

Heng Tao Shen Jinbao Li
Minglu Li Jun Ni
Wei Wang (Eds.)

LNC3 3842

Advanced Web and Network Technologies, and Applications

APWeb 2006 International Workshops:
XRA, IWSN, MEGA, and ICSE
Harbin, China, January 2006, Proceedings

Heng Tao Shen Jinbao Li Minglu Li
Jun Ni Wei Wang (Eds.)

Advanced Web and Network Technologies, and Applications

APWeb 2006 International Workshops:
XRA, IWSN, MEGA, and ICSE
Harbin, China, January 16-18, 2006
Proceedings

江苏工业学院图书馆
藏书章

Heng Tao Shen
University of Queensland
School of Information Technology and Electrical Engineering
Brisbane QLD 4072, Australia
E-mail: shenht@itee.uq.edu.au

Jinbao Li
Heilongjiang University
Department of Computer Science and Technology
74 Xue Fu Road, Harbin 150080, China
E-mail: jbli@hlju.edu.cn

Minglu Li
Shanghai Jiao Tong University
Department of Computer Science and Engineering
1954 Hua Shan Road, Shanghai 200030, China
E-mail: li-ml@cs.sjtu.edu.cn

Jun Ni
University of Iowa
Department of Computer Science, College of Liberal Arts and Science
Iowa City, IA 52242, USA
E-mail: jun-ni@uiowa.edu

Wei Wang
University of New South Wales
School of Computer Science and Engineering
NSW 2052, Australia
E-mail: weiw@cse.unsw.edu.au

Library of Congress Control Number: Applied for

CR Subject Classification (1998): H.3, H.4, H.5, C.2, K.4

ISSN	0302-9743
ISBN-10	3-540-31158-0 Springer Berlin Heidelberg New York
ISBN-13	978-3-540-31158-4 Springer 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. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media
springer.com

© Springer-Verlag Berlin Heidelberg 2006
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 11610496 06/3142 5 4 3 2 1 0

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

University of Dortmund, Germany

Madhu Sudan

Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos

New York University, NY, USA

Doug Tygar

University of California, Berkeley, CA, USA

Moshe Y. Vardi

Rice University, Houston, TX, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Lecture Notes in Computer Science

