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# Journal on Data Semantics II



Springer

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# **The LNCS Journal on Data Semantics**

Computerized information handling has changed its focus from centralized data management systems to decentralized data exchange facilities. Modern distribution channels, such as high-speed Internet networks and wireless communication infrastructures, provide reliable technical support for data distribution and data access, materializing the new popular idea that data may be available to anybody, anywhere, anytime. However, providing huge amounts of data on request often turns into a counterproductive service, making the data useless because of poor relevance or inappropriate levels of detail. Semantic knowledge is the essential missing piece that allows the delivery of information that matches user requirements. Semantic agreement, in particular, is essential to meaningful data exchange.

Semantic issues have long been open issues in data and knowledge management. However, the boom in semantically poor technologies, such as the Web and XML, has prompted a renewed interest in semantics. Conferences on the Semantic Web, for instance, attract crowds of participants, while ontologies on its own has become a hot and popular topic in the database and artificial intelligence communities.

Springer's LNCS Journal on Data Semantics aims at providing a highly visible dissemination channel for the most remarkable work that in one way or another addresses research and development on issues related to the semantics of data. The target domain ranges from theories supporting the formal definition of semantic content to innovative domain-specific applications of semantic knowledge. This publication channel should be of highest interest to researchers and advanced practitioners working on the Semantic Web, interoperability, mobile information services, data warehousing, knowledge representation and reasoning, conceptual database modeling, ontologies, and artificial intelligence.

Topics of relevance to this journal include:

- semantic interoperability, semantic mediators
- ontologies
- ontology, schema and data integration, reconciliation and alignment
- multiple representations, alternative representations
- knowledge representation and reasoning
- conceptualization and representation
- multimodel and multiparadigm approaches
- mappings, transformations, reverse engineering
- metadata
- conceptual data modeling
- integrity description and handling
- evolution and change
- Web semantics and semistructured data
- semantic caching

- data warehousing and semantic data mining
- spatial, temporal, multimedia and multimodal semantics
- semantics in data visualization
- semantic services for mobile users
- supporting tools
- applications of semantic-driven approaches

These topics are to be understood as specifically related to semantic issues. Contributions submitted to the journal and dealing with semantics of data will be considered even if they are not within the topics in the list.

While the physical appearance of the journal issues looks like the books from the well-known Springer LNCS series, the mode of operation is that of a journal. Contributions can be freely submitted by authors and are reviewed by the Editorial Board. Contributions may also be invited, and nevertheless carefully reviewed, as in the case of issues that contain extended versions of best papers from major conferences addressing data semantics issues. Special issues, focusing on a specific topic, are coordinated by guest editors once the proposal for a special issue is accepted by the Editorial Board. Finally, it is also possible that a journal issue be devoted to a single text.

The journal published its first volume in 2003. This is the second volume, and it will be followed by three volumes to appear in 2005.

The Editorial Board comprises one Editor-in-Chief (with overall responsibility) and several members. The editor-in-chief has a four-year mandate to run the journal. Members of the board have three-year mandates. Mandates are renewable. More members may be added to the Editorial Board as appropriate

We are happy to welcome you into our readership and authorship, and hope we will share this privileged contact for a long time.

Stefano Spaccapietra  
Editor-in-Chief

## JoDS Volume 2 – Guest Editorial

Conferences provide researchers with the fastest way to disseminate their ideas and results to a selected community of other researchers in the same domain. Conferences, however, must enforce limitations in the sizes of the written contributions as well as in the time allocated for the on-site presentations of the contributions. They also have limited audiences, although some publishers such as Springer have a dissemination scheme that brings conference proceedings to much wider audiences than just the actual participants at the conferences.

Publication of an extended version of a conference paper is a much appreciated opportunity for researchers to widely disseminate a significantly improved presentation of their work, where they can develop the appropriate motivations, reasoning, results and comparative analysis. To foster dissemination of the best ideas and results, the Journal on Data Semantics (JoDS) pursues a policy that includes annually publishing extended versions of the best papers from selected conferences whose scope encompasses or intersects the scope of the journal.

The selection for this issue comprises the International Conference on Ontologies, Databases and Applications of Semantics (ODBASE), the International Conference on Cooperative Information Systems (COOPIS), and the IFIP TC11 WG11.5 Working Conference on Integrity and Internal Control in Information Systems (IICIS). Papers from these conferences were selected based on their quality, relevance, and significance, and the viability of extending their results. All extended papers were subject to a stringent review process and the authors were required to respond to all concerns expressed by the reviewers before papers were accepted.

Four papers, showing consistently high reviews from the program committee, were selected among those presented at the *Ontologies, Databases and Applications of Semantics (ODBase)* conference, held in Catania, Italy, November 4–6, 2003. Three of the papers have to do with the construction and maintenance of ontologies and structured taxonomies. *Incrementally Maintaining Materializations of Ontologies Stored in Logic Databases* (by Raphael Volz, Steffen Staab, and Boris Motik) presents a method for propagating changes made to an ontology; the technique is broadly applicable, as it is compatible with any ontology language that can be translated into Datalog programs. *Ontology Translation on the Semantic Web* (by Dejing Dou, Drew McDermott, and Peishen Qi) addresses the highly important problem of resolving terminology differences between related ontologies; the technique manages syntactic as well as semantic translations. *Compound Term Composition Algebra: the Semantics* (by Yannis Tzitzikas, Anastasia Analyti, and Nicolas Spyratos) presents an elegant, formal algebra for specifying the valid compound terms in a taxonomy.

The fourth paper, *Dynamic Pattern Mining: an Incremental Data Clustering Approach* (by Seokkyung Chung and Dennis McLeod) addresses one of the central problems facing users of data mines – the incremental maintenance of a data mine that is constantly updated. The paper deals specifically with services that provide

integrated access to news articles; the method described in the paper is simple yet semantically powerful and quite efficient.

The volume continues with two papers that are comprehensive descriptions of the topics of the two top-rated papers that appeared in the *CoopIS* portion of the proceedings of the conference triad *On the Move to Meaningful Internet Systems*, November 2003. The first paper, *A Knowledge Network Approach for Implementing Active Virtual Marketplaces*, by Minsoo Lee, Stanley Su, and Herman Lam, presents a network approach for implementing virtual marketplaces: bringing buyers and sellers cooperatively together. The paper focuses on an infrastructure that enables sharing of knowledge over the Web and thus effectively supports the formation of virtual marketplaces on the Web. The concept of an active virtual marketplace is realized using this infrastructure by allowing buyers and sellers to specify their knowledge in the form of events, triggers, and rules. The knowledge network can actively distribute and process these knowledge elements to help buyers and sellers to locate and interact with each other.

The second paper, *Stream Integration Techniques for Grid Monitoring*, by Andy Cooke, Alasdair Gray, and Werner Nutt, focuses on a technique for providing information about the status of a cooperative computation grid by utilizing database integration techniques. This novel approach provides an infrastructure for publishing and querying grid monitoring data. Emphasis is placed on the use of the technique for distributed sets of data streams, which provide information about the changes over time of a data source. The concepts and mechanisms devised can also be applied more generally where there is a need for publishing and querying information in a distributed manner.

Finally, the volume contains two papers originally presented at the *6th IFIP TC 11 WG 11.5 Working Conference on Integrity and Internal Control in Information Systems*, which was held November 13–14, 2003 in Lausanne, Switzerland. Traditionally, access controls have been used to limit the availability of data to users; however, they do not protect unauthorized disclosure of sensitive information from careless or malicious insiders with authorized access to the system. The first paper *Information Release Control: a Learning-Based Architecture*, by Claudio Bettini, X. Sean Wang, and Sushil Jajodia, explores the information release control paradigm, which is based on checking data when they are being released across organizational boundaries. Rather than relying simply on source/destination addresses, as in current firewall systems, or on simple “dirty word” matching as in current filtering software, the checking process analyzes the semantics of the released data. This paper formalizes this process and presents the architecture of a system that incorporates a module for learning release constraints.

Nowadays, surveillance devices such as video cameras and microphones have become commonplace in our society. The second paper, *Enforcing Semantics-Aware Security in Multimedia Surveillance*, by Naren Kodali, Csilla Farkas, and Duminda Wijesekera, considers the surveillance data flowing at secured facilities such as airports, nuclear power plants, and national laboratories. Typically, different parts of such facilities have different degrees of sensitivity. Likewise, human guards are categorized according to their rights of access to various locations within the

facilities. The main security requirement is that the guards can view data gathered from locations whose sensitivity is consistent with their access rights. This paper shows how to model the surveillance requirements using the synchronized multimedia integration language (SMIL) with appropriate multilevel security enhancements.

Guest Editors

ODBASE	Roger (Buzz) King, University of Colorado at Boulder, USA Maria Orlowska, University of Queensland, Australia
COOPIS	Elisa Bertino, Purdue University, USA Dennis McLeod, University of Southern California, Los Angeles, USA
IICIS	Sushil Jajodia, George Mason University, USA Leon Strous, De Nederlandsche Bank, The Netherlands

We are pleased to express our gratitude to the reviewers, who invested much of their time in careful analysis and evaluation of the submissions:

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<sup>1</sup> The late Yahiko Kambayashi (Kyoto University, Japan) was a member of the JoDS Editorial Board.

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