Michael Beigl
Stephen Intille
Jun Rekimoto
Hideyuki Tokuda (Eds.)

UbiComp 2005: Ubiquitous Computing

LNCS 3660

7th International Conference, UbiComp 2005
Tokyo, Japan, September 2005
Proceedings

Springer

Michael Beigl Stephen Intille
Jun Rekimoto Hideyuki Tokuda (Eds.)

UbiComp 2005: Ubiquitous Computing

7th International Conference, UbiComp 2005
Tokyo, Japan, September 11-14, 2005
Proceedings

Springer

Volume Editors

Michael Beigl
University of Karlsruhe
Institute for Telematics, TecO (Telecooperation Office)
Vincenz-Priessnitz-Straße 1, 76131 Karlsruhe, Germany
E-mail: michael@teco.uni-karsruhe.de

Stephen Intille
Massachusetts Institute of Technology
1 Cambridge Center, 4FL, Cambridge, MA 02142, USA
E-mail: intille@mit.edu

Jun Rekimoto
Sony Computer Science Laboratories, Inc.
3–14–13 Higashi-gotanda, Shinagawa-ku, Tokyo, 141–0022, Japan
E-mail: rekimoto@csl.sony.co.jp

Hideyuki Tokuda
Keio University
5322 Endo, Fujisawa, Kanagawa 252-8520, Japan
E-mail: hxt@sfc.keio.ac.jp

Library of Congress Control Number: 2005932242

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

ISSN 0302-9743
ISBN-10 3-540-28760-4 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-28760-5 Springer Berlin Heidelberg New York

Typesetting: Camera-ready by author, data conversion by Boller Mediendesign
Printed on acid-free paper SPIN: 11551201 06/3142 5 4 3 2 1 0

Preface

The 7th International Conference on Ubiquitous Computing (UbiComp 2005) marked the first time that this premier venue for original research contributions in ubiquitous computing was held in Asia. The Tokyo, Japan venue reflects the desire of the UbiComp community to make this conference series an international event that showcases the increasing amount of high-quality ubiquitous computing research that is taking place worldwide. As the field of ubiquitous computing has matured, the UbiComp Conference has gained significance worldwide, not only among researchers, but also with industry and general society.

This interest in the potential of ubiquitous computing to impact our lives has resulted in the creation of many new research programs in academia and industry. These efforts have, in turn, led to mass media coverage of efforts and, in some regions of the world, large-scale government-initiated collaborative efforts to explore the potential of these emerging technologies. These trends are reflected in the rise in the number of submissions to UbiComp 2005. This year the conference received 230 full papers, submitted almost equally from Asia (~100 submissions), North America and South America (~60 submissions) and Europe(~60 submissions), with the remainder being received from Australia and Africa. From among many high-quality submissions, the technical program committee accepted 22 papers. These papers were chosen based solely on the quality of their peer reviews using a double-blind review process.

The papers submitted to UbiComp 2005 showcase the diverse nature of ubiquitous computing research. Submissions covered topics such as human-computer interface (HCI), systems, context recognition and use, communications, and social implications and applications of computing. Methodologies included real-world deployments, laboratory experiments, ethnographic analysis, qualitative and quantitative evaluation, and theoretical explorations. The majority of the submissions covered more than one topic area and clearly filled a gap between more established research fields. Topics such as location systems and their applications, case studies and user interfaces, algorithms for recognition of context, and novel devices received the most attention by authors this year.

The Program Committee (PC) and reviewer pool was selected to provide the multi-disciplinary expertise required to evaluate original contributions in these research areas. We were fortunate to have an outstanding group of international researchers volunteering their time and expertise. The high quality of this conference was the result of their hard work and dedication to the advancement of the field. Due to the high number of submissions and the peer-review-process, PC members had to review an exceptionally large number of papers. Each PC member was responsible not only for reviews but also for monitoring the review process and facilitating discussion among external reviewers. External reviewers also had an unusually high review load with an average of six full papers. The comments of these experts provided feedback for the submission authors

and helped the Program Committee in their final selection decisions. We thank both the PC members and the external reviewers for delivering excellent and constructive reviews.

