

# Conference Program



## **RuleML-2008** **International RuleML Symposium on** **Rule Interchange and Applications**

**Orlando, Florida**  
**October, 30-31, 2008**



**Co-located with**  
**11<sup>th</sup> Business Rules Forum**

**Sponsored by**  
**Vulcan Inc, Model Systems, STI Innsbruck, ruleCore,**  
**JBoss**

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**SMCS TC on Intelligent Internet Systems, IEEE SMCS TC on**  
**Distributed Intelligent Systems, IEEE Computer Society TC on**  
**Autonomous and Autonomic Systems, Springer, MoDo**  
**Marketing**

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## Disclaimer

As organizers of RuleML-2008 we are making every effort to make it an enlightening and enjoyable experience for participants. However, we can not take responsibility for any damage, loss or inconvenience participants might incur in connection with the symposium. In addition, the organizers can not be held responsible for the correctness or appropriateness of the talks, papers, panels, tutorials and demonstrations included in the symposium. In particular, changes to the published symposium program or cancellation of parts thereof do not entitle participants to a full or partial refund of the symposium fee.

Any personal/business information supplied to the symposium will be used by the symposium organization for the purposes of symposium registration and administration. Names and addresses of attendees will be processed electronically and included in a list of participants that may be posted and/or distributed during and in connection with the symposium. In addition, this information may also be made available for purposes beneficial to the scientific community such as informing attendees of relevant related publications, events, or items of interest to the community. By registering for the symposium, participants give their consent for such uses of their personal/business information.

## Additional Help & Information

If you need help with registration, hotel, tours, etc. and when the symposium registration desk is closed, please contact the RuleML-2008 organizers.

E-mail: [ruleML2008@easychair.org](mailto:ruleML2008@easychair.org)

## **Welcome to RULEML-2008**

Welcome to the 2008 International Symposium on Rule Interchange and Applications (RuleML-2008) organized by the RuleML initiative, and welcome to Orlando, Florida. We are delighted to provide the venue and facilities for what we hope will be a stimulating and successful event. RuleML-2008 is the second symposium (after last year's highly successful RuleML-2007) devoted to work on practical distributed rule technologies and rule-based applications.

After a series of successful RuleML workshops and then conferences the RuleML Symposium is a new kind of event where the Web Rules and Logic community joins the established, practically oriented Forum of the Business Rules community to help cross-fertilizing between Web and Business Logic technology. The goal of RuleML-2008 is to bring together rule system providers, representatives of, and participants in, rule standardization efforts and open source rules communities, practitioners and technical experts, developers, users, and researchers, who attended an exciting venue to exchange new ideas, practical developments and experiences on issues pertinent to the engineering, management, integration, interoperation, interchange and application of rules in open distributed environments such as the Web.

This year from 35 submitted papers, 10 full papers, which presented solid work in advancing and assessing the state of the art in rule-based systems, including event processing systems; 3 abstracts of 4 invited keynotes; 10 short papers, which presented innovative ideas, approaches, and implementations; and 2 demo papers accompanying the 8 demo presentations of practical applications at the RuleML-2008 Challenge session were selected for the printed proceedings.

The symposium opens on 30<sup>th</sup> October with its regular program and closes on the evening of 31<sup>st</sup> October. In several keynote talks renowned speakers give presentations about "up-to-date" topics that pose challenges to industry, technology development and research:

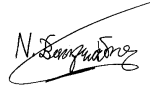
1. Paul Haley (Haley Systems, Inc) on "Event and Process Semantics will Rule".
2. David Luckham (Stanford University, USA) on "The Power of Events: An Introduction to Complex Event Processing in Distributed Enterprise Systems".
3. Michael Kifer (State University of New York at Stony Brook, USA), on "Rule Interchange Format: The Framework". Joint keynote between RuleML-2008 and RR2008.
4. Benjamin Grosf (Vulcan, Inc.) on "Hyper Logic Programs in SILK: Redefining the KR Playing Field for Business and VLKB".

The program also includes a boxed lunch panel discussion on "Rules on the Web" featuring prominent and visionary speakers", a Challenge with prestigious prizes, a special invited session on Rule Standards, and a special invited session with demos. An excellent technical program is a prerequisite for interaction and communication, but it does not suffice unless accompanied by ample opportunities for social encounter such as the breakfasts, the lunches, and social events to promote networking among the symposium delegates in an informal setting. In addition there will be a closing session on Friday evening which will provide an excellent chance for exchanges of ideas on specific topics and planning of future collaborations.

Over the next few days, we hope that everyone participating in the symposium will expand their knowledge and will find useful resources to help with their ongoing work. Most importantly, we hope that by the end of the symposium everyone will have found new friends and partners with whom to work towards new research achievements.



**Adrian Paschke**  
General Chair



**Nick Bassiliades**  
Program Co-Chair



**Guido Governatori**  
Program Co-Chair

## **Symposium Officers and Program Committee Members**

### **General Chair**

**Adrian Paschke, Free University Berlin, Germany**  
paschke@inf.fu-berlin.de

### **Program Co-Chairs**

**Nick Bassiliades, Aristotle University of Thessaloniki, Greece**  
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### **Challenge Co-Chairs**

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badica\_costin@software.ucv.ro

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hu@cs.nccu.edu.tw

### **Panel Co-Chairs**

**John Hall, Model Systems, UK**  
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**Axel Polleres, DERI Galway, Ireland**  
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**Rainer von Ammon, CITT GmbH, Germany**  
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**Jan Vanthienen, Katholieke Universiteit Leuven, Belgium**  
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**Tracy Bost, Valocity, USA**  
tbost@valocity.com

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**Suzanne Embury, University of Manchester, UK**  
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- **Cristina Baroglio, University of Torino, Italy**
- **Claudio Bartolini, HP Labs**
- **Tim Bass, SilkRoad Inc.**
- **Bernhard Bauer, University of Augsburg, Germany**
- **Mikael Berndtsson, University of Skövde, Sweden**
- **Leopoldo Bertossi, Carleton University, Canada**
- **Pedro Bizarro, University of Coimbra, Portugal**
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- **Christopher J. Matheus, Vistology, USA**
- **Craig McKenzie, SAIC Ltd., UK**
- **Jing Mei, IBM Research Lab China, China**
- **Zoran Milosevic, Deontik Inc, Australia**
- **Jang Minsu, E&T Research Institute, Korea**
- **Leora Morgenstern, Stanford, USA**
- **Gero Muehl, Technische Universität Berlin, Germany**
- **Jörg Müller, TU Clausthal, Germany**
- **Chieko Nakabasami, Toyo University, Japan**
- **Ilkka Niemelä, Helsinki University of Technology, Finland**

- **Bart Orriens, Tilburg University, Netherlands**
- **Jeff Pan, University of Aberdeen, UK**
- **Paula-Lavinia Patranjan, Skytec AG, Germany**
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- **Maher Rahmouni, HP Labs**
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- **James Taylor, Fair Isaac Corp., USA**
- **Vagan Terziyan, University of Jyväskylä, Finland**
- **Paul Vincent, TIBCO Software, USA**
- **George Vouros, University of the Aegean, Greece**
- **Kewen Wang, Griffith University, Australia**
- **Mehmet Emre Yegen, Ygntec Inc., USA**

## **The RuleML Initiative**

The RuleML initiative is organised by representatives from academia, industry and government for promotion of the modern and future generations of rule technology, which provides enhanced usability, scalability and performance. The goal of RuleML ([www.ruleml.org](http://www.ruleml.org)) is to be a general and open intermediary between various “specialized” rule vendors, applications, industrial and research working groups and standardization efforts such as OMG PRR or W3C RIF. A general advantage of using declarative rules is that they are usually represented in a machine-readable and platform-independent manner, often using XML. This fits well into today’s distributed, heterogeneous Web-based system environments. Rules represented in standardized Web formats can be discovered, interchanged and invoked at runtime within and across Web systems, and can be interpreted and executed on any platform.



## General Symposium Information

**Conference venue and registration:** RuleML-2008 is co-located with the Business Rules Forum and takes place in:

Buena Vista Palace  
1900 Buena Vista Drive  
Lake Buena Vista, FL 32830  
Toll-Free: 1-866-397-6516  
Tel: (407) 827-2727 Fax: (407) 827-6070  
<http://www.buenavistapalace.com/>

The symposium registration will take place on October, 30th 7 am – 4 pm and on October, 31st 7-8.30 am.

**Finding your way:** From the north end of the airport, take SR-528 (Beeline Expressway toll road) heading west. Merge onto I-4 West. From I-4, take Exit #68, then turn right onto SR-535. Turn left onto Hotel Plaza Boulevard, then right onto E. Buena Vista Drive. Hotel is on the right.

**Help and Support:** If you need help or additional information during the symposium please contact one of the RuleML organizers

**Bank, exchange and credit cards:** Facilities for cashing traveller's cheques are available at banks and at most hotels. Throughout the city there are numerous ATMs available. Most credit cards are accepted in USA.

**Phone** country code for USA is ++1.

**Electricity:** The voltage/frequency in USA is AC 110 volts / 60 Hz with a plug of two pins set parallel to each other. Non US participants need a plug adapter for electrical appliances.