For information about Vols. 1–3754

please contact your bookseller or Springer

- Vol. 3860: D. Pointcheval (Ed.), *Topics in Cryptology – CT-RSA 2006*. XI, 365 pages. 2006.
- Vol. 3855: E. A. Emerson, K.S. Namjoshi (Eds.), *Verification, Model Checking, and Abstract Interpretation*. XI, 443 pages. 2006.
- Vol. 3850: R. Freund, G. Păun, G. Rozenberg, A. Salomaa (Eds.), *Membrane Computing*. IX, 371 pages. 2006.
- Vol. 3842: H.T. Shen, J. Li, M. Li, J. Ni, W. Wang (Eds.), *Advanced Web and Network Technologies, and Applications*. XXVII, 1057 pages. 2006.
- Vol. 3840: M. Li, B. Boehm, L.J. Osterweil (Eds.), *Unifying the Software Process Spectrum*. XVI, 522 pages. 2006.
- Vol. 3838: A. Middeldorp, V. van Oostrom, F. van Raamsdonk, R. de Vrijer (Eds.), *Processes, Terms and Cycles: Steps on the Road to Infinity*. XVIII, 639 pages. 2005.
- Vol. 3837: K. Cho, P. Jacquet (Eds.), *Technologies for Advanced Heterogeneous Networks*. IX, 307 pages. 2005.
- Vol. 3835: G. Sutcliffe, A. Voronkov (Eds.), *Logic for Programming, Artificial Intelligence, and Reasoning*. XIV, 744 pages. 2005. (Sublibrary LNAI).
- Vol. 3834: D. Feitelson, E. Frachtenberg, L. Rudolph, U. Schwiiegelshohn (Eds.), *Job Scheduling Strategies for Parallel Processing*. VIII, 283 pages. 2005.
- Vol. 3833: K.-J. Li, C. Vangenot (Eds.), *Web and Wireless Geographical Information Systems*. XI, 309 pages. 2005.
- Vol. 3832: D. Zhang, A.K. Jain (Eds.), *Advances in Biometrics*. XX, 796 pages. 2005.
- Vol. 3831: J. Wiedermann, G. Tel, J. Pokorný, M. Bieliková, J. Štuller (Eds.), *SOFSEM 2006: Theory and Practice of Computer Science*. XV, 576 pages. 2006.
- Vol. 3829: P. Pettersson, W. Yi (Eds.), *Formal Modeling and Analysis of Timed Systems*. IX, 305 pages. 2005.
- Vol. 3828: X. Deng, Y. Ye (Eds.), *Internet and Network Economics*. XVII, 1106 pages. 2005.
- Vol. 3827: X. Deng, D. Du (Eds.), *Algorithms and Computation*. XX, 1190 pages. 2005.
- Vol. 3826: B. Benatallah, F. Casati, P. Traverso (Eds.), *Service-Oriented Computing – ICSOC 2005*. XVIII, 597 pages. 2005.
- Vol. 3824: L.T. Yang, M. Amamiya, Z. Liu, M. Guo, F.J. Rammig (Eds.), *Embedded and Ubiquitous Computing – EUC 2005*. XXIII, 1204 pages. 2005.
- Vol. 3823: T. Enokido, L. Yan, B. Xiao, D. Kim, Y. Dai, L.T. Yang (Eds.), *Embedded and Ubiquitous Computing – EUC 2005 Workshops*. XXXII, 1317 pages. 2005.
- Vol. 3822: D. Feng, D. Lin, M. Yung (Eds.), *Information Security and Cryptology*. XII, 420 pages. 2005.
- Vol. 3821: R. Ramanujam, S. Sen (Eds.), *FSTTCS 2005: Foundations of Software Technology and Theoretical Computer Science*. XIV, 566 pages. 2005.
- Vol. 3820: L.T. Yang, X. Zhou, W. Zhao, Z. Wu, Y. Zhu, M. Lin (Eds.), *Embedded Software and Systems*. XXVIII, 779 pages. 2005.
- Vol. 3819: P. Van Hentenryck (Ed.), *Practical Aspects of Declarative Languages*. X, 231 pages. 2005.
- Vol. 3818: S. Grumbach, L. Sui, V. Vianu (Eds.), *Advances in Computer Science – ASIAN 2005*. XIII, 294 pages. 2005.
- Vol. 3816: G. Chakraborty (Ed.), *Distributed Computing and Internet Technology*. XXI, 606 pages. 2005.
- Vol. 3815: E.A. Fox, E.J. Neuhold, P. Premssmit, V. Wu-wongse (Eds.), *Digital Libraries: Implementing Strategies and Sharing Experiences*. XVII, 529 pages. 2005.
- Vol. 3814: M. Maybury, O. Stock, W. Wahlster (Eds.), *Intelligent Technologies for Interactive Entertainment*. XV, 342 pages. 2005. (Sublibrary LNAI).
- Vol. 3813: R. Molva, G. Tsudik, D. Westhoff (Eds.), *Security and Privacy in Ad-hoc and Sensor Networks*. VIII, 219 pages. 2005.
- Vol. 3810: Y.G. Desmedt, H. Wang, Y. Mu, Y. Li (Eds.), *Cryptology and Network Security*. XI, 349 pages. 2005.
- Vol. 3809: S. Zhang, R. Jarvis (Eds.), *AI 2005: Advances in Artificial Intelligence*. XXVII, 1344 pages. 2005. (Sublibrary LNAI).
- Vol. 3808: C. Bento, A. Cardoso, G. Dias (Eds.), *Progress in Artificial Intelligence*. XVIII, 704 pages. 2005. (Sublibrary LNAI).
- Vol. 3807: M. Dean, Y. Guo, W. Jun, R. Kaschek, S. Krishnaswamy, Z. Pan, Q.Z. Sheng (Eds.), *Web Information Systems Engineering – WISE 2005 Workshops*. XV, 275 pages. 2005.
- Vol. 3806: A.H. H. Ngu, M. Kitsuregawa, E.J. Neuhold, J.-Y. Chung, Q.Z. Sheng (Eds.), *Web Information Systems Engineering – WISE 2005*. XXI, 771 pages. 2005.
- Vol. 3805: G. Subsol (Ed.), *Virtual Storytelling*. XII, 289 pages. 2005.
- Vol. 3804: G. Bebis, R. Boyle, D. Koracin, B. Parvin (Eds.), *Advances in Visual Computing*. XX, 755 pages. 2005.
- Vol. 3803: S. Jajodia, C. Mazumdar (Eds.), *Information Systems Security*. XI, 342 pages. 2005.
- Vol. 3802: Y. Hao, J. Liu, Y.-P. Wang, Y.-m. Cheung, H. Yin, L. Jiao, J. Ma, Y.-C. Jiao (Eds.), *Computational Intelligence and Security, Part II*. XLII, 1166 pages. 2005. (Sublibrary LNAI).