We would also like to extend our gratitude to the General Chair of the conference, Hideyuki Tokuda, who made this event possible and who helped with organizing the Program Committee meeting. Other members of our community also made outstanding contributions. Among them, Christian Decker supervised the pre-printing process of these proceedings, Albrecht Schmidt helped with the logistics of the Program Committee meeting (while simultaneously running Pervasive 2004), and Matthias Kranz and Rainer Fink provided valuable technical support during the meeting.

Our final word of thanks goes to all the 663 authors who submitted full papers to this conference. Presenting research work in a paper requires a great deal of effort. We hope that these authors were rewarded with insightful reviews and an enjoyable conference program.

July 2005 Michael Beigl, Stephen Intille, Jun Rekimoto

UbiComp 2005 Paper Review Process

The review process for UbiComp 2005 was very similar to the process used for UbiComp 2004 and was divided into 6 phases.

Phase 1: Program Committee (PC) Assignment and Reviewer Nomination

All papers submitted were assigned to a lead Program Committee member (PC) and a secondary PC reviewer, both selected from the Program Committee (PC). Care was taken that both PC members assigned did not have any conflict of interest with the paper and that the PC members had the appropriate expertise to review the paper. These two PC members in turn nominated two additional reviewers from a reviewer pool suggested by members of the PC and vetted by the PC chairs. PC and external reviewer paper loads were balanced by the PC chairs.

Phase 2: Quick Reject

To allow us to concentrate review efforts on papers with the best chances of being accepted, an additional quick reject phase was added before the review process. Papers where both PC members concurred that the paper was either wildly "out of scope" or "of unacceptably low quality to be accepted" were nominated for "quick reject" after a short discussion phase. In cases where at least two PC chairs also agreed, the papers were returned to the authors with just two reviews.

Phase 3: Reviews

PC chairs then processed all the papers that were not quick-rejected and allocated external reviewers based on the selections suggested by the PC members in Phase 1. A large effort was made to balance reviewing load across external reviewers. Because many papers crossed several research fields, care was taken to assign an expert for every area addressed in the paper. Reviewers were also carefully chosen to preserve anonymity and avoid institutional conflicts of interest. When necessary, reviewers could ask for additional reviews to be carried out. Papers received an average of five reviews in total – two from PC members and 3 from external reviewers.

Phase 4: On-line Discussion

After all of the reviews were received, the lead PC member for each paper coordinated an electronic discussion among the reviewers to reach a consensus as to the technical merit of the paper. When necessary, the reviewers could ask for additional reviews to be carried out to clarify certain aspects of the paper.

Phase 5: PC Meeting

A single PC meeting was held on May 8 in Munich, Germany. Attendance was a condition of acceptance to serve on the PC, and almost all of the PC members attended the meeting. At the meeting the committee examined all the papers that scored above a threshold (roughly corresponding to borderline weak reject) as well as some other papers with unusually high score spans. Each paper was discussed and rated. The final program was selected solely based on the criteria of scientific excellence.

Phase 6: Shepherding

To help authors with accepted papers interpret their reviews, all of the papers were allocated shepherds selected from the PC. These PC members guided the authors through the final revisions of their papers. Acceptance of papers was conditional on approval from the shepherds. This process helped considerably to improve the clarity of written presentation of work in a number of cases, and it ensured that the papers in these proceedings were revised to reflect the extensive feedback provided to the authors by the PC.

Conference Organization

Organizers

Honorary Conference Chair

Yuichiro Anzai	President, Keio University (Japan)

Conference Chair

Hideyuki Tokuda	Keio University (Japan)

Program Chairs

Michael Beigl	TecO, University of Karlsruhe (Germany)
Stephen Intille	MIT (USA)
Jun Rekimoto	SonyCSL (Japan)

Demonstration Chairs

Marc Langheinrich	ETH Zurich (Switzerland)
Yasuto Nakanishi	Tokyo University of Agriculture and Technology (Japan)

Poster Chairs

Elaine M. Huang	Georgia Institute of Technology (USA)
Tsutomu Terada	Osaka University (Japan)

Video Chairs

Masayoshi Ohhashi	KDDI R&D Labs (Japan)
Atau Tanaka	SonyCSL Paris (France)

Workshop Chairs

Yoshito Tobe	Tokyo Denki University (Japan)
Khai N. Truong	Georgia Institute of Technology (USA)

Doctoral Colloquium Chair

Gabriele Kotsis	University of Linz (Austria)

Student Volunteers Chair

Yoshihiro Kawahara	The University of Tokyo (Japan)