**Time:** Orlando is located in the Eastern Time Zone. In summer the Summer Daylight-Saving Time is in effect: *EDT UTC/GMT -4 hours*

## **Events Associated With RuleML-2008**

**Boxed Lunch Panel Session “Rules on the Web” - Joint with BRF**

**Thursday, October 30th at 12.25 am – 1.45 pm**

**Location: Great Hall North Room (general BRF keynote room)**

**Symposium Dinner**

**Thursday, October 30th at 7.30 pm**

**Location: Nearby restaurant – will be announced during the symposium**

**RuleML-2008 General Open Meeting (open to the public) + Snacks**

**Friday, October 31st at 5.45 - 6.15 pm**

**Location: Great Hall West Room**

**RuleML Steering Committee Meeting (by invitation)**

**Friday, October 31st starting at 6.15 pm**

**Location: Great Hall West Room**

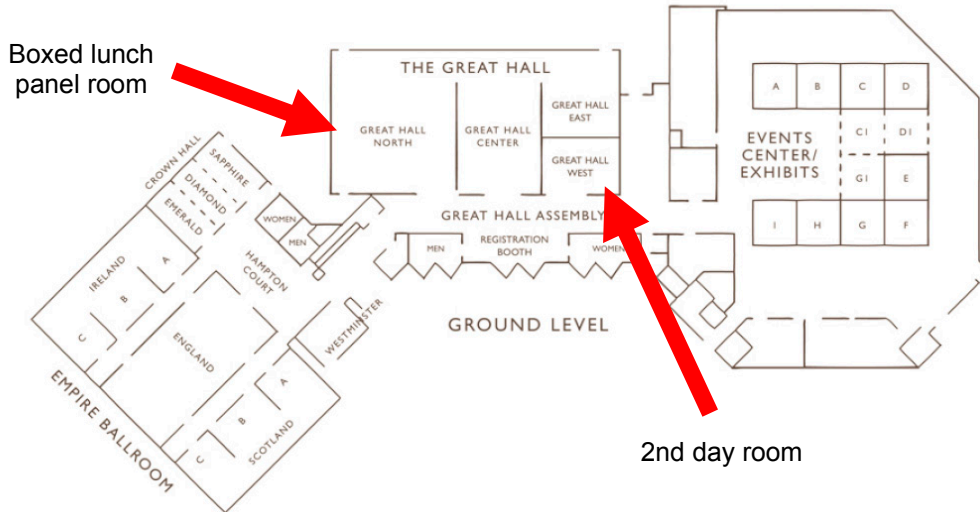
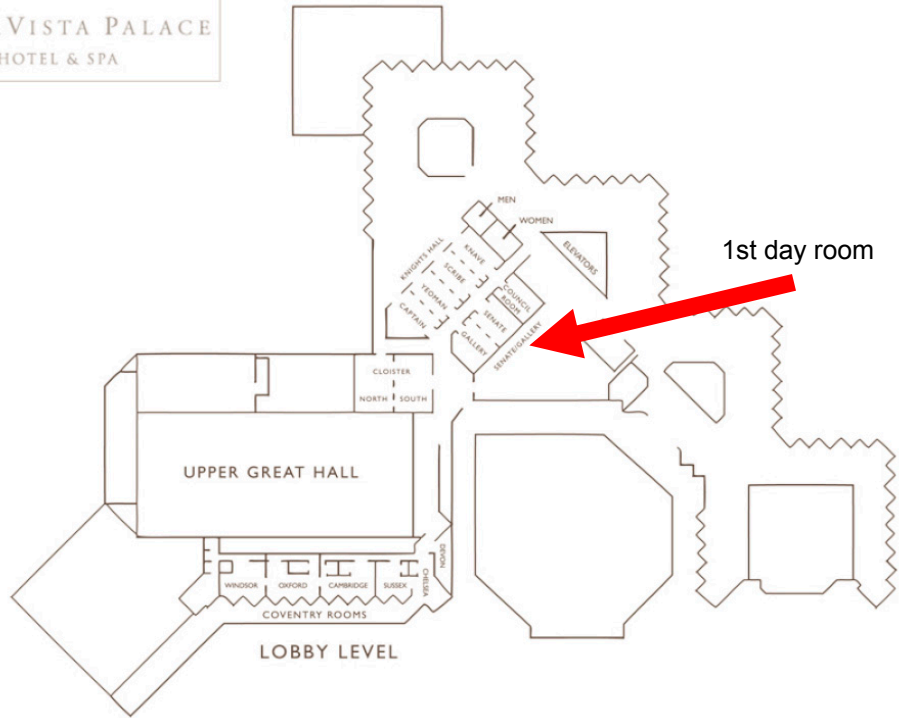
## **Information for Your Visit to Orlando**

**LOCAL ATTRACTIONS** Don't miss this opportunity to visit some of the local attractions including Walt Disney World®, Epcot®, Kennedy Space Center, Sea World, Universal Studios Florida, the Bob Carr Performing Arts Center and much more

**DINING** With hundreds of restaurants within Orlando and surrounding areas including hundreds of top notch eateries within walking distance of the Symposium — it won't take you long to quench your thirst or satisfy even the most discerning diners.

**What's going on in Orlando?** Check out what's happening in Orlando, FL at [OrlandoInfo.com](http://OrlandoInfo.com): the Official Site of the Orlando/Orange County Visitors Bureau.

# Buena Vista Palace Floor Plan



## **Information for Chairing Sessions**

**Introduce yourself to your presenters and remind them to give you their short biography. Before the first speaker is scheduled to begin, introduce the session, introduce yourself and any co-chairs or assistants, make any announcements, and state the session rules. These are generally: (1) Every talk is allotted a total of 30 minutes (15 minutes for short papers), typically 25 minutes of presentation and 5 minutes for questions. (2) Every talk needs to end on time. (3) The chair will signal the speaker when 6 minutes are left (= 1 minute of speaking time) and 1 minute is left of the 30 minute slot**

**Introduce the papers and maintain the schedule times listed in the program.**

**Introduce your presenters using the biography they have given you.**

**In general, please allow the audience to ask questions first before you do. Have a look at the papers in your session and prepare for the discussion.**

## **Information for Presenters**

**Presentation time is:**

- full paper 30 minutes (25 min. presentation + 5 min. Q&A)
- short paper 15 minutes (10 min. presentation + 5 min. Q&A)
- demo 13 minutes (10 min. demo + 3 min. Q&A)

**You can present using your own laptop or bring a CD / USB “memory stick”. Copy your file to the hard drive. Presentation format:**

- Full/Short paper: MS Powerpoint.
- Demo: preferably a live (online) demo

**Biography. Please write a short biography for the chair to use to introduce you. (We suggest 4-6 lines, preferably typed or in block letters).**

**Arrive at the room where your session is being held about 15 minutes before the session**

**Earlier during the symposium, if possible, please go to the room in which you will be presenting in order to copy your presentation files onto the symposium laptop computer. Test it to make sure it runs as expected.**

**Please be considerate to the other speakers: keep to the allowed time.**

## **“Rules on the Web” Boxed Lunch Panel Session**

**Joint with BRF**

**Thursday, October 30th at 12.25 am – 1.45 pm**

**Location: Great Hall North Room (general BRF keynote room)**

**Moderator : John Hall; Director, Model Systems**

2008 sees a major step forward for rules on the Web. The W3C Rule Interchange Format (RIF) Working Group ([www.w3.org/2005/rules/wiki/RIF\\_Working\\_Group](http://www.w3.org/2005/rules/wiki/RIF_Working_Group)) will publish several public working drafts. The OMG has published its beta specification for Production Rules Representation ([www.omg.org/cgi-bin/doc?dtdc/07-11-04.pdf](http://www.omg.org/cgi-bin/doc?dtdc/07-11-04.pdf)), which is being aligned with W3C’s RIF, and will publish the first revision of Semantics of Business Vocabulary and Business Rules (SBVR) in October. RuleML has published drafts on Reaction Rules. People around the world are working on implementations of these specifications. In parallel, business rules are already playing an important role in Web Services. How will new standards and current practice align?

If you are interested in rules on the Web, pick up a boxed lunch and come to this joint BR Forum and RuleML panel session in the BRF keynote room (Great Hall North). Our panel will include specifiers and implementers. Our focus will be: when and how will we use rules on the Web?

### **Panelists:**

**Benjamin Grosf, Vulcan, Inc.**

**Gary Hallmark, Oracle**

**Steve Ross-Talbot, Cognizant Advanced Solutions**

**Mark Linehan, IBM Research**

**Mark Proctor, JBoss (RedHat)**

## Symposium Timetable

October 30th, 2008 (Thursday)	
7.00 am – 4.00 pm	Registration Open
7.00 – 8.00 am	<b>Continental Breakfast</b>
8.00 - 8.15 am	Room Senate/Gallery
	<b>Opening Address from Chairs</b>
8.15 - 09.15 am	Room Senate/Gallery
	<b>Keynote: <i>Event and Process Semantics will Rule</i> by Paul Haley (Haley Systems, Inc.)</b>
9.15 - 10.45 am	Room Senate/Gallery
	<b>Session 1: Rule Engineering</b>
10.45 - 11.00 am	Break
11.00 am - 12.15 pm	Room Senate/Gallery
	<b>Special Invited Session on Rule Standards</b>
12.25 - 1.45 pm	Room Great Hall North
	<b>Boxed Lunch Panel Session: <i>Rules on the Web</i> Joint with BRF</b>
1.45 - 2:45pm	Room Senate/Gallery
	<b>Keynote: <i>The Power of Events - An Introduction to Complex Event Processing in Distributed Enterprise Systems</i> by David Luckham (Stanford University, USA)</b>
2:45 - 3.00 pm	Break
3.00 - 4.30 pm	Room Senate/Gallery
	<b>Session 2: Rule-based Methodologies and Applications in Policies, Electronic Contracts and Security</b>
4.30 – 6.15 pm	Room Senate/Gallery
	<b>RuleML-2008 Challenge</b>
7.30 pm	<b>Symposium Dinner</b>

October 31st, 2008 (Friday)	
7.00 -8.30 am	Registration
7.00 -8.30 am	Continental Breakfast
8.30 - 9.15 am	Room Great Hall West
	Special Invited Demo Session
9.15 - 10.45 am	Room Great Hall West
	Session 3: Rule Representation Languages and Reasoning Engines
10.45-11.00 am	Break
11.00 am - 12:00 pm	Room Great Hall West
	Keynote: <i>Rule Interchange Format: The Framework</i> by Michael Kifer (State University of New York at Stony Brook, USA) Joint with RR2008 – broadcasted from Karlsruhe
12.00 - 1.30 pm	Room Great Hall West
	Session 4: Rule-based Methodologies and Applications in Distributed and Heterogeneous Environments
1.30 - 2.30 pm	Lunch
2.30 - 4.00 pm	Room Great Hall West
	Session 5: Natural-language and Graphical Rule Representation and Processing
4.00 - 4.30 pm	Room Great Hall West
	Best Paper Award, RuleML-2008 Challenge Award
4.30 - 4.45 pm	Break
4.45 - 5:45pm	Room Great Hall West
	Keynote: <i>Hyper Logic Programs in SILK: Redefining the KR Playing Field for Business and VLKB</i> by Benjamin Grosf (Vulcan, Inc.)
5.45-6.15 pm	Room Great Hall West
	Closing Session: Wrap-Up, RuleML General Open Meeting, Snacks
6.15 pm	RuleML Steering Committee Meeting (closed)

## Symposium Program

October 30th, 2008 (Thursday)	
7.00 am – 4.00 pm	Registration Open
7.00 – 8.00 am	Continental Breakfast
8.00 - 8.15 am	Room Senate/Gallery
	Opening Address from Chairs
8.15 - 09.15 am	Room Senate/Gallery
	<b>Keynote: <i>Event and Process Semantics will Rule</i> by Paul Haley (Haley Systems, Inc.)</b> Chair: Nick Bassiliades
9.15 - 10.45 am	Room Senate/Gallery
	<b>Session 1: Rule Engineering</b> Chair: Mark Linehan
	Development and Verification of Rule Based Systems - a Survey of Developers <i>Valentin Zacharias</i>
	Connecting legacy code, business rules and documentation <i>Erik Putrycz and Anatol Kark</i>
	Verifying resource requirements for distributed rule-based systems <i>Natasha Alechina, Brian Logan, Hoang Nga Nguyen and Abdur Rakib</i>
	Meta-Analysis for Validation and Strategic Planning <i>David Ostrowski</i>
10.45 - 11.00 am	Break
11.00 am - 12.15 pm	Room Senate/Gallery
	<b>Special Invited Session on Rule Standards</b> Chair: Gary Hallmark
	OMG Production Rule Representation <i>Paul Vincent</i>
	RIF Production Rule Dialect <i>Christian de Sainte Marie</i>
	An SBVR Vocabulary for Date and Time <i>Mark Linehan</i>
12.25 - 1.45 pm	Room Great Hall North
	<b>Boxed Lunch Panel Session: <i>Rules on the Web</i></b> <i>Joint with BRF</i> Moderator: John Hall
	<i>B. Grosz, G. Hallmark, S. Ross-Talbot, M. Linehan, M. Proctor</i>



October 30th, 2008 (Thursday)	
1.45 - 2:45pm	Room Senate/Gallery
	<b>Keynote: <i>The Power of Events - An Introduction to Complex Event Processing in Distributed Enterprise Systems</i> by David Luckham (Stanford University, USA) Chair: Adrian Paschke</b>
2:45 - 3.00 pm	Break
3.00 - 4.30 pm	Room Senate/Gallery
	<b>Session 2: Rule-based Methodologies and Applications in Policies, Electronic Contracts and Security Chair: Matthias Nickles</b>
	Abductive Workflow Mining using Binary Resolution on Task Successor Rules <i>Scott Buffett</i>
	A Rule-Based Framework to Design Compliant Business Processes Using Role Patterns <i>Akhil Kumar and Rong Liu</i>
	Detection of Suspicious Activity Using Different Rule Engines - Comparison of BaseVISor, Jena and Jess Rule Engines <i>Jakub Moskal and Christopher Matheus</i>
A Rule-based Notation to Specify Executable Electronic Contracts <i>Massimo Strano, Carlos Molina-Jimenez and Santosh Shrivastava</i>	
4.30 – 6.15 pm	Room Senate/Gallery
	<b>RuleML-2008 Challenge Chair: Yuh-Jong Hu</b>
	Storing and Querying RIF Rules in pureXML <i>Susan Malaika</i>
	Please Pass the Rules: A Rule Interchange Demonstration <i>Gary Hallmark, Christian de Sainte Marie, Marcos Didonet Del Fabro, Patrick Albert and Adrian Paschke</i>
	Self-sustained Routing for Event Diffusion in Sensor Networks <i>Kirsten Terfloth and Jochen Schiller</i>
	On Extending RuleML for Modal Defeasible Logic <i>Guido Governatori and Duy Pham</i>
	Building Collaborative Legal Rulebases with Jureeka! <i>Michael Poulshock.</i>
	Deploying a Distributed Symposium Planner Through Rule Responder <i>Benjamin Larry Craig</i>
	PROLOGA: from Business Knowledge Modeling to RuleML <i>Jan Vanthienen</i>

	<b>October 30th, 2008 (Thursday)</b>
	Seamless Software Evolution with Rule Based Control Flow Externalization <i>Urjaswala Vora, Peeyush Chomal, Rahul Upadhyay and Abhishek Tewari</i>
7.30 pm	<b>Symposium Dinner</b>

October 31st, 2008 (Friday)	
7.00 -8.30 am	Registration
7.00 -8.30 am	Continental Breakfast
8.30 - 9.15 am	Room Great Hall West
	<b>Special Invited Demo Session</b> <b>Chair: Robert Golan</b>
	A Wiki for Rules in Executable English, and its Use in Finding Drug Interactions via Automatically Generated SQL <i>Adrian Walker</i>
	Brokering Semantic Web Agents: A Use Case for a Defeasible Reasoning Service <i>Nick Bassiliades</i>
9.15 - 10.45 am	Room Great Hall West
	<b>Session 3: Rule Representation Languages and Reasoning Engines</b> <b>Chair: Scott Buffett</b>
	On Extending RuleML for Modal Defeasible Logic <i>Duy Pham, Guido Governatori, Simon Raboczi, Andrew Newman and Subhasis Thakur</i>
	Adding Uncertainty to a Rete-OO Inference Engine <i>Davide Sottara, Paola Mello and Mark Proctor</i>
	Programming with Fuzzy Logic Rules by using the FLOPER Tool <i>Pedro-Jose Morcillo and Gines Moreno</i>
Ruling networks with RDL: A domain-specific language to task sensor networks <i>Kirsten Terfloth and Jochen Schiller</i>	
10.45-11.00 am	Break
11.00 am - 12:00 pm	Room Great Hall West
	<b>Keynote: Rule Interchange Format: The Framework by Michael Kifer (State University of New York at Stony Brook, USA)</b> Joint with RR2008 – broadcasted from Karlsruhe <b>Chair: Jan Vanthienen</b>
12.00 - 1.30 pm	Room Great Hall West
	<b>Session 4: Rule-based Methodologies and Applications in Distributed and Heterogeneous Environments</b> <b>Chair: Akhil Kumar</b>
	Local and Distributed Defeasible Reasoning in Multi-Context Systems <i>Antonis Bikakis and Grigoris Antoniou</i>
	Personal Agents in the Rule Responder Architecture <i>Benjamin Craig and Harold Boley</i>

October 31st, 2008 (Friday)	
	<p>Semi-automatic Composition of Geospatial Web Services Using JBoss Rules <i>Raluca Zaharia, Laurentiu Vasiliu and Costin Badica</i></p> <p>A RuleML Study on Integrating Geographical and Health Information <i>Sheng Gao, Darka Mioc, Harold Boley, François Anton and Xiaolun Yi</i></p>
1.30 - 2.30 pm	<b>Lunch</b>
2.30 - 4.00 pm	Room Great Hall West
	<b>Session 5: Natural-language and Graphical Rule Representation and Processing</b> <b>Chair: Mark Proctor</b>
	SBVR Use Cases <i>Mark Linehan</i>
	Visualization of Proofs in Defeasible Logic <i>Ioannis Avguleas, Katerina Gkirtzou, Sofia Triantafilou, Antonis Bikakis, Grigoris Antoniou, Efstratios Kontopoulos and Nick Bassiliades</i>
	Building an Autopoietic Knowledge Structure for Natural Language Conversational Agents <i>Kiyoshi Nitta</i>
	A Functional Spreadsheet Framework for Authoring Logic Implication Rules <i>Marcelo Tallis and Robert Balzer</i>
4.00 - 4.30 pm	Room Great Hall West
	<b>Best Paper Award, RuleML-2008 Challenge Award</b>
4.30 - 4.45 pm	<b>Break</b>
4.45 - 5:45pm	Room Great Hall West
	<b>Keynote: Hyper Logic Programs in SILK: Redefining the KR Playing Field for Business and VLKB</b> by Benjamin Grosf (Vulcan, Inc.) <b>Chair: Guido Governatori</b>
5.45-6.15 pm	Room Great Hall West
	<b>Closing Session: Wrap-Up, RuleML General Open Meeting, Snacks</b>
6.15 pm	<b>RuleML Steering Committee Meeting (closed)</b>

## Keynote Speakers

**Keynote 1: Event and Process Semantics will Rule**  
Thursday, October 30, 2008, 8.15 – 9.15 am



**Paul Haley**

Chairman, Haley Systems, Inc.  
President, Automata, Inc.

### Abstract

The convergence of business rules with business process management (BPM) has been predicted for many years and is now a matter of fact. Every major BPM vendor has incorporated or acquired rules technology within their products and platforms. However, most rules offerings are only loosely integrated with processes at the task level. The use of business rules remains largely confined to managing isolated decisions services. Weak integration and isolation effectively relegates rules to an implementing role rather than a first class citizen in the capture and management of enterprise knowledge.

As the largest vendors bring their rules offerings to market and as standards from the W3C and OMG mature to adequacy, the opportunity for vendor-agnostic business rules management systems (BRMS) approaches. And continued improvement in end-user accessibility of BRMS promises ever less technical and ever more semantic expression and management of enterprise knowledge, including process and service models in addition to data models and business rules.

The ability to interchange more semantic models across major vendor offerings promises to dramatically increase the market demand for reusable, enterprise-relevant knowledge. But as knowledge becomes increasingly declarative and independent of implementations, it naturally becomes more ontological. Unfortunately, current ontological technologies are functionally inadequate from a business process or event processing perspective. These inadequacies include the lack of ontology for events, processes, states, actions, and other concepts that relate to change over time. Without such ontologies, rules or logic that govern processes or react to events must remain at the level of procedural implementation rather than declarative knowledge.

Until BRMS understand rules that refer to activities and events occurring within business processes, business rules applications will remain largely confined to discrete decisions, such as encapsulation within a decision service. By incorporating an adequate ontology of events and action, however, the knowledge management capabilities first developed in BRMS will broaden to encompass much of BPM and complex event processing (CEP). Given the fact that BRMS has been incorporated by the dominant platform vendors, modeling should move up from the relatively narrow perspective of a BRMS into the broader context of BPM and CEP.

The migration of business rules management into event and process contexts will emphasize the separation of business rules into ontology versus behavior. Modeling event-driven and business processes will correspond to defining ontology. Implementing event-driven and business processes will invoke behaviors at runtime. The ontology will be the same for BPM, CEP, or the BRMS, as will the behaviors. But the BRMS will know what is happening in terms of events and processes and it will know what processes it can invoke and what events it can signal.

As ontology management becomes increasingly relevant across application development, the limitations of related standards will also come into clearer focus. Commercial BRE are, for the most part, production rule systems that emphasize action over logic. This is best addressed by OMG's production rule representation (PRR) standard. But PRR is an isolated standard that includes no support for ontology or logic. W3C's web-ontology language (OWL) and rule interchange format (RIF) standards address ontology and logic, but not change or action. The same is true of OMG's SBVR, which emphasizes linguistics, in addition to ontology and logic, albeit in a way that remains disconnected with the OMG stack, including PRR.

Bridging events, processes and other aspects of reality that occur and change over time and incorporating action is a fundamental challenge for semantic technologies, especially formal logic, that must be addressed in a practical manner before rules standards and semantic technologies will bear substantial fruit in enterprise contexts.

#### About the speaker

Paul Haley is a veteran software technologist and business developer specializing in Artificial Intelligence with decades of experience selling, developing and applying advanced technology in securities, banking, insurance, healthcare, telecommunications, and government applications. Mr. Haley managed the development of Inference Corporation's Automated Reasoning Tool (ART) from which CLIPS and JESS are derived. Afterwards, he founded Haley Systems which Gartner, IDC, and Forrester recognized as the visionary technology leader in business rules, especially emphasizing natural language management of ontological and rule-based knowledge by non-programmers. After selling Haley to Ruleburst, Paul founded Automata, Inc. which provides services concerning semantic and artificial intelligence technologies.

**Keynote 2: The Power of Events - An Introduction to Complex Event Processing in Distributed Enterprise Systems**

Thursday, October 30, 2008, 1:45 – 2:45 pm



**David Luckham**

**Research Professor of Electrical Engineering (Emeritus)  
Department of Electrical Engineering  
Stanford University, USA**

**Abstract**

This talk is about the rise of Complex Event Processing (CEP) as we know it today, its historical roots and its current position in commercial markets. Some possible long-term future roles of CEP in the Information Society will be discussed along with the need to develop rule-based event hierarchies on a commercial basis to make those applications possible. The talk will try to make the point that "Rules are everywhere" and that mathematical formalisms cannot express all the forms that are in use in various event processing systems.

**About the speaker**

Professor Luckham's research and consulting activities in software technology include multi-processing and business processing languages, event-driven systems, complex event processing, commercial middleware, program verification, systems architecture modelling and simulation, and artificial intelligence (automated deduction and reasoning systems).

He has held faculty and invited faculty positions in both mathematics and computer science at eight major universities in Europe and the United States including Stanford, Harvard and UCLA. Until 1999, he was a member of the Computer Systems Laboratory at Stanford University, and directed the Program Analysis and Verification project. He was one of the founders of Rational Software, Inc., in 1981. He has published four books and over 100 technical papers; two ACM/IEEE Best Paper Awards, several papers are now in historical anthologies and book collections. His latest book is an introduction to complex event processing, *The Power of Events*.

### **Keynote 3: Rule Interchange Format: The Framework**

*Joint with RR2008 – broadcasted from Karlsruhe*

**Friday, October 31, 2008, 11:00 am – 12:00 pm**



**Michael Kifer**

**Department of Computer Science  
State University of New York at Stony Brook, USA**

#### **Abstract**

The Rule Interchange Format (RIF) is a W3C activity aimed at developing a Web standard for exchanging rules. The need for rule-based information processing on the Semantic Web has been felt ever since RDF was introduced in the late 90's. As ontology development picked up pace this decade and the limitations of OWL became more apparent, rules were firmly put back on the agenda. RIF is therefore a major opportunity for the introduction of rule based technologies into the main stream of knowledge representation and information processing.

Despite its humble name, RIF is not just a format and is not primarily about syntax. It is an extensible framework for rule-based languages, called RIF dialects, which includes precise and formal specification of the syntax, semantics, and XML serialization of the dialects. In this talk we will discuss the main principles behind RIF, introduce the RIF extensibility framework, and present the Basic Logic Dialect--the only fully developed RIF dialect so far. We will also discuss the opportunities for community involvement in furthering this standard.

#### **About the speaker**

Michael Kifer is a Professor with the Department of Computer Science, State University of New York at Stony Brook, USA. He received his Ph.D. in Computer Science in 1984 from the Hebrew University of Jerusalem, Israel, and the M.S. degree in Mathematics in 1976 from Moscow State University, Russia.

Professor Kifer's interests include Web information systems, knowledge representation, and database systems. He has published four text books and numerous articles in these areas. Professor Kifer serves on the editorial boards of several computer science journals and chaired a number of conferences. Twice, in 1999 and 2002, he was a recipient of the prestigious ACM-SIGMOD "Test of Time" awards for his works on F-logic and object-oriented database languages. In 2006, he was a Plumer Fellow at Oxford University's St. Anne's College and in 2008 he received Chancellor's Award for Excellence in Scholarship.



**Keynote 4: Hyper Logic Programs in SILK: Redefining the KR Playing Field for Business and VLKB**

Friday, October 31, 2008, 4.45 – 5.45 pm



**Benjamin Grosf**

Senior Research Program Manager, Knowledge Systems  
Vulcan, Inc.

**Abstract**

We overview the approach taken by the SILK system, a new, highly ambitious effort to redefine the knowledge representation (KR) playing field for business rules and rule-based process management. The newest part of Vulcan Inc.'s Project Halo, SILK aims to provide key infrastructure for widely-authored VLKBs (Very Large Knowledge Bases) for business and science that answer questions, proactively supply information, and reason powerfully. SILK includes a highly expressive, fully semantic, rule language based expressively on the Hyper Logic Programs KR, together with components for reasoning, web knowledge interchange, and collaborative knowledge acquisition.

Hyper LP newly synergizes several major strands of pure-research progress in KR based on extensions of declarative logic programs, which are the core KR of RuleML and Rule Interchange Format (RIF) as well as of databases (SQL, XQuery, and SPARQL) and most commercial implementations of OWL ontologies. Hyper LP adds: prioritized defaults cf. courteous and Defeasible Logic; higher-order and frames cf. F-Logic; tight integration of weakened full classical logic (including OWL) cf. generalized Description LP; actions and events cf. production rules, Event-Condition-Action rules, and Situated/Production LP.

Key challenges for SILK include exploiting natural language in user interaction, parallelism in reasoning, and disjunction in expressiveness. We discuss prospects for the SILK approach to effectively interchange and integrate a high percentage of the world's structured knowledge starting from today's legacy forms. "SILK" stands for "Semantic Inferencing on Large Knowledge", what the next generation Web will be spun from.

**About the speaker**

Benjamin Grosf is a senior research program manager at Vulcan Inc., the company of Paul G. Allen (co-founder of Microsoft). There he conceived and leads a new large research program in the area of rule-based semantic technologies and artificial intelligence. Prior to his move to Vulcan in 2007, he was a professor of Information Technology at MIT, in the Sloan School of Management. His research involved the creation of technologies for the new generation web, in which e-services and business communication are more knowledge- and agent-based. In particular, he has pioneered semantic technology and standards for rules, their combination with ontologies, and the Semantic Web. He co-founded the influential RuleML industry standards design effort, and the International Conference on Rules and Rule Markup Languages for the Semantic Web. He was lead inventor of the rule-based technique which rapidly became the currently dominant approach to

**commercial implementation of OWL.**

**Prior to joining MIT Sloan in 2000, he was a senior research scientist, in software, at IBM T.J. Watson Research Center (12 years there), where most recently he conceived and led IBM CommonRules and co-led its application piloting for rule-based XML agent contracting in EECOMS, a \$29 Million NIST industry-government consortium project on manufacturing supply chain collaboration. His notable technical contributions also include fundamental advances in rule-based intelligent agents, conflict handling for rules, rule-based security authorization, and integration of rules with machine learning. He is author of over 50 refereed publications, three major industry software releases, and two patents. His background includes two years in software startups, a PhD in Computer Science (specialty Artificial Intelligence) from Stanford University, and a BA in Applied Mathematics (specialty Economics and Management Science) from Harvard University.**



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