- Vol. 3801: Y. Hao, J. Liu, Y.-P. Wang, Y.-m. Cheung, H. Yin, L. Jiao, J. Ma, Y.-C. Jiao (Eds.), *Computational Intelligence and Security, Part I. XLI*, 1122 pages. 2005. (Sublibrary LNAI).
- Vol. 3799: M. A. Rodríguez, I.F. Cruz, S. Levashkin, M.J. Egenhofer (Eds.), *GeoSpatial Semantics. X*, 259 pages. 2005.
- Vol. 3798: A. Dearle, S. Eisenbach (Eds.), *Component Deployment. X*, 197 pages. 2005.
- Vol. 3797: S. Maitra, C. E. V. Madhavan, R. Venkatesan (Eds.), *Progress in Cryptology - INDOCRYPT 2005. XIV*, 417 pages. 2005.
- Vol. 3796: N.P. Smart (Ed.), *Cryptography and Coding. XI*, 461 pages. 2005.
- Vol. 3795: H. Zhuge, G.C. Fox (Eds.), *Grid and Cooperative Computing - GCC 2005. XXI*, 1203 pages. 2005.
- Vol. 3794: X. Jia, J. Wu, Y. He (Eds.), *Mobile Ad-hoc and Sensor Networks. XX*, 1136 pages. 2005.
- Vol. 3793: T. Conte, N. Navarro, W.-m. W. Hwu, M. Valero, T. Ungerer (Eds.), *High Performance Embedded Architectures and Compilers. XIII*, 317 pages. 2005.
- Vol. 3792: I. Richardson, P. Abrahamsson, R. Messnarz (Eds.), *Software Process Improvement. VIII*, 215 pages. 2005.
- Vol. 3791: A. Adi, S. Stoutenburg, S. Tabet (Eds.), *Rules and Rule Markup Languages for the Semantic Web. X*, 225 pages. 2005.
- Vol. 3790: G. Alonso (Ed.), *Middleware 2005. XIII*, 443 pages. 2005.
- Vol. 3789: A. Gelbukh, Á. de Albornoz, H. Terashima-Marín (Eds.), *MICAI 2005: Advances in Artificial Intelligence. XXVI*, 1198 pages. 2005. (Sublibrary LNAI).
- Vol. 3788: B. Roy (Ed.), *Advances in Cryptology - ASIACRYPT 2005. XIV*, 703 pages. 2005.
- Vol. 3787: D. Kratsch (Ed.), *Graph-Theoretic Concepts in Computer Science. XIV*, 470 pages. 2005.
- Vol. 3785: K.-K. Lau, R. Banach (Eds.), *Formal Methods and Software Engineering. XIV*, 496 pages. 2005.
- Vol. 3784: J. Tao, T. Tan, R.W. Picard (Eds.), *Affective Computing and Intelligent Interaction. XIX*, 1008 pages. 2005.
- Vol. 3783: S. Qing, W. Mao, J. Lopez, G. Wang (Eds.), *Information and Communications Security. XIV*, 492 pages. 2005.
- Vol. 3782: K.-D. Althoff, A. Dengel, R. Bergmann, M. Nick, T. Roth-Berghofer (Eds.), *Professional Knowledge Management. XXIII*, 739 pages. 2005. (Sublibrary LNAI).
- Vol. 3781: S.Z. Li, Z. Sun, T. Tan, S. Pankanti, G. Chollet, D. Zhang (Eds.), *Advances in Biometric Person Authentication. XI*, 250 pages. 2005.
- Vol. 3780: K. Yi (Ed.), *Programming Languages and Systems. XI*, 435 pages. 2005.
- Vol. 3779: H. Jin, D. Reed, W. Jiang (Eds.), *Network and Parallel Computing. XV*, 513 pages. 2005.
- Vol. 3778: C. Atkinson, C. Bunse, H.-G. Gross, C. Peper (Eds.), *Component-Based Software Development for Embedded Systems. VIII*, 345 pages. 2005.
- Vol. 3777: O.B. Lupanov, O.M. Kasim-Zade, A.V. Chaskin, K. Steinhöfel (Eds.), *Stochastic Algorithms: Foundations and Applications. VIII*, 239 pages. 2005.
- Vol. 3776: S.K. Pal, S. Bandyopadhyay, S. Biswas (Eds.), *Pattern Recognition and Machine Intelligence. XXIV*, 808 pages. 2005.
- Vol. 3775: J. Schönwälder, J. Serrat (Eds.), *Ambient Networks. XIII*, 281 pages. 2005.
- Vol. 3774: G. Bierman, C. Koch (Eds.), *Database Programming Languages. X*, 295 pages. 2005.
- Vol. 3773: A. Sanfeliu, M.L. Cortés (Eds.), *Progress in Pattern Recognition, Image Analysis and Applications. XX*, 1094 pages. 2005.
- Vol. 3772: M.P. Consens, G. Navarro (Eds.), *String Processing and Information Retrieval. XIV*, 406 pages. 2005.
- Vol. 3771: J.M.T. Romijn, G.P. Smith, J. van de Pol (Eds.), *Integrated Formal Methods. XI*, 476 pages. 2005.
- Vol. 3770: J. Akoka, S.W. Liddle, I.-Y. Song, M. Bertolotto, I. Comyn-Wattiau, W.-J. van den Heuvel, M. Kolp, J. Trujillo, C. Kop, H.C. Mayr (Eds.), *Perspectives in Conceptual Modeling. XXII*, 476 pages. 2005.
- Vol. 3769: D.A. Bader, M. Parashar, V. Sridhar, V.K. Prasanna (Eds.), *High Performance Computing - HiPC 2005. XXVIII*, 550 pages. 2005.
- Vol. 3768: Y.-S. Ho, H.J. Kim (Eds.), *Advances in Multimedia Information Processing - PCM 2005, Part II. XXVIII*, 1088 pages. 2005.
- Vol. 3767: Y.-S. Ho, H.J. Kim (Eds.), *Advances in Multimedia Information Processing - PCM 2005, Part I. XXVIII*, 1022 pages. 2005.
- Vol. 3766: N. Sebe, M.S. Lew, T.S. Huang (Eds.), *Computer Vision in Human-Computer Interaction. X*, 231 pages. 2005.
- Vol. 3765: Y. Liu, T. Jiang, C. Zhang (Eds.), *Computer Vision for Biomedical Image Applications. X*, 563 pages. 2005.
- Vol. 3764: S. Tixeuil, T. Herman (Eds.), *Self-Stabilizing Systems. VIII*, 229 pages. 2005.
- Vol. 3762: R. Meersman, Z. Tari, P. Herrero (Eds.), *On the Move to Meaningful Internet Systems 2005: OTM 2005 Workshops. XXXI*, 1228 pages. 2005.
- Vol. 3761: R. Meersman, Z. Tari (Eds.), *On the Move to Meaningful Internet Systems 2005: CoopIS, DOA, and ODBASE, Part II. XXVII*, 653 pages. 2005.
- Vol. 3760: R. Meersman, Z. Tari (Eds.), *On the Move to Meaningful Internet Systems 2005: CoopIS, DOA, and ODBASE, Part I. XXVII*, 921 pages. 2005.
- Vol. 3759: G. Chen, Y. Pan, M. Guo, J. Lu (Eds.), *Parallel and Distributed Processing and Applications - ISPA 2005 Workshops. XIII*, 669 pages. 2005.
- Vol. 3758: Y. Pan, D.-x. Chen, M. Guo, J. Cao, J.J. Dongarra (Eds.), *Parallel and Distributed Processing and Applications. XXIII*, 1162 pages. 2005.
- Vol. 3757: A. Rangarajan, B. Vemuri, A.L. Yuille (Eds.), *Energy Minimization Methods in Computer Vision and Pattern Recognition. XII*, 666 pages. 2005.
- Vol. 3756: J. Cao, W. Nejdl, M. Xu (Eds.), *Advanced Parallel Processing Technologies. XIV*, 526 pages. 2005.

APWeb 2006 Workshop Chair's Message

APWeb conferences are premier international conferences on theoretical and practical aspects of Web engineering with a focus on the Asia Pacific region. Previous APWeb conferences were held in Beijing (1998), Hong Kong (1999), Xi'an (2000), Changsha (2001), Xi'an (2003), Hangzhou (2004) and Shanghai (2005). From this year, under the leadership of APWeb 2006 General Chair Masaru Kitsuregawa, APWeb will have co-located workshops on specialized and emerging topics. It is my pleasure to serve as the Workshop Chair for APWeb 2006.

This volume comprises papers from four APWeb 2006 workshops:

1. Workshop on Metropolis/Enterprise Grid and Applications (MEGA)
2. Workshop on Sensor Network (IWSN)
3. Workshop on Web-Based Internet Computing for Science and Engineering (ICSE)
4. Workshop on XML Research and Applications (XRA)

These four workshops were selected from a public call-for-proposals process. The workshop organizers put a tremendous amount of effort into soliciting and selecting research papers with a balance of high quality and new ideas and new applications. We have asked all workshops to follow a rigid paper selection process, including the procedure to ensure that any Program Committee members (including workshop Program Committee Chairs) are excluded from the paper review process of any papers they are involved in. A requirement about the overall paper acceptance ratio was also imposed on all workshops. This is the first year that APWeb experimented with a workshop program. I hope you will enjoy this program.

I am very grateful to Heng Tao Shen, Hong Gao, Winnie Cheng, Miranda Lee, Xin Zhan, Wenjie Zhang, Yanchun Zhang, Qing Li, Rikun Wang and many other people for their great effort in supporting the conference organization. I would like to take this opportunity to thank all workshop organizers and Program Committee members for their great effort in putting together the workshop program of APWeb 2006, and in particular Minglu Li, Jinbao Li, Jun Ni and Wei Wang.

January 2006

Jeffrey X. Yu
APWeb 2006 Workshop Chair

International Workshop on XML Research and Applications (XRA 2006) Program Chairs' Message

The First International Workshop on XML Research and Applications (XRA 2006) was held in Harbin, China, on January 15, 2006, in conjunction with the 8th Asia Pacific Web Conference (APWEB 2006). XRA 2006 provided a forum for international researchers and practitioners interested in XML to meet and exchange research ideas and results. It also provided an opportunity for participants to present their research papers and to take part in open discussions. The workshop received 45 submissions from 10 countries and regions. All submissions were peer reviewed by at least two Program Committee members. The Program Committee selected 12 full papers and 8 short papers for inclusion in the proceedings. The accepted papers covered a wide range of research topics and novel applications related to XML. Among them, the paper "Early Evaluating XML Trees in Object Repositories" by Sangwon Park was chosen for the best paper award.

We are grateful to National ICT Australia (NICTA) for sponsoring the workshop and donating the prize for the best paper award. We would also like to thank all authors who submitted papers and all the participants in the workshop program. We are grateful to members of the Program Committee who contributed their expertise and ensured the high quality of the reviewing process. We are thankful to the APWEB organizers for their support and local arrangement.

January 2006

Wei Wang
Raymond Wong

International Workshop on Sensor Networks (IWSN 2006) Program Chairs' Message

Recent advancements in digital electronics, microprocessors and wireless technologies enable the creation of small and cheap sensors which have processor, memory and wireless communication ability. This accelerates the development of large-scale sensor networks and brings new challenges in ways we do computing and service. The First International Workshop on Sensor Networks (IWSN 2006) provided a forum for researchers to exchange information regarding advancements in the state of the art and practice of sensor networks, as well as to identify the emerging research topics and directions for future research and development work.

IWSN 2006 received 126 submissions from the USA, Korea, Australia, China among other countries, and selected 24 regular papers and 14 short papers for publication after a rigorous and careful review process. The papers accepted cover a wide range of exciting topics, including protocol, data management, security, and applications.

The excellent program of IWSN 2006 comes from the hard work and collective effort of many PC members and organizers. We would like to express our special thanks to Heilongjiang University, China, and Harbin Institute of Technology, China. We would also like to thank all the authors, many of whom traveled a great distance to participate in this workshop and make their valuable contributions. We hope that all participants enjoyed the technical program and the culture of Harbin. We warmly welcome your comments and suggestions.

January 2006

Jinbao Li
Yingshu Li
Xiaohua Jia

International Workshop on Metropolis/Enterprise Grid and Applications (MEGA 2006) General Chairs' Message

In the last few years, the field of metropolis/enterprise grid and applications has been developing very rapidly. This goes along with the growing popularity of the Internet, the availability of powerful computers and high-speed networks, and is changing the way we do computing and service. The First International Workshop on Metropolis/Enterprise Grid and Applications (MEGA 2006) was held in Harbin, in cooperation with the 8th Asia Pacific Web Conference (APWEB 2006), during January 16-18, 2006.

MEGA 2006 provided a forum to present current and future work as well as to exchange research ideas by researchers, developers, practitioners, and users in metropolis/enterprise grid and applications. It was created with the firm objective of becoming a major international forum of discussion of the theory and applications of the above-mentioned fields. MEGA 2006 received 63 papers from the USA, Korea and China, and selected 12 regular papers and 18 short papers from these three countries after a strict and careful review process. The papers accepted covered a wide range of exciting topics, including architecture, software, networking, and applications.

The excellent program was the result of the hard work and collective effort of many people and organizations. We would like to express our special thanks to the Science and Technology Commission of Shanghai Municipality, Shanghai Jiao Tong University, China, and the Technical Committee on Services Computing of IEEE Computer Society. We would also like to thank all the authors, many of whom traveled a great distance to participate in this workshop and make their valuable contributions. We hope that all participants enjoyed the program and found it worthwhile. We warmly welcome any comments and suggestions to improve our work.

January 2006

Minglu Li
Xian-He Sun
Junwei Wu
Liang-Jie Zhang

International Workshop on Web-Based Internet Computing for Science and Engineering (ICSE 2006) Organizers' Message

Computational science is an important field with multidisciplinary research. It focuses on algorithm development and implementations of computing for scientists and engineers. Its impact is already being felt in many science and engineering disciplines. Current research in computational science requires multidisciplinary knowledge, not only in sciences and engineering but also in cutting-edge computing technologies. Many science and engineering explorations rely on mature, efficient computational algorithms and implementations, practical and reliable numerical methods, and large-scale computation systems.

With the above paradigm and goal of promoting Web-Based scientific and engineering computing, we organized the International Workshop on Web-Based Internet Computing for Science and Engineering (ICSE 2006), held on January 15, 2006, Harbin, China, in conjunction with The 8th Asia Pacific Web Conference (APWEB 2006).

The workshop focuses on scientific computations and applications on the Web-Based Internet, enhancing cyberinfrastructure-based scientific and engineering collaborations. It offered academic researchers, developers, and practitioners an opportunity to discuss various aspects of computational science and engineering-related computational methods and problem-solving techniques for science and engineering research.

We selected about 40 regular and 18 short papers contributed from 8 countries or regions, representing 66 universities or institutions. The selected papers in these proceedings cover a broad range of research topics presented in four presentation sessions and two poster sessions.

We would like to thank the members of the Program Committee and the additional reviewers. We are grateful to the following APWEB 2006 organizers, Masaru Kitsuregawa, Jianzhong Li, Xiaofang Zhou, Heng Tao Shen, Chengfei Liu, and Ge Yu. A special thanks to APWeb 2006 workshop organizer Jeffrey X. Yu, who provided valuable support and help in promoting this workshop.

The workshop organizers deeply appreciate President Zhigang Liu and Vice-President Wei Lin of Harbin Engineering University for their support and sponsorship of this workshop.

Thanks go to all who contributed their papers and provided unforgettable cooperation.

January 2006

General Co-chairs: Jack Dongarra and Yao Zhen
Program Co-chairs: Jun Ni and Shaobin Huang

Organization

International Workshop on XML Research and Applications (XRA 2006)

Program Co-chairs

Wei Wang, University of New South Wales, Australia

Raymond Wong, National ICT Australia, Australia

Program Committee

James Bailey, University of Melbourne, Australia

Sourav S. Bhowmick, Nanyang Technological University, Singapore

Shuyao Chien, Yahoo! Inc., USA

Gillian Dobbie, University of Auckland, New Zealand

Patrick Hung, University of Ontario IT, Canada

Haifeng Jiang, IBM Almaden Research Lab, USA

Hasan Jamil, Wayne State University, USA

Franky Lam, National ICT Australia, Australia

Xiaofeng Meng, Renmin University of China, China

Mukesh Mohania, IBM India Research Lab, India

Mehmet Orgun, Macquarie University, Australia

Keun Ho Ryu, Chungbuk National University, South Korea

Vlad Tosic, Lakehead University, Canada

Guoren Wang, Northeastern University, China

International Workshop on Sensor Networks (IWSN 2006)

Program Committee Co-chairs

Jinbao Li, Heilongjiang University, China

Yingshu Li, Georgia State University, USA

Xiaohua Jia, City University of Hong Kong, Hong Kong

Program Committee

S. Makki, University of Toledo, USA

Weifa Liang, Australian National University, Australia

Xuemin Lin, University of New South Wales, Australia

Ophir Frieder, Illinois Institute of Technology, USA

Yongbing Zhang, University of Tsukuba, Japan

Weijia Jia, City University of Hong Kong, Hong Kong

Chuanhe Huang, Wuhan University, China

Limin Sun, Chinese Academy of Sciences, China

Li Cui, Chinese Academy of Sciences, China
Bin Zhang, Northeastern University, China
Jinli Cao, La Trobe University, Australia
Xiao Bin, Hong Kong Polytechnic University, Hong Kong
Hong Gao, Harbin Institute of Technology, China
Weili Wu, University of Texas at Dallas, USA
Longjiang Guo, Heilongjiang University, China
Hua Wang, University of Southern Queensland, Australia
Qing Zhang, e-Health Center/CSIRO, Australia

International Workshop on Metropolis/Enterprise Grid and Applications (MEGA 2006)

General Co-chairs

Minglu Li, Shanghai Jiao Tong University, China
Xian-He Sun, Illinois Institute of Technology, USA
Junwei Wu, Science and Technology Commission of Shanghai Municipality, China
Liang-Jie Zhang, IBM T.J. Watson Research Center, USA

Program Committee

Wentong Cai, Nanyang Technological University, Singapore
Jiannong Cao, The Hong Kong Polytechnic University, Hong Kong
Xiaowu Chen, Beihang University, China
Qianni Deng, Shanghai Jiao Tong University, China
Guangrong Gao, University of Delaware Newark, USA
Yadong Gui, Shanghai Supercomputer Center, China
Minyi Guo, The University of Aizu, Japan
Weijia Jia, City University of Hong Kong, Hong Kong
Changjun Jiang, Tongji University, China
Hai Jin, Huazhong University of Science and Technology, China
Chung-Ta King, National Tsing Hua University, Taiwan
Francis C. M. Lau, The University of Hong Kong, Hong Kong
Jysoo Lee, KISTI, Korea
Jianzhong Li, Harbin Institute of Technology, China
Xinda Lu, Shanghai Jiao Tong University, China
Junzhou Luo, Southeast University, China
Xiangxu Meng, Shandong University, China
Lionel M. Ni, The Hong Kong University of Science and Technology, Hong Kong
Yi Pan, Georgia State University, USA
Hong Shen, Japan Advanced Institute of Science and Technology, Japan
Weiqin Tong, Shanghai University, China
Cho-Li Wang, The University of Hong Kong, Hong Kong
Xingwei Wang, Northeastern University, China
Jie Wu, Florida Atlantic University, USA

Xinhong Wu, Shanghai Urban Transportation Information Center, China
Zhaohui Wu, ZheJiang University, China
Nong Xiao, National University of Defense Technology, China
Chengzhong Xu, Wayne State University, USA
Laurence Tianruo Yang, St. Francis Xavier University, Canada
Ling Zhang, South China University of Technology, China
Xiaodong Zhang, Ohio State University, USA
Yanchun Zhang, Victoria University, Australia
Aoying Zhou, Fudan University, China
Xiaofang Zhou, University of Queensland, Australia
Hai Zhuge, Institute of Computing Technology, CAS, China

International Workshop on Web-Based Internet Computing for Science and Engineering (ICSE 2006)

General Co-chairs

Jack Dongarra, University of Tennessee, USA
Yao Zhen, Zhejiang University, China

Program Co-chairs

Jun Ni, University of Iowa, USA
Shaobin Huang, Harbin Engineering University, China

Program Committee

Akiyo Nadamoto, NICT, Japan
Alex Vazhenin, University of Aizu, Japan
Beniamino Di Martino, Second University of Naples, Italy
Changsong Sun, Harbin Eng. University, China
Choi-Hong Lai, University of Greenwich, UK
Daxin Liu, Harbin Eng. University, China
Deepak Srivastava, NASA Ames Research Center USA
Enrique Quintana-Orti, University of Jaime I, Spain
George A. Gravvanis, Democritus University of Thrace, Greece
Gudula Rnger, Chemnitz University of Technology, Germany
Guochang Gu, Harbin Eng. University, China
Anand Padmanabhan, University of Iowa, USA
Hamid R. Arabnia, University of Georgia, USA
Jack Dongarra, University of Tennessee, USA
Joan Lu, The University of Huddersfield, UK
Joe Zhang, University of Southern Mississippi, Hattiesburg, USA
Jerry Jenkin, CFD Research Corporation, USA
Julien Langou, University of Tennessee, USA
Laurence T. Yang, St. Francis Xavier University, Canada

Luciano Tarricone, University of Lecce, Italy
M. P. Anantram, NASA Ames Research Center USA
Michael Ng, University of Hong Kong, China
Nadamoto Akiyo, NICT, Japan
Rodrigo de Mello, University of Sao Paulo, Brazil
Sabin Tabirca, University College Cork, Ireland
Shaowen Wang, University of Iowa
Thomas Rauber, University of Bayreuth, Germany
Layne Watson, Virginia Tech. USA
Xing Cai, University of Oslo, Norway
Yi Pan, George State University, USA
Jin Li, Harbin Engineering University, China
Junwei Cao, MIT, USA
Wenyang Duan, Harbin Engineering University, China
Xing Cai, Harbin Engineering University, China

Table of Contents

International Workshop on XML Research and Applications (XRA 2006)

Clustered Absolute Path Index for XML Document: On Efficient Processing of Twig Queries <i>Hongqiang Wang, Jianzhong Li, Hongzhi Wang</i>	1
Positioning-Based Query Translation Between SQL and XQL with Location Counter <i>Joseph Fong, Wilfred Ng, San Kuen Cheung, Ivan Au</i>	11
Integrating XML Schema Language with Databases for B2B Collaborations <i>Taesoo Lim, Wookey Lee</i>	19
Functional Dependencies in XML Documents <i>Ping Yan, Teng Lv</i>	29
Querying Composite Events for Reactivity on the Web <i>François Bry, Michael Eckert, Paula-Lavinia Patrânjan</i>	38
Efficient Evaluation of XML Twig Queries <i>Ya-Hui Chang, Cheng-Ta Lee, Chieh-Chang Luo</i>	48
Early Evaluating XML Trees in Object Repositories <i>Sangwon Park</i>	58
Caching Frequent XML Query Patterns <i>Xin Zhan, Jianzhong Li, Hongzhi Wang, Zhenying He</i>	68
Efficient Evaluation of Distance Predicates in XPath Full-Text Query <i>Hong Chen, Xiaoling Wang, Aoying Zhou</i>	76
A Web Classification Framework Based on XSLT <i>Atakan Kurt, Engin Tozal</i>	86
Logic-Based Association Rule Mining in XML Documents <i>Hong-Chen Liu, John Zeleznikow, Hasan M. Jamil</i>	97

XML Document Retrieval System Based on Document Structure and Image Content for Digital Museum <i>Jae-Woo Chang, Yeon-Jung Kim</i>	107
Meta Modeling Approach for XML Based Data Integration <i>Ouyang Song, Huang Yi</i>	112
XML and Knowledge Based Process Model Reuse and Management in Business Intelligence System <i>Luan Ou, Hong Peng</i>	117
Labeling XML Nodes in RDBMS <i>Moad Maghaydah, Mehmet A. Orgun</i>	122
Feature Extraction and XML Representation of Plant Leaf for Image Retrieval <i>Qingfeng Wu, Changle Zhou, Chaonan Wang</i>	127
A XML-Based Workflow Event Logging Mechanism for Workflow Mining <i>Kwanghoon Kim</i>	132
XML Clustering Based on Common Neighbor <i>Tian-yang Lv, Xi-zhe Zhang, Wan-li Zuo, Zheng-xuan Wang</i>	137
Modeling Dynamic Properties in the Layered View Model for XML Using XSemantic Nets <i>R. Rajugan, Elizabeth Chang, Ling Feng, Tharam S. Dillon</i>	142
VeriFLog: A Constraint Logic Programming Approach to Verification of Website Content <i>Jorge Coelho, Mário Florido</i>	148
International Workshop on Sensor Networks (IWSN 2006)	
Bandwidth Guaranteed Multi-tree Multicast Routing in Wireless Ad Hoc Networks <i>Huayi Wu, Xiaohua Jia, Yanxiang He, Chuanhe Huang</i>	157
Finding Event Occurrence Regions in Wireless Sensor Networks <i>Longjiang Guo, Jianzhong Li, Jinbao Li</i>	167
Energy Efficient Protocols for Information Dissemination in Wireless Sensor Networks <i>Dandan Liu, Xiaodong Hu, Xiaohua Jia</i>	176