Treasurer Chair

Kazunori Takashio	Keio University (Japan)

Local Arrangements Chair

Masateru Minami	Shibaura Institute of Technology (Japan)

Publicity Chair

Koichi Kurumatani	AIST (Japan)

Publications Chair

Christian Decker	TecO, University of Karlsruhe (Germany)

Webmaster

Michael Beigl	TecO, University of Karlsruhe (Germany)
Daisuke Maruyama	Keio University (Japan)
Shunsaku Yamazaki	Keio University (Japan)

Sponsors

Gold Sponsors	KDDI R&D Labs
	NTT DoCoMo
	NEC
Silver Sponsors	Fuji Xerox
	Fujitsu
	Intel
	Microsoft
Bronze Sponsors	Crossbow
	IBM
	Mitsubishi Electric
	Uchida
	NTT
	DNP
	Ubitec
	Panasonic
	Toshiba
	Hitachi
	CiscoSystems
	Ubiquitous Networking Forum

Program Committee

Gregory Abowd	Georgia Institute of Technology (USA)
Christian Becker	University of Stuttgart (Germany)
Gaetano Borriello	University of Washington and Intel Research Seattle (USA)
Roy H. Campbell	University of Illinois at Urbana Champaign (USA)
Nigel Davies	Lancaster University (UK)
Paul Dourish	University of California (Irvine (USA)
W. Keith Edwards	Georgia Institute of Technology (USA)
Alois Ferscha	University of Linz (Austria)
Geraldine Fitzpatrick	University of Sussex (UK)
Masaaki Fukumoto	NTT DoCoMo (Japan)
Hans Gellersen	Lancaster University (UK)
Scott Hudson	Carnegie Mellon University (USA)
Gabriele Kotsis	University of Linz (Austria)
John Krumm	Microsoft Research (USA)
Anthony LaMarca	Intel Research Seattle (USA)
Marc Langheinrich	ETH Zurich (Switzerland)
Tom Rodden	University of Nottingham (UK)
Ichiro Satoh	National Institute of Informatics (Japan)
Bernt Schiele	Darmstadt University of Technology (Germany)
Chris Schmandt	Massachusetts Institute of Technology (USA)
Albrecht Schmidt	University of Munich (Germany)
Itiro Siio	Tamagawa University (Japan)
Mirjana Spasojevic	Hewlett-Packard Labs (USA)
Yasuyuki Sumi	Kyoto University (Japan)
Yoshito Tobe	Tokyo Denki University (Japan)
Allison Woodruff	Intel Research (USA)
Michiaki Yasumura	Keio University (Japan)

Reviewers

Ken Anderson	Intel Research (USA)
Paul Aoki	Palo Alto Research Center (PARC) (USA)
Jakob Bardram	University of Aarhus (Denmark)
John Barton	IBM Research (USA)
Martin Bauer	Universität Stuttgart (Germany)
Michael Beigl	University of Karlsruhe (Germany)
Genevieve Bell	Intel Corporation (USA)
Alastair Beresford	University of Cambridge (UK)
Mark Billinghurst	University of Canterbury (New Zealand)
Philippe Bonnet	University of Copenhagen (Denmark)

