: cosiw.2008.06.180

Using Contracts for Self-Management

Jens Bruhn and Guido Wirtz

Communications of SIWN, Vol. 4, June 2008, pp. 110-115

Abstract: Enterprise Applications (EA) represent a family of highly complex software systems for supporting the business of companies. For their development and initial configuration, the concept of Component Orientation (CO) provides a sound foundation, leading to software architectures consisting of functionally decoupled components. These are loosely connected through contractually specified interfaces. To facilitate the administration of EAs, the vision of Autonomic Computing (AC) is based on the idea to assign low level management tasks to the system itself. In this paper we present a new approach for self-management based on contracts of interfaces. During runtime, contract adherence is evaluated. For violations, different reactions can be configured, reaching from forwarding erroneous calls over the initiation of rollbacks for confining the effects of already processed requests up to the destruction of affected elements. Our platform specific approach addresses EAs based on the Enterprise Java Beans standard (EJB), version 3.0.

Keywords: enterprise applications, autonomic computing, self-management, design by contract

sai: cosiw.2008.06.181

Adaptive Coalition Structure Generation in Cooperative Multi-agent Systems

Giovanni Rossi and Gabriele D'Angelo

Communications of SIWN, Vol. 4, June 2008, pp. 116-122

Abstract: In multiagent systems a coalition structure is a collection of pair-wise disjoint subsets of agents whose union yields the entire population. Given a characteristic function quantifying the worth of agent subsets, searching for optimal coalition structures (i.e. where the sum of subsets' worth is maximal) is a well-known NP-hard combinatorial optimization problem. While existing algorithms (either deterministic or stochastic) deal with time-invariant goal functions, the focus here is on dynamic settings, where the worth of agent subsets possibly varies over time in an unknown and unpredictable fashion. The aim is to design an adaptive dynamic process generating coalition structures with high worth most of the times. To this end, detecting variations in the worth of agent subsets becomes crucial. The proposed method takes into account such (possible) changes by intensifying the exploration activity whenever they are detected. The performance with respect to the worth of optimal coalition structures is evaluated through simulations.

Keywords: Adaptive Coalition Structure Generation, Coalitional Game, Simulation, Dynamic and Non-superadditive Environment, Cooperative Multiagent System.

sai: cosiw.2008.06.182

Self-Organised Service Network for Dynamic Logistics: Framework and Case Study

Alexander Smirnov, Nikolay Shilov, Tatiana Levashova and Alexey Kashevnik

Communications of SIWN, Vol. 4, June 2008, pp. 123-127

Abstract: The objectives of the research presented in the paper are to provide a means for efficient logistics management in decentralised environment taking into account ever-changing environment of logistics activities. The research addresses these objectives proposing a contextaware decision support system (DSS) for dynamic logistics. The DSS is implemented as a set of Web-services. The paper proposes a methodology describing main principles of building such DSSs and DSS architecture. Real-time modelling of logistics situations and solving problems of dynamic logistics are carried out by a set of Web-services, which self-organise a service network according to the context. The architecture presents a set of Web-services making up the DSS. The methodology is demonstrated by an example of solving routing and transportation planning problems applied to disaster relief actions.

Keywords: self-organised service networks, web-services, service-oriented architecture, context-aware decision support, dynamic logistics, disaster relief

sai: cosiw.2008.06.183

A Self-organizing Algorithm for Mobile Agents Formation Control

Miguel A. Sánchez-Acevedo, Ernesto López-Mellado and Félix Ramos-Corchado

Communications of SIWN, Vol. 4, June 2008, pp. 128-132

Abstract: This paper addresses the problem of establishing and maintaining structured formations of physical mobile agents using self-organization strategies. Formations are achieved through information obtained from local interactions and, if it is necessary, the formation is balanced when new elements are integrated to the group; furthermore the position of mobile agents

is not defined a priori. A Petri net based methodology for obtaining the algorithm is proposed. Simulations were performed in wedge formation to validate the proposed approach.

Keywords: mobile agent formation, self-organization strategies, Petri nets

sai: cosiw.2008.06.184

Digital Semiochemical Coordination

Holger Kasinger, Jörg Denzinger and Bernhard Bauer

Communications of SIWN, Vol. 4, June 2008, pp. 133-139

Abstract: Indirect interactions by olfactory stimuli between living organisms are a powerful mechanism for self-organizing coordination in biology. Various adoptions of this paradigm for computer systems however are mainly based on the usage of digital pheromones, although these chemical substances are only one type that mediate indirect interactions. Biology provides an ingenious diversity of such substances, all grouped by the term semiochemicals. In this paper we adopt the principles behind semiochemical coordination in biology and present a model that defines a coarse-grained architecture of selforganizing computer systems based on indirect interactions. This model allows for any combination of semiochemical coordination mechanisms within one single system architecture, which will pave the way for an easier engineering of selforganizing solutions better adapted to complex problems. We further demonstrate how to efficiently combine different types of semiochemical coordination into one mechanism, based on pollination in biology, and evaluate its application to instances of pickup and delivery problems.

Keywords: biologically-inspired, decentralized coordination, engineering self-organizing emergent systems.

sai: cosiw.2008.06.185

On the Encapsulation and Reuse of Decentralized Coordination Mechanisms: A Layered Architecture and Design Implications

Jan Sudeikat; and Wolfgang Renz

Communications of SIWN, Vol. 4, June 2008, pp. 140-146

Abstract: The effective and reliable coordination of agent activities is a momentous problem for Multi-Agent System (MAS) developers. Particularly challenging is the decentralized coordination of agents that enables systems to exhibit self-organization. Natural phenomena typically serve as design metaphors and developers apply Decentralized Coordination Mechanisms (DCMs) that have been inferred from biological, physical or social systems. This paper addresses the utilization of DCMs as reusable software components. Current development practices give little guidance for DCM selection and force developers to manually design, implement and tune mechanism parameters ad hoc, leading to highly specialized algorithms. Here, we propose a layered software architecture that encapsulates DCMs in (multiple) coordination spaces. A generic, annotation-based interface allows to separate agent coordination from agent functionality, therefore enabling DCM reuse and facilitating application (re)designs, i.e. mechanisms exchange and parameter adjustments. Implications for development procedures are discussed and the application of the layered architecture is exemplified in a resource allocation case study.

Keywords: decentralized coordination, coordination mechanism reuse, feedback, multi-agent system, self-organization.

sai: cosiw.2008.06.186

Global Order From a Minimal Local Resource Allocation Strategy

Mariusz Jacyno, Seth Bullock, Terry Payne and Michael Luck

Communications of SIWN, Vol. 4, June 2008, pp. 147-152

Abstract: In this paper we explore the relationship between local and global behaviour in a simple model of utility computing infrastructure as the system heterogeneity, load and reliability are varied. To do this, we implement minimally complex agent strategies for which we can identify the fundamental generic feedback underlying system behaviour. Such feedback must be balanced by any utility computing infrastructure if decentralised control is to become an effective technique for preserving stable functionality.

Keywords: decentralised control, multi-agent system, selforganisation, decentralised resource allocation

sai: cosiw.2008.06.187

A Social Reinforcement Teaching Approach to Social Rules

Jose Fabregat-Pinilla, C. Carrascosa and Vicente J. Botti

Communications of SIWN, Vol. 4, June 2008, pp. 153-157

Abstract: Reinforcement Learning has been an active research field both in the intelligent agents area and game theory for many years. The application to multi-agent systems is more recent but very promising. A social setting has inherent problems for a reinforcement learning agent, such as the allocation of reward between the agents or the convergence to a policy in a non-stationary setting. However, it has also much to offer to the multi-agent community. A social setting as an environment to be learnt is characterized by the agents that inhabit it. A learning agent can learn how to interact and collaborate with other agents or which rules regulate the social setting. In this paper explicit reinforcement teaching is proposed as a way to teach the set of social rules to a new agent in a social environment. Social reinforcement between agents, combined with trust, are used as a way to learn social rules or to emerge them from the interaction. A case study has been developed to test the validity of the presented approach, teaching a set of social rules to new agents that become then teachers themselves.

Keywords: multi-agent systems, social learning, reinforcement learning

sai: cosiw.2008.06.188

Autonomic Computing: Exploring Self-Organization and Self-Configuration Using Models of Excitable Media

Luis M. Fernández-Carrasco, Hugo Terashima-Marín, and Manuel Valenzuela-Rendón

Communications of SIWN, Vol. 4, June 2008, pp. 158-162

Abstract: This research paper explores the idea to use models of excitable media in order to get two characteristics autonomic computing systems must have: self-organization and self-configuration. Excitable media is capable of modeling complex coherent actions using simple rules; thus, reducing the difficulty and effort that, so far, the design of autonomic systems has shown. In order to delve into this idea, an excitable environment that holds autonomous agents was built, and a study of how exciting this world affects the behavior of these agents was conducted. The obtained results open the doors to a new way to design autonomic systems, more specifically, autonomic systems modeled after excitable media.

Keywords: autonomic computing, self-organization, agentbased modeling, excitable media

sai: cosiwn.2008.06.189

Multi-layer Coordinated Adaptation Based on Graph Refinement for Cooperative Activities

Ismael Bouassida Rodriguez, Nicolas Van Wambeke, Khalil Drira, Christophe Chassot, and Mohamed Jmaiel

Communications of SIWN, Vol. 4, June 2008, pp. 163-167

Abstract: Future network environments are likely to be used by cooperative applications. Indeed, the recent advent of peer-to-peer systems motivates this assumption. In this paper, we present a method that relies on graphs and graph grammar productions to automatically refine a high level service interactions representation of an activity into a deployment topology at the Middleware and the Transport level. At both levels, algorithms for service optimization are presented. The different models and algorithms are implemented in a case study of CMS-like operations for crisis management.

Keywords: dynamic re-configuration, self-adaptation, graphgrammar, context awareness, cooperative activities

sai: cosiwn.2008.06.190

Management-by-Exception - A Modern Approach to Managing Self-Organizing Systems

René Schumann, Andreas D. Lattner and Ingo J. Timm

Communications of SIWN, Vol. 4, June 2008, pp. 168-172

Abstract: A well established design technique for software systems is to define their application context and its behavior in all possible scenarios. Those systems are typically deterministic in terms of their reaction to inputs from their environment. A disadvantage of those systems is their lack of flexibility. They fail when they have to work in a context not regarded at design time. It was shown that multiagent systems can offer such a flexibility. But from an external position their behavior cannot always be anticipated, which in fact is a major obstacle using this technology in commercial applications. Therefore, we propose an approach that combines the advantages of deterministic behavior and flexibility. We use a multiagent system with an internal management structure. Using the management-by-exception approach allows a maximum of local decision freedom and therefore of flexibility, while ensuring an acceptable overall system performance.

Keywords: strategic management, multi-agent system, selforganization, management-by-exception

sai: cosiwn.2008.06.191

A Service-Driven Approach for Sensor Web Progressive Self-Organization

Nafaâ Jabeur and Youssef Iraqi

Communications of SIWN, Vol. 4, June 2008, pp. 173-177

Abstract: Several works have addressed the issue of selforganization in distributed systems such as sensor webs (SWs). However, straightforward SW self-organization is still extremely difficult. Moreover, SWs are moving toward supporting multiple services. In this context, we tackle the problem of self-organization using a service-driven approach. Since several services can be deployed simultaneously, the SW can be seen as the overlap of active Service-Oriented Subnets (SOSs). Each SOS results from a self-organizing effort during which relevant sensors collaborate for the provision of a particular service. In the proposed architecture, the SW is modeled as a Multi Dynamic Spatial Information Grid (MDSIG), where every DSIG, implemented by a specific SOS, is an infrastructure that has the capability of providing a service on-demand. Using the MDSIG and SOS concepts, we propose an innovative Progressive Self-Organization (PSO) approach to implement SW self-organization.

Keywords: dynamic spatial information grid, sensor web, service-oriented subnet, progressive self-organization.

sai: cosiwn.2008.06.192

Model Driven Autonomic Software Development Support

Y. Abuseta and A. Taleb-Bendiab

Communications of SIWN, Vol. 4, June 2008, pp. 178-182

Abstract: Despite the rapid advancements in autonomic systems research and development their design and engineering support is still under active research. This paper presents our early findings towards the development of a proposed Model Driven Development (MDD) method for autonomic software. This method distinguishes itself from other similar MDD methods, in that it provides support starting from the upstream stage of intention (goal or business process) definition to the downstream stages of code generation. This has the advantage over others to providing transformations and mappings starting from the business process layer to the service and component layers. The paper starts with a brief review of model-driven development for autonomic systems. This is followed by a detailed description of the proposed method, which is illustrated with a simplified proof of concept development example. The paper concludes with general critical review of the method including proposed further work.

Keywords: autonomic systems, domains, MDD, service, tasks.

sai: cosiw.2008.06.193

Inter-Operating Grid Workload Framework with Node Autonomy

Wei Liu, José Cunha, Vitor Duarte and Tiejian Luo

Communications of SIWN, Vol. 4, June 2008, pp. 183-188

Abstract: The Grid provides us a way to utilize distributed and heterogeneous resources to benefit the next generation of scientific research. While many grids are currently supporting the work of many scientists, the approach on how to sense a complex grid system is still under developing. Considering the explosively growing amount of data during monitoring and the dynamic context of the grid computing environment, we cannot expect the monitor to fulfill its responsibility in a independent, centralized way, without diverse, flexible and scalable access capability. To address this problem, this paper proposes an interoperable workload model towards developing a Grid Workload Community (GWC). It decouples the workload module from the complex grid environment and makes the interconnected performance traces configurable, self-adaptive, thus reusable to other grid systems. With this design, we can discover and share the grid workload in a more timely way among the federated grid nodes. This model eases the process to collect, analyze, transfer and use the grid performance data and guarantees the grid workloads are managed in a decentralized interoperable way.

Keywords: grid; workload modeling; performance benchmark.

sai: cosiw.2008.06.194

Influence of Defined Parameters in Stability of Class Number in Unsupervised Learning

B. Tighiouart

Communications of SIWN, Vol. 4, June 2008, pp. 189-193

Abstract: The electric activity of the heart indicated by the appearance, on the electrocardiogram tracing (ECG), of wave called P, Q, R, S and T. The wave demarcation is a very important phase of the signal analysis. Besides it constitutes a previous step to the parameters extraction. The precision of calculated parameters then of the diagnosis depends on that. Most of the ECG wave boundaries detection algorithms are based on the matching of a one-dimensional detection function against a standard template computed from an expert controlled reference data set. Because of the variety of ECG, in this paper, we propose to enhance the method by first stratifying the shapes of the detection functions in the vicinity of the waveform boundaries into K shape specific classes by means of a Kohonen self organizing neural network. However accuracy detection of boundary of ECG depends on determinate classes. Stability of class number is based on the learning parameters of classification algorithm. In this work we show the influence of learning parameters values on the quality of determined classes (or learning process).

Keywords: Kohonen map, self organizing, signal ECG, unsupervised learning.

Communications of SIWN

Volume 3 • June 2008

Author Index

Abdul-Ghafour, Samer	189	Marshall, Stephen	113
Addis, Andrea	83	Matsuura, Saeko	166
Armano, Giuliano	83	Meng, Ke	145
Bányász, Cs.	125	Milanesi, Luciano	107
Bargiela, Andrzej	76	Moreno, Antonio	65
Barnaghi, Payam M.	76	Ning, Hong	53
Barriga, Angel	135	Niwe, Moses	22
Buttermann, Garry	39	Ogata, Shinpei	166
Chang, Lily	58	Perna, Eliane	189
Cheng, JiuJun	173	Perondi, Sandra	88
Ciofani, Gianni	88	Qi, Rongbin	140, 145, 155, 160
Cooper, K.	70	Qian, Feng	118, 140, 145, 155
Dazeley, Richard	1	Saeed, Ather	1
Deng, Shengchun	27, 184	Sandkuhl, Kurt	15
Ding, Junhua	58	Schönberger, Jörn	7
Du, Wenli	140	Seigerroth, Ulf	15
Gaglianese, Anna	88	Shariat, Behzad	189
Germain, Richard	39	Shatz, Sol M.	58
Ghodous, Parisa	189	Steiner, R.	70
Gómez-Alonso, Cristina	65	Stirna, Janis	15
Haghpanah-Jahromi, Y.	70	Stranieri, Andrew	1
Hariri, Anas	46	Sun, Chengzhu	27, 184
He, Xudong	58	Sun, Ping	150
Herfurth, Maik	32	Tabary, Dimitri	46
Hu, Cuiyun	53	Tagina, Moncef	130
Husain, Wahidah	95	Tang, Xianfei	173
Hussein, Nashaat M.	135	Tianfield, Huaglory	140
Isern, David	65	Trunko, Ralf	32
Iyer, Karthik	39	Vargiu, Eloisa	83, 107
Jia, Jianfang	102	Wang, Cheng	173
Jiang, Changjun	173	Wang, Honggang	145
Jung, Won Hee	179	Wang, Hui	118
Karimi, Yousef Mohammad	194	Wang, Ji	53
Karle, Thomas	32	Wei, Wang	76
Keviczky, L.	125	Xu, Xiaofei	27, 184
Kim, Sung Ho	179	Yang, Xiaozong	160
Klaib, Ahmad Fadel	95	Yu, Jin	155
Kolski, Christophe	46	Yu, Le	113
Kopfer, Herbert	7	Yue, Hong	102
Landi, Alberto	88	Zainol, Zurinahni	95
Ledda, Filippo	107	Zalila-Wenkstern, R.	70
Lee, Kwang Yun	179		
Lejri, Ons	130		
Lepreux, Sophie	46		
Li, Xiangyang	27, 184		
Liu, Hongwei	160		
Liu, Kun	150		
Lundqvist, Magnus	15		
Luo, Na	140		
Ma, Liping	1		
Ma, Tianyi	160		
Maeng, Jwa Young	179		
Mannini, Andrea	88		
Mao, Xinjun	53		

Communications of SIWN

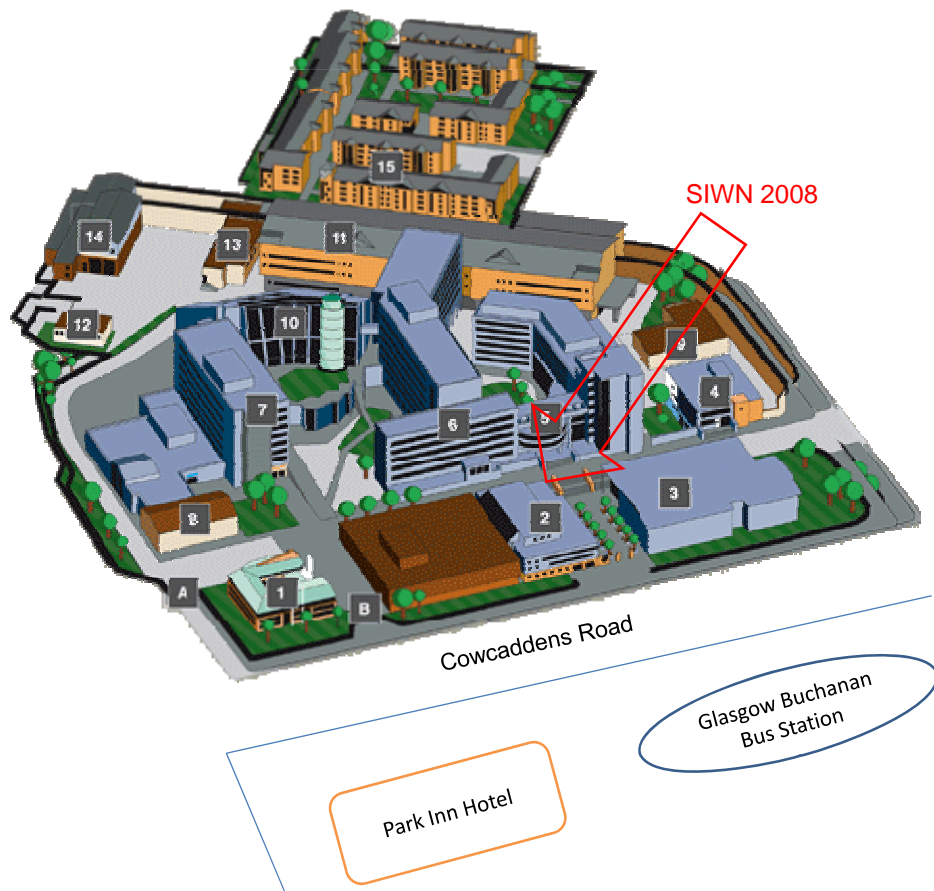
Volume 4 • June 2008

Author Index

Abdullah, Salha	95	Mihsany, Mohd Norfaizi	95
Abuseta, Y.	178	Mohammed, Aminu	101
Bai, Quan	11, 29	Noll, Josef	18
Bakar, Marini Abu	95	Ok, Min-hwan	70
Banerjee, Anuradha	45	Ould-Khaoua, Mohamed	101
Bauer, Bernhard	133	Park, Duck-shin	70
Botti, Vicente J.	153	Payne, Terry	147
Brown, S.	51	Prakash, Nupur	82
Bruhn, Jens	110	Ramos-Corchado, Félix	128
Bullock, Seth	147	Renz, Wolfgang	140
Carrascosa, C.	153	Rodriguez, Ismael Bouassida	163
Cena, Federica	34	Rossi, Giovanni	116
Chassot, Christophe	163	Sánchez-Acevedo, Miguel A.	128
Chen, Huaping	77	Schumann, René	168
Chen, Liang	25	Seki, Yoichi	39
Cheng, Y.	51	Shen, Xiang	77
Chowdhury, Mohammad M. R.	18	Shilov, Nikolay	123
Cunha, José	183	Singhrova, Anita	82
D'Angelo, Gabriele	116	Smirnov, Alexander	123
Denzinger, Jörg	133	Su, Jie	64
Drira, Khalil	163	Sudeikat, Jan	140
Duarte, Vitor	183	Taleb-Bendiab, A.	178
Dutta, Paramartha	45	Tang, Hong	58, 64
Elahi, Najeeb	18	Terashima-Marín, Hugo	158
Fabregat-Pinilla, Jose	153	Tighiouart, B.	189
Fan, Tong-Liang	58	Timm, Ingo J.	168
Fernández-Carrasco, Luis M.	158	Valenzuela-Rendón, Manuel	158
Furnari, Roberto	6, 34	Van Wambeke, Nicolas	163
Hu, Y. Fun	51	Wang, Dejun	1
Huang, Linpeng	1	Wirtz, Guido	110
Iraqi, Youssef	173	Wu, Jiankun	1
Jabeur, Nafaâ	173	Wu, Yu	64
Jacyno, Mariusz	147	Yan, Zhijun	25
Jailani, Norleyza	95	Yatim, Noor Faezah Mohd	95
Jiang, P.	51	Ye, Dayong	11
Jmaiel, Mohamed	163	Zeng, Huaxin	88
Kashevnik, Alexey	123	Zhang, Minjie	11, 29
Kasinger, Holger	133	Zhou, Kai	64
Kodama, Toshio	39	Zou, Yang	106
Kunii, Tosiyasu L.	39		
Lattner, Andreas D.	168		
Levashova, Tatiana	123		
Li, Ji	88		
Lin, Peng	106		
Liu, Jiajia	25		
Liu, Wei	183		
Liu, Yanbing	106		
López-Mellado, Ernesto	128		
Luck, Michael	147		
Luo, Hao	88		
Luo, Tiejian	183		
Mackenzie, Lewis M.	101		
Metcalf, A.	51		

Campus Map of Glasgow Caledonian University

<http://www.gcal.ac.uk/the-university/global/contactmaps/campus.html>



1. Britannia Building
- 2. William Harley Building and CPD Centre**
3. Arc
4. North Hanover Street Building
5. Govan Mbeki Health Building
6. George Moore Building
7. Hamish Wood Building
8. Students' Association
9. Occupational Health Unit
10. The Saltire Centre
11. Charles Oakley Laboratories
12. Nursery
13. Teaching Block
14. Milton Street Building
15. Caledonian Court Accommodation

- A. Vehicle entrance from Cowcaddens Road
- B. Pedestrian entrance from Cowcaddens Road