

Nicolas Guelfi  
Egidio Astesiano  
Gianna Reggio (Eds.)

LNCS 2952

# Scientific Engineering of Distributed Java Applications

Third International Workshop, FIDJI 2003  
Luxembourg-Kirchberg, Luxembourg, November 2003  
Revised Papers



Tp311.5-53  
F451  
2003

Nicolas Guelfi Egidio Astesiano  
Gianna Reggio (Eds.)

# Scientific Engineering of Distributed Java Applications

Third International Workshop, FIDJI 2003  
Luxembourg-Kirchberg, Luxembourg, November 27-28, 2003  
Revised Papers



E200401597



Springer

## Series Editors

Gerhard Goos, Karlsruhe University, Germany  
Juris Hartmanis, Cornell University, NY, USA  
Jan van Leeuwen, Utrecht University, The Netherlands

## Volume Editors

Nicolas Guelfi  
University of Luxembourg  
Faculty of Science, Technology and Communication  
6, rue Richard Coudenhove-Kalergi, 1359 Luxembourg, Luxembourg  
E-mail: nicolas.guelfi@ist.lu

Egidio Astesiano  
Gianna Reggio  
Università di Genova, DISI  
Via Dodecaneso 35, 16146 Genova, Italy  
E-mail: {astes,reggio}@disi.unige.it

## Cataloging-in-Publication Data applied for

A catalog record for this book is available from the Library of Congress.

Bibliographic information published by Die Deutsche Bibliothek  
Die Deutsche Bibliothek lists this publication in the Deutsche Nationalbibliografie;  
detailed bibliographic data is available in the Internet at <<http://dnb.ddb.de>>.

CR Subject Classification (1998): D.2, H.4, H.3, H.5.3-4, C.2.4, D.1.3

ISSN 0302-9743

ISBN 3-540-21091-1 Springer-Verlag Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer-Verlag. Violations are liable for prosecution under the German Copyright Law.

Springer-Verlag is a part of Springer Science+Business Media  
[springeronline.com](http://springeronline.com)

© Springer-Verlag Berlin Heidelberg 2004  
Printed in Germany

Typesetting: Camera-ready by author, data conversion by PTP-Berlin, Protago-TeX-Production GmbH  
Printed on acid-free paper      SPIN: 10983829      06/3142      5 4 3 2 1 0

# Preface

FIDJI 2003 was an international forum for researchers and practitioners interested in the advances in, and applications of, software engineering for distributed application development. Concerning the technologies, the workshop focused on “Java-related” technologies. It was an opportunity to present and observe the latest research, results, and ideas in these areas.

All papers submitted to this workshop were reviewed by at least two members of the International Program Committee. Acceptance was based primarily on originality and contribution. We selected, for these post-workshop proceedings, 14 papers, amongst 29 submitted, two tutorials, and one keynote talk.

FIDJI 2003 aimed at promoting a scientific approach to software engineering. The scope of the workshop included the following topics:

- design of distributed Java applications
- Java-related technologies
- software and system architecture engineering and development methodologies
- development methodologies for UML
- development methodologies for reliable distributed systems
- component-based development methodologies
- management of evolutions/iterations in the analysis, design, implementation, and test phases
- dependability support during system life-cycles
- managing inconsistencies during application development
- atomicity and exception handling in system development
- software architectures, frameworks, and design patterns for developing distributed systems
- integration of formal techniques in the development process
- formal analysis and grounding of modeling notation and techniques (e.g., UML, metamodeling)
- supporting the security requirements of distributed applications in the development process
- refactoring methods
- industrial and academic case studies
- development and analysis tools

The organization of such a workshop represents an important amount of work. We would like to acknowledge all the program committee members, all the additional referees, all the organization committee members, the University of Luxembourg, the Faculty of Science, Technology and Communication administrative, scientific, and technical staff, and the Henri-Tudor public research center.

FIDJI 2003 was mainly supported by the “Ministère de la Culture, de l’Enseignement supérieur et de la Recherche” and by the “Fond National pour la Recherche au Luxembourg.”

November 2003

Nicolas Guelfi, Egidio Astesiano, Gianna Reggio

# Organization

FIDJI 2003 was organized by the University of Luxembourg, Faculty of Science, Technology and Communication.

## Program Chairs

|                   |                                      |
|-------------------|--------------------------------------|
| Guelfi, Nicolas   | University of Luxembourg, Luxembourg |
| Astesiano, Egidio | DISI Genoa, Italy                    |
| Reggio, Gianna    | DISI Genoa, Italy                    |

## International Program Committee

|                              |                                                   |
|------------------------------|---------------------------------------------------|
| Astesiano, Egidio            | DISI Genoa, Italy                                 |
| Biberstein, Olivier          | HTA, Bienne, Switzerland                          |
| Bouvry, Pascal               | University of Luxembourg, Luxembourg              |
| Di Marzo Serugendo, Giovanna | CUI, Geneva, Switzerland                          |
| Dubois, Eric                 | CRP Henri-Tudor, Luxembourg                       |
| Fourdrinier, Frédéric        | Hewlett-Packard, France                           |
| Guelfi, Nicolas              | University of Luxembourg, Luxembourg              |
| Guerraoui, Rachid            | EPFL, Lausanne, Switzerland                       |
| Huzar, Zbigniew              | Wroclaw University of Technology, Wroclaw, Poland |
| Keller, Rudolph              | Zühlke Engineering, Schlieren, Switzerland        |
| Karsenty, Alain              | JSI, Marseille, France                            |
| Koskimies, Kai               | University of Helsinki, Finland                   |
| Kozaczynski, Wojtek          | Microsoft Corporation, USA                        |
| Molli, Pascal                | LORIA, Nancy, France                              |
| Parnas, David                | University of Limerick, Ireland                   |
| Petitpierre, Claude          | EPFL, Lausanne, Switzerland                       |
| Reggio, Gianna               | DISI, Genova, Italy                               |
| Romanovsky, Sacha            | DCS, Newcastle, UK                                |
| Rothkugel, Steffen           | University of Luxembourg, Luxembourg              |
| Rottier, Geert               | Hewlett-Packard, Belgium                          |
| Sendall, Shane               | EPFL, Lausanne, Switzerland                       |
| Souquières, Jeanine          | LORIA, Nancy, France                              |
| Vachon, Julie                | DIRO, Montreal, Canada                            |
| Warmer, Jos                  | De Nederlandsche Bank, Netherlands                |

## Organizing Committee

Amza, Catalin  
Chabert, Sylvain  
Guelfi, Nicolas  
Kies, Mireille  
Perrouin, Gilles  
Pruski, Cédric  
Ries, Benoît  
Sterges, Paul

University of Luxembourg, Luxembourg  
University of Luxembourg, Luxembourg  
University of Luxembourg, Luxembourg  
University of Luxembourg, Luxembourg  
University of Luxembourg, Luxembourg  
University of Luxembourg, Luxembourg  
University of Luxembourg, Luxembourg  
University of Luxembourg, Luxembourg

## Additional Referees

Chabert, Sylvain  
Damien, Nicolas  
Foukia, Noria  
Kechicheb, Belkacem  
Oriol, Manuel  
Pawlak, Michel  
Perrouin, Gilles  
Pruski, Cédric

Ramel, Sophie  
Razafimahefa, Chrislain  
Razavi, Reza  
Renault, Simon  
Ries, Benoît  
Sterges, Paul

## Sponsoring Institutions

Université du  
LUXEMBOURG



fonds national de la  
recherche

This workshop was supported by the University of Luxembourg, the Ministry for Culture, Higher Education and Research, and the National Research Fund.

Lecture Notes in Computer Science  
Edited by G. Goos, J. Hartmanis, and J. van Leeuwen

2952

**Springer**

*Berlin*

*Heidelberg*

*New York*

*Hong Kong*

*London*

*Milan*

*Paris*

*Tokyo*

# Lecture Notes in Computer Science

For information about Vols. 1–2837

please contact your bookseller or Springer-Verlag

- Vol. 2964: T. Okamoto (Ed.), Topics in Cryptology – CT-RSA 2004. XI, 387 pages. 2004.
- Vol. 2961: P. Eklund (Ed.), Formal Concept Analysis. IX, 411 pages. 2004.
- Vol. 2957: P. Langendoerfer, M. Liu, I. Matta, V. Tsoulos (Eds.), Wired/Wireless Internet Communications. XI, 307 pages. 2004.
- Vol. 2954: F. Crestani, M. Dunlop, S. Mizzaro (Eds.), Mobile and Ubiquitous Information Access. X, 299 pages. 2004.
- Vol. 2953: K. Konrad, Model Generation for Natural Language Interpretation and Analysis. XIII, 166 pages. 2004. (Subseries LNAI).
- Vol. 2952: N. Guelfi, E. Astesiano, G. Reggio (Eds.), Scientific Engineering of Distributed Java Applications. Proceedings, 2003. X, 157 pages. 2004.
- Vol. 2951: M. Naor (Ed.), Theory of Cryptography. XI, 523 pages. 2004.
- Vol. 2949: R. De Nicola, G. Ferrari, G. Meredith (Eds.), Coordination Models and Languages. X, 323 pages. 2004.
- Vol. 2947: F. Bao, R. Deng, J. Zhou (Eds.), Public Key Cryptography – PKC 2004. XI, 455 pages. 2004.
- Vol. 2946: R. Focardi, R. Gorrieri (Eds.), Foundations of Security Analysis and Design II. VII, 267 pages. 2004.
- Vol. 2943: J. Chen, J. Reif (Eds.), DNA Computing. X, 225 pages. 2004.
- Vol. 2934: G. Lindemann, D. Moldt, M. Paolucci (Eds.), Regulated Agent-Based Social Systems. X, 301 pages. 2004. (Subseries LNAI).
- Vol. 2930: F. Winkler, Automated Deduction in Geometry. VII, 231 pages. 2004. (Subseries LNAI).
- Vol. 2923: V. Lifschitz, I. Niemelä (Eds.), Logic Programming and Nonmonotonic Reasoning. IX, 365 pages. 2004. (Subseries LNAI).
- Vol. 2917: E. Quintarelli, Model-Checking Based Data Retrieval. XVI, 134 pages. 2004.
- Vol. 2916: C. Palamidessi (Ed.), Logic Programming. XII, 520 pages. 2003.
- Vol. 2915: A. Camurri, G. Volpe (Eds.), Gesture and Sign Languages in Human-Computer Interaction. XI, 558 pages. 2004. (Subseries LNAI).
- Vol. 2914: P.K. Pandya, J. Radhakrishnan (Eds.), FST TCS 2003: Foundations of Software Technology and Theoretical Computer Science. XIII, 446 pages. 2003.
- Vol. 2913: T.M. Pinkston, V.K. Prasanna (Eds.), High Performance Computing – HiPC 2003. XX, 512 pages. 2003. (Subseries LNAI).
- Vol. 2911: T.M.T. Sembok, H.B. Zaman, H. Chen, S.R. Urs, S.H. Myaeng (Eds.), Digital Libraries: Technology and Management of Indigenous Knowledge for Global Access. XX, 703 pages. 2003.
- Vol. 2910: M.E. Orlowska, S. Weerawarana, M.M.P. Papazoglou, J. Yang (Eds.), Service-Oriented Computing – ICSSOC 2003. XIV, 576 pages. 2003.
- Vol. 2909: R. Solis-Oba, K. Jansen (Eds.), Approximation and Online Algorithms. VIII, 269 pages. 2004.
- Vol. 2909: R. Solis-Oba, K. Jansen (Eds.), Approximation and Online Algorithms. VIII, 269 pages. 2004.
- Vol. 2908: K. Chae, M. Yung (Eds.), Information Security Applications. XII, 506 pages. 2004.
- Vol. 2907: I. Lirkov, S. Margenov, J. Wasniewski, P. Yalamov, Large-Scale Scientific Computing. XI, 490 pages. 2004.
- Vol. 2906: T. Ibaraki, N. Katoh, H. Ono (Eds.), Algorithms and Computation. XVII, 748 pages. 2003.
- Vol. 2905: A. Sanfeliu, J. Ruiz-Shulcloper (Eds.), Progress in Pattern Recognition, Speech and Image Analysis. XVII, 693 pages. 2003.
- Vol. 2904: T. Johansson, S. Maitra (Eds.), Progress in Cryptology – INDOCRYPT 2003. XI, 431 pages. 2003.
- Vol. 2903: T.D. Gedeon, L.C.C. Fung (Eds.), AI 2003: Advances in Artificial Intelligence. XVI, 1075 pages. 2003. (Subseries LNAI).
- Vol. 2902: F.M. Pires, S.P. Abreu (Eds.), Progress in Artificial Intelligence. XV, 504 pages. 2003. (Subseries LNAI).
- Vol. 2901: F. Bry, N. Henze, J. Małuszynski (Eds.), Principles and Practice of Semantic Web Reasoning. X, 209 pages. 2003.
- Vol. 2900: M. Bidoit, P.D. Mosses (Eds.), Casl User Manual. XIII, 240 pages. 2004.
- Vol. 2899: G. Ventre, R. Canonico (Eds.), Interactive Multimedia on Next Generation Networks. XIV, 420 pages. 2003.
- Vol. 2898: K.G. Paterson (Ed.), Cryptography and Coding. IX, 385 pages. 2003.
- Vol. 2897: O. Balet, G. Subsol, P. Torguet (Eds.), Virtual Storytelling. XI, 240 pages. 2003.
- Vol. 2896: V.A. Saraswat (Ed.), Advances in Computing Science – ASIAN 2003. VIII, 305 pages. 2003.
- Vol. 2895: A. Ohori (Ed.), Programming Languages and Systems. XIII, 427 pages. 2003.
- Vol. 2894: C.S. Lai (Ed.), Advances in Cryptology – ASIACRYPT 2003. XIII, 543 pages. 2003.
- Vol. 2893: J.-B. Stefani, I. Demeure, D. Hagimont (Eds.), Distributed Applications and Interoperable Systems. XIII, 311 pages. 2003.

- Vol. 2892: F. Dau, The Logic System of Concept Graphs with Negation. XI, 213 pages. 2003. (Subseries LNAI).
- Vol. 2891: J. Lee, M. Barley (Eds.), Intelligent Agents and Multi-Agent Systems. X, 215 pages. 2003. (Subseries LNAI).
- Vol. 2890: M. Broy, A.V. Zamulin (Eds.), Perspectives of System Informatics. XV, 572 pages. 2003.
- Vol. 2889: R. Meersman, Z. Tari (Eds.), On The Move to Meaningful Internet Systems 2003: OTM 2003 Workshops. XIX, 1071 pages. 2003.
- Vol. 2888: R. Meersman, Z. Tari, D.C. Schmidt (Eds.), On The Move to Meaningful Internet Systems 2003: CoopIS, DOA, and ODBASE. XXI, 1546 pages. 2003.
- Vol. 2887: T. Johansson (Ed.), Fast Software Encryption. IX, 397 pages. 2003.
- Vol. 2886: I. Nyström, G. Sanniti di Baja, S. Svensson (Eds.), Discrete Geometry for Computer Imagery. XII, 556 pages. 2003.
- Vol. 2885: J.S. Dong, J. Woodcock (Eds.), Formal Methods and Software Engineering. XI, 683 pages. 2003.
- Vol. 2884: E. Najm, U. Nestmann, P. Stevens (Eds.), Formal Methods for Open Object-Based Distributed Systems. X, 293 pages. 2003.
- Vol. 2883: J. Schaeffer, M. Müller, Y. Björnsson (Eds.), Computers and Games. XI, 431 pages. 2003.
- Vol. 2882: D. Veit, Matchmaking in Electronic Markets. XV, 180 pages. 2003. (Subseries LNAI).
- Vol. 2881: E. Horlait, T. Magedanz, R.H. Glitho (Eds.), Mobile Agents for Telecommunication Applications. IX, 297 pages. 2003.
- Vol. 2880: H.L. Bodlaender (Ed.), Graph-Theoretic Concepts in Computer Science. XI, 386 pages. 2003.
- Vol. 2879: R.E. Ellis, T.M. Peters (Eds.), Medical Image Computing and Computer-Assisted Intervention - MIC-CAI 2003. XXXIV, 1003 pages. 2003.
- Vol. 2878: R.E. Ellis, T.M. Peters (Eds.), Medical Image Computing and Computer-Assisted Intervention - MIC-CAI 2003. XXXIII, 819 pages. 2003.
- Vol. 2877: T. Böhme, G. Heyer, H. Unger (Eds.), Innovative Internet Community Systems. VIII, 263 pages. 2003.
- Vol. 2876: M. Schroeder, G. Wagner (Eds.), Rules and Rule Markup Languages for the Semantic Web. VII, 173 pages. 2003.
- Vol. 2875: E. Aarts, R. Collier, E.v. Loenen, B.d. Ruyter (Eds.), Ambient Intelligence. XI, 432 pages. 2003.
- Vol. 2874: C. Priami (Ed.), Global Computing. XIX, 255 pages. 2003.
- Vol. 2871: N. Zhong, Z.W. Raś, S. Tsumoto, E. Suzuki (Eds.), Foundations of Intelligent Systems. XV, 697 pages. 2003. (Subseries LNAI).
- Vol. 2870: D. Fensel, K.P. Sycara, J. Mylopoulos (Eds.), The Semantic Web - ISWC 2003. XV, 931 pages. 2003.
- Vol. 2869: A. Yazici, C. Şener (Eds.), Computer and Information Sciences - ISCIS 2003. XIX, 1110 pages. 2003.
- Vol. 2868: P. Perner, R. Brause, H.-G. Holzhütter (Eds.), Medical Data Analysis. VIII, 127 pages. 2003.
- Vol. 2866: J. Akiyama, M. Kano (Eds.), Discrete and Computational Geometry. VIII, 285 pages. 2003.
- Vol. 2865: S. Pierre, M. Barbeau, E. Kranakis (Eds.), Ad-Hoc, Mobile, and Wireless Networks. X, 293 pages. 2003.
- Vol. 2864: A.K. Dey, A. Schmidt, J.F. McCarthy (Eds.), UbiComp 2003: Ubiquitous Computing. XVII, 368 pages. 2003.
- Vol. 2863: P. Stevens, J. Whittle, G. Booch (Eds.), "UML" 2003 - The Unified Modeling Language. XIV, 415 pages. 2003.
- Vol. 2860: D. Geist, E. Tronci (Eds.), Correct Hardware Design and Verification Methods. XII, 426 pages. 2003.
- Vol. 2859: B. Apolloni, M. Marinaro, R. Tagliaferri (Eds.), Neural Nets. X, 376 pages. 2003.
- Vol. 2857: M.A. Nascimento, E.S. de Moura, A.L. Oliveira (Eds.), String Processing and Information Retrieval. XI, 379 pages. 2003.
- Vol. 2856: M. Smirnov (Ed.), Quality of Future Internet Services. IX, 293 pages. 2003.
- Vol. 2855: R. Alur, I. Lee (Eds.), Embedded Software. X, 373 pages. 2003.
- Vol. 2854: J. Hoffmann, Utilizing Problem Structure in Planing. XIII, 251 pages. 2003. (Subseries LNAI).
- Vol. 2853: M. Jeckle, L.-J. Zhang (Eds.), Web Services - ICWS-Europe 2003. VIII, 227 pages. 2003.
- Vol. 2852: F.S. de Boer, M.M. Bonsangue, S. Graf, W.-P. de Roever (Eds.), Formal Methods for Components and Objects. VIII, 509 pages. 2003.
- Vol. 2851: C. Boyd, W. Mao (Eds.), Information Security. XI, 453 pages. 2003.
- Vol. 2849: N. García, L. Salgado, J.M. Martínez (Eds.), Visual Content Processing and Representation. XII, 352 pages. 2003.
- Vol. 2848: F.E. Fich (Ed.), Distributed Computing. X, 367 pages. 2003.
- Vol. 2847: R.d. Lemos, T.S. Weber, J.B. Camargo Jr. (Eds.), Dependable Computing. XIV, 371 pages. 2003.
- Vol. 2846: J. Zhou, M. Yung, Y. Han (Eds.), Applied Cryptography and Network Security. XI, 436 pages. 2003.
- Vol. 2845: B. Christianson, B. Crispo, J.A. Malcolm, M. Roe (Eds.), Security Protocols. VIII, 243 pages. 2004.
- Vol. 2844: J.A. Jorge, N. Jardim Nunes, J. Falcão e Cunha (Eds.), Interactive Systems. Design, Specification, and Verification. XIII, 429 pages. 2003.
- Vol. 2843: G. Grieser, Y. Tanaka, A. Yamamoto (Eds.), Discovery Science. XII, 504 pages. 2003. (Subseries LNAI).
- Vol. 2842: R. Gavaldá, K.P. Jantke, E. Takimoto (Eds.), Algorithmic Learning Theory. XI, 313 pages. 2003. (Subseries LNAI).
- Vol. 2841: C. Blundo, C. Laneve (Eds.), Theoretical Computer Science. XI, 397 pages. 2003.
- Vol. 2840: J. Dongarra, D. Laforenza, S. Orlando (Eds.), Recent Advances in Parallel Virtual Machine and Message Passing Interface. XVIII, 693 pages. 2003.
- Vol. 2839: A. Marshall, N. Agoulmine (Eds.), Management of Multimedia Networks and Services. XIV, 532 pages. 2003.
- Vol. 2838: N. Lavrač, D. Gamberger, L. Todorovski, H. Blockeel (Eds.), Knowledge Discovery in Databases: PKDD 2003. XVI, 508 pages. 2003. (Subseries LNAI).



**Springer**

*Berlin*

*Heidelberg*

*New York*

*Hong Kong*

*London*

*Milan*

*Paris*

*Tokyo*

# Lecture Notes in Computer Science

For information about Vols. 1–2837

please contact your bookseller or Springer-Verlag

- Vol. 2964: T. Okamoto (Ed.), Topics in Cryptology – CT-RSA 2004. XI, 387 pages. 2004.
- Vol. 2961: P. Eklund (Ed.), Formal Concept Analysis. IX, 411 pages. 2004.
- Vol. 2957: P. Langendoerfer, M. Liu, I. Matta, V. Tsoulos (Eds.), Wired/Wireless Internet Communications. XI, 307 pages. 2004.
- Vol. 2954: F. Crestani, M. Dunlop, S. Mizzaro (Eds.), Mobile and Ubiquitous Information Access. X, 299 pages. 2004.
- Vol. 2953: K. Konrad, Model Generation for Natural Language Interpretation and Analysis. XIII, 166 pages. 2004. (Subseries LNAI).
- Vol. 2952: N. Guelfi, E. Astesiano, G. Reggio (Eds.), Scientific Engineering of Distributed Java Applications. Proceedings, 2003. X, 157 pages. 2004.
- Vol. 2951: M. Naor (Ed.), Theory of Cryptography. XI, 523 pages. 2004.
- Vol. 2949: R. De Nicola, G. Ferrari, G. Meredith (Eds.), Coordination Models and Languages. X, 323 pages. 2004.
- Vol. 2947: F. Bao, R. Deng, J. Zhou (Eds.), Public Key Cryptography – PKC 2004. XI, 455 pages. 2004.
- Vol. 2946: R. Focardi, R. Gorrieri (Eds.), Foundations of Security Analysis and Design II. VII, 267 pages. 2004.
- Vol. 2943: J. Chen, J. Reif (Eds.), DNA Computing. X, 225 pages. 2004.
- Vol. 2934: G. Lindemann, D. Moldt, M. Paolucci (Eds.), Regulated Agent-Based Social Systems. X, 301 pages. 2004. (Subseries LNAI).
- Vol. 2930: F. Winkler, Automated Deduction in Geometry. VII, 231 pages. 2004. (Subseries LNAI).
- Vol. 2923: V. Lifschitz, I. Niemelä (Eds.), Logic Programming and Nonmonotonic Reasoning. IX, 365 pages. 2004. (Subseries LNAI).
- Vol. 2917: E. Quintarelli, Model-Checking Based Data Retrieval. XVI, 134 pages. 2004.
- Vol. 2916: C. Palamidessi (Ed.), Logic Programming. XII, 520 pages. 2003.
- Vol. 2915: A. Camurri, G. Volpe (Eds.), Gesture and Sign Languages in Human-Computer Interaction. XI, 558 pages. 2004. (Subseries LNAI).
- Vol. 2914: P.K. Pandya, J. Radhakrishnan (Eds.), FST TCS 2003: Foundations of Software Technology and Theoretical Computer Science. XIII, 446 pages. 2003.
- Vol. 2913: T.M. Pinkston, V.K. Prasanna (Eds.), High Performance Computing – HiPC 2003. XX, 512 pages. 2003. (Subseries LNAI).
- Vol. 2911: T.M.T. Sembok, H.B. Zaman, H. Chen, S.R. Urs, S.H. Myaeng (Eds.), Digital Libraries: Technology and Management of Indigenous Knowledge for Global Access. XX, 703 pages. 2003.
- Vol. 2910: M.E. Orlowska, S. Weerawarana, M.M.P. Papazoglou, J. Yang (Eds.), Service-Oriented Computing – ICSSOC 2003. XIV, 576 pages. 2003.
- Vol. 2909: R. Solis-Oba, K. Jansen (Eds.), Approximation and Online Algorithms. VIII, 269 pages. 2004.
- Vol. 2909: R. Solis-Oba, K. Jansen (Eds.), Approximation and Online Algorithms. VIII, 269 pages. 2004.
- Vol. 2908: K. Chae, M. Yung (Eds.), Information Security Applications. XII, 506 pages. 2004.
- Vol. 2907: I. Lirkov, S. Margenov, J. Wasniewski, P. Yalamov, Large-Scale Scientific Computing. XI, 490 pages. 2004.
- Vol. 2906: T. Ibaraki, N. Katoh, H. Ono (Eds.), Algorithms and Computation. XVII, 748 pages. 2003.
- Vol. 2905: A. Sanfeliu, J. Ruiz-Shulcloper (Eds.), Progress in Pattern Recognition, Speech and Image Analysis. XVII, 693 pages. 2003.
- Vol. 2904: T. Johansson, S. Maitra (Eds.), Progress in Cryptology – INDOCRYPT 2003. XI, 431 pages. 2003.
- Vol. 2903: T.D. Gedeon, L.C.C. Fung (Eds.), AI 2003: Advances in Artificial Intelligence. XVI, 1075 pages. 2003. (Subseries LNAI).
- Vol. 2902: F.M. Pires, S.P. Abreu (Eds.), Progress in Artificial Intelligence. XV, 504 pages. 2003. (Subseries LNAI).
- Vol. 2901: F. Bry, N. Henze, J. Małuszynski (Eds.), Principles and Practice of Semantic Web Reasoning. X, 209 pages. 2003.
- Vol. 2900: M. Bidoit, P.D. Mosses (Eds.), Casl User Manual. XIII, 240 pages. 2004.
- Vol. 2899: G. Ventre, R. Canonico (Eds.), Interactive Multimedia on Next Generation Networks. XIV, 420 pages. 2003.
- Vol. 2898: K.G. Paterson (Ed.), Cryptography and Coding. IX, 385 pages. 2003.
- Vol. 2897: O. Balet, G. Subsol, P. Torguet (Eds.), Virtual Storytelling. XI, 240 pages. 2003.
- Vol. 2896: V.A. Saraswat (Ed.), Advances in Computing Science – ASIAN 2003. VIII, 305 pages. 2003.
- Vol. 2895: A. Ohori (Ed.), Programming Languages and Systems. XIII, 427 pages. 2003.
- Vol. 2894: C.S. Lai (Ed.), Advances in Cryptology – ASIACRYPT 2003. XIII, 543 pages. 2003.
- Vol. 2893: J.-B. Stefani, I. Demeure, D. Hagimont (Eds.), Distributed Applications and Interoperable Systems. XIII, 311 pages. 2003.

- Vol. 2892: F. Dau, The Logic System of Concept Graphs with Negation. XI, 213 pages. 2003. (Subseries LNAI).
- Vol. 2891: J. Lee, M. Barley (Eds.), Intelligent Agents and Multi-Agent Systems. X, 215 pages. 2003. (Subseries LNAI).
- Vol. 2890: M. Broy, A.V. Zamulin (Eds.), Perspectives of System Informatics. XV, 572 pages. 2003.
- Vol. 2889: R. Meersman, Z. Tari (Eds.), On The Move to Meaningful Internet Systems 2003: OTM 2003 Workshops. XIX, 1071 pages. 2003.
- Vol. 2888: R. Meersman, Z. Tari, D.C. Schmidt (Eds.), On The Move to Meaningful Internet Systems 2003: CoopIS, DOA, and ODBASE. XXI, 1546 pages. 2003.
- Vol. 2887: T. Johansson (Ed.), Fast Software Encryption. IX, 397 pages. 2003.
- Vol. 2886: I. Nyström, G. Sanniti di Baja, S. Svensson (Eds.), Discrete Geometry for Computer Imagery. XII, 556 pages. 2003.
- Vol. 2885: J.S. Dong, J. Woodcock (Eds.), Formal Methods and Software Engineering. XI, 683 pages. 2003.
- Vol. 2884: E. Najm, U. Nestmann, P. Stevens (Eds.), Formal Methods for Open Object-Based Distributed Systems. X, 293 pages. 2003.
- Vol. 2883: J. Schaeffer, M. Müller, Y. Björnsson (Eds.), Computers and Games. XI, 431 pages. 2003.
- Vol. 2882: D. Veit, Matchmaking in Electronic Markets. XV, 180 pages. 2003. (Subseries LNAI).
- Vol. 2881: E. Horlait, T. Magedanz, R.H. Glitho (Eds.), Mobile Agents for Telecommunication Applications. IX, 297 pages. 2003.
- Vol. 2880: H.L. Bodlaender (Ed.), Graph-Theoretic Concepts in Computer Science. XI, 386 pages. 2003.
- Vol. 2879: R.E. Ellis, T.M. Peters (Eds.), Medical Image Computing and Computer-Assisted Intervention - MICCAI 2003. XXXIV, 1003 pages. 2003.
- Vol. 2878: R.E. Ellis, T.M. Peters (Eds.), Medical Image Computing and Computer-Assisted Intervention - MICCAI 2003. XXXIII, 819 pages. 2003.
- Vol. 2877: T. Böhme, G. Heyer, H. Unger (Eds.), Innovative Internet Community Systems. VIII, 263 pages. 2003.
- Vol. 2876: M. Schroeder, G. Wagner (Eds.), Rules and Rule Markup Languages for the Semantic Web. VII, 173 pages. 2003.
- Vol. 2875: E. Aarts, R. Collier, E.v. Loenen, B.d. Ruyter (Eds.), Ambient Intelligence. XI, 432 pages. 2003.
- Vol. 2874: C. Priami (Ed.), Global Computing. XIX, 255 pages. 2003.
- Vol. 2871: N. Zhong, Z.W. Raś, S. Tsumoto, E. Suzuki (Eds.), Foundations of Intelligent Systems. XV, 697 pages. 2003. (Subseries LNAI).
- Vol. 2870: D. Fensel, K.P. Sycara, J. Mylopoulos (Eds.), The Semantic Web - ISWC 2003. XV, 931 pages. 2003.
- Vol. 2869: A. Yazici, C. Şener (Eds.), Computer and Information Sciences - ISCIS 2003. XIX, 1110 pages. 2003.
- Vol. 2868: P. Perner, R. Brause, H.-G. Holzhütter (Eds.), Medical Data Analysis. VIII, 127 pages. 2003.
- Vol. 2866: J. Akiyama, M. Kano (Eds.), Discrete and Computational Geometry. VIII, 285 pages. 2003.
- Vol. 2865: S. Pierre, M. Barbeau, E. Kranakis (Eds.), Ad-Hoc, Mobile, and Wireless Networks. X, 293 pages. 2003.
- Vol. 2864: A.K. Dey, A. Schmidt, J.F. McCarthy (Eds.), UbiComp 2003: Ubiquitous Computing. XVII, 368 pages. 2003.
- Vol. 2863: P. Stevens, J. Whittle, G. Booch (Eds.), "UML" 2003 - The Unified Modeling Language. XIV, 415 pages. 2003.
- Vol. 2860: D. Geist, E. Tronci (Eds.), Correct Hardware Design and Verification Methods. XII, 426 pages. 2003.
- Vol. 2859: B. Apolloni, M. Marinaro, R. Tagliaferri (Eds.), Neural Nets. X, 376 pages. 2003.
- Vol. 2857: M.A. Nascimento, E.S. de Moura, A.L. Oliveira (Eds.), String Processing and Information Retrieval. XI, 379 pages. 2003.
- Vol. 2856: M. Smirnov (Ed.), Quality of Future Internet Services. IX, 293 pages. 2003.
- Vol. 2855: R. Alur, I. Lee (Eds.), Embedded Software. X, 373 pages. 2003.
- Vol. 2854: J. Hoffmann, Utilizing Problem Structure in Planing. XIII, 251 pages. 2003. (Subseries LNAI).
- Vol. 2853: M. Jeckle, L.-J. Zhang (Eds.), Web Services - ICWS-Europe 2003. VIII, 227 pages. 2003.
- Vol. 2852: F.S. de Boer, M.M. Bonsangue, S. Graf, W.-P. de Roever (Eds.), Formal Methods for Components and Objects. VIII, 509 pages. 2003.
- Vol. 2851: C. Boyd, W. Mao (Eds.), Information Security. XI, 453 pages. 2003.
- Vol. 2849: N. García, L. Salgado, J.M. Martínez (Eds.), Visual Content Processing and Representation. XII, 352 pages. 2003.
- Vol. 2848: F.E. Fich (Ed.), Distributed Computing. X, 367 pages. 2003.
- Vol. 2847: R.d. Lemos, T.S. Weber, J.B. Camargo Jr. (Eds.), Dependable Computing. XIV, 371 pages. 2003.
- Vol. 2846: J. Zhou, M. Yung, Y. Han (Eds.), Applied Cryptography and Network Security. XI, 436 pages. 2003.
- Vol. 2845: B. Christianson, B. Crispo, J.A. Malcolm, M. Roe (Eds.), Security Protocols. VIII, 243 pages. 2004.
- Vol. 2844: J.A. Jorge, N. Jardim Nunes, J. Falcão e Cunha (Eds.), Interactive Systems. Design, Specification, and Verification. XIII, 429 pages. 2003.
- Vol. 2843: G. Grieser, Y. Tanaka, A. Yamamoto (Eds.), Discovery Science. XII, 504 pages. 2003. (Subseries LNAI).
- Vol. 2842: R. Gavaldá, K.P. Jantke, E. Takimoto (Eds.), Algorithmic Learning Theory. XI, 313 pages. 2003. (Subseries LNAI).
- Vol. 2841: C. Blundo, C. Laneve (Eds.), Theoretical Computer Science. XI, 397 pages. 2003.
- Vol. 2840: J. Dongarra, D. Laforenza, S. Orlando (Eds.), Recent Advances in Parallel Virtual Machine and Message Passing Interface. XVIII, 693 pages. 2003.
- Vol. 2839: A. Marshall, N. Agoulmine (Eds.), Management of Multimedia Networks and Services. XIV, 532 pages. 2003.
- Vol. 2838: N. Lavrač, D. Gamberger, L. Todorovski, H. Blockeel (Eds.), Knowledge Discovery in Databases: PKDD 2003. XVI, 508 pages. 2003. (Subseries LNAI).

# Table of Contents

|                                                                                                      |     |
|------------------------------------------------------------------------------------------------------|-----|
| A Framework for Resolution of Deployment Dependencies in<br>Java-Enabled Service Gateways .....      | 1   |
| <i>Jose L. Ruiz, Jose L. Arciniegas, Rodrigo Cerón, Jesús Bermejo,<br/>Juan C. Dueñas</i>            |     |
| A Java Package for Class and Mixin Mobility in a<br>Distributed Setting .....                        | 12  |
| <i>Lorenzo Bettini</i>                                                                               |     |
| Streaming Services: Specification and Implementation Based on XML<br>and JMF .....                   | 23  |
| <i>Björn Althun, Martin Zimmermann</i>                                                               |     |
| Hard Real-Time Implementation of Embedded Software in JAVA .....                                     | 33  |
| <i>Jean-Pierre Talpin, Abdoulaye Gamatié, David Berner, Bruno Le Dez,<br/>Paul Le Guernic</i>        |     |
| Experiment on Embedding Interception Service into Java RMI .....                                     | 48  |
| <i>Jessica Chen, Kun Wang</i>                                                                        |     |
| BANip: Enabling Remote Healthcare Monitoring with<br>Body Area Networks .....                        | 62  |
| <i>Nikolay Dokovsky, Aart van Halteren, Ing Widya</i>                                                |     |
| Structural Testing of Mobile Agents .....                                                            | 73  |
| <i>Márcio Delamaro, Auri Marcelo Rizzo Vincenzi</i>                                                  |     |
| A Model of Error Management for Financial Systems .....                                              | 86  |
| <i>Hans Ewetz, Niloufar Sharif</i>                                                                   |     |
| Software Model Engineering and Reuse with the Evolution and<br>Validation Environment .....          | 96  |
| <i>Jörn Guy Süß, Andreas Leicher, Fadi Chabarek</i>                                                  |     |
| Distributed Composite Objects: A New Object Model for<br>Cooperative Applications .....              | 106 |
| <i>Guray Yilmaz, Nadia Erdogan</i>                                                                   |     |
| A Java-Based Uniform Workbench for Simulating and<br>Executing Distributed Mobile Applications ..... | 116 |
| <i>Hannes Frey, Daniel Görgen, Johannes K. Lehnert, Peter Sturm</i>                                  |     |
| Seamless UML Support for Service-Based Software<br>Architectures .....                               | 128 |
| <i>Matthias Tichy, Holger Giese</i>                                                                  |     |

Model Generation for Distributed Java Programs ..... 139  
    *Rabéa Boulifa, Eric Madelaine*

**Keynote Talks**

Software Inspections We Can Trust ..... 153  
    *David Parnas*

**Tutorials**

J2EE and .NET: Interoperability with Webservices ..... 155  
    *Alain Leroy*

**Author Index** ..... 157