Barry Brown	University of Glasgow (UK)
Matthew Chalmers	University of Glasgow (UK)
Luigina Ciolfi	Interaction Design Centre, University of Limerick (Ireland)
Sunny Consolvo	Intel Research Seattle (USA)
Andy Crabtree	University of Nottingham (UK)
Christian Decker	TecO, University of Karlsruhe (Germany)
Anind Dey	Carnegie Mellon University (USA)
Carl Ellison	Microsoft (USA)
Kenneth Fishkin	Intel Research Seattle (USA)
Christian Floerkemeier	ETH Zurich (Switzerland)
James Fogarty	Carnegie Mellon University (USA)
Adrian Friday	Lancaster University (UK)
Kaori Fujinami	Waseda University (Japan)
Dipak Ghosal	University of California, Davis (USA)
William Griswold	UCSD (USA)
Mike Hazas	Lancaster University (UK)
Jeffrey Hightower	Intel Research Seattle (USA)
Paul Holleis	University of Munich (Germany)
Lars Erik Holmquist	Viktoria Institute (Sweden)
Jason Hong	Carnegie Mellon University (USA)
Eva Hornecker	Interact Lab, University of Sussex, Falmer (UK)
Eric Horvitz	Microsoft Research (USA)
Tom Igoe	NYU / ITP (USA)
Mizuko Ito	Keio University (Japan)
Sadanori Ito	ATR (Japan)
Natalie Jeremijenko	UCSD (USA)
Rui Jose	University of Minho (Portugal)
Eiji Kamioka	National Institute of Informatics, Tokyo (Japan)
Nicky Kern	TU Darmstadt (Germany)
Boriana Koleva	University of Nottingham (UK)
Yasuyuki Kono	NAIST (Japan)
Gerd Kortuem	Lancaster University (UK)
Matthias Kranz	University of Munich (Germany)
Christian Kray	Lancaster University (UK)
Antonio Krüger	University of Münster (Germany)
Michael Kreutzer	TU Darmstadt (Germany)
Albert Krohn	University of Karlsruhe (Germany)
Shoji Kurakake	NTT DoCoMo R&D Center (Japan)
Spyros Lalis	University of Thessaly (Greece)
Mik Lamming	HP Laboratories Palo Alto (USA)
Scott Lederer	UC Berkeley (USA)

Darren Leigh	Mitsubishi Electric Research Laboratories (USA)
Lin Liao	University of Washington (USA)
Cristina Lopes	University of California, Irvine (USA)
Paul Luff	King's College London (UK)
Paul Lukowicz	UMIT (AT)
Carsten Magerkurth	Fraunhofer IPSI (Germany)
Scott Mainwaring	Intel Research (USA)
Jennifer Mankoff	Human Computer Interaction Institute, Carnegie Mellon University (USA)
Natalia Marmasse	IBM Research, Israel (Israel)
Emmanuel Munguia Tapia	Massachusetts Institute of Technology (USA)
Tatsuo Nakajima	Waseda University (Japan)
Chandrasekhar Narayanaswami	IBM T. J. Watson (USA)
Mark W. Newman	Palo Alto Research Center (PARC) (USA)
Nobuhiko Nishio	Ritsumeikan University (Japan)
Nuria Oliver	Microsoft Research, Redmond (USA)
Joseph Paradiso	MIT (USA)
Kurt Partridge	PARC (USA)
Shwetak Patel	Georgia Institute of Technology (USA)
Donald Patterson	University of Washington (USA)
Alex Pentland	MIT Media Lab (USA)
Rosalind Picard	MIT Media Lab (USA)
Claudio Pinhanez	IBM Research, TJ Watson (USA)
Ivan Poupyrev	Sony CSL (Japan)
Nissanka Priyantha	Massachusetts Institute of Technology (USA)
Aaron Quigley	University College Dublin (Ireland)
Kay Römer	ETH Zurich (Switzerland)
Philip Robinson	TecO, University of Karlsruhe (Germany)
Yvonne Rogers	Indiana University (USA)
Michael Rohs	ETH Zurich (Switzerland)
Manuel Roman	DoCoMo Laboratories San Jose (USA)
Mark Rouncefield	Lancaster University (UK)
Enrico Rukzio	University of Munich (Germany)
Kathy Ryall	Mitsubishi Electric Research Labs (USA)
Karsten Schwan	Georgia Institute of Technology (USA)
James Scott	Intel Research Cambridge (UK)
Abigail Sellen	Microsoft Research (UK)
Steven Shafer	Microsoft Research (USA)
Louis Shue	Institute for Infocomm Research (Singapore)
Ian Smith	Intel Research Seattle (USA)
Mathias Stäger	Werarable Computing Lab, ETH Zurich (Switzerland)
Anthony Steed	University College London (UK)
Peter Steenkiste	Carnegie Mellon University (USA)

Oliver Storz	Lancaster University (UK)
Peter Tandler	Fraunhofer IPSI (Germany)
Hiroyuki Tarumi	Kagawa University (Japan)
Khai Truong	Georgia Institute of Technology (USA)
Brygg Ullmer	Louisiana State University (USA)
Harald Vogt	ETH Zurich (Switzerland)
Jay Warrior	Agilent Laboratories (USA)
Mark Weal	University of Southampton (UK)
Torben Weis	Berlin University of Technology (Germany)
Daniel Weld	University of Washington (USA)
Andy Wilson	Microsoft Research (USA)
Keiichi Yasumoto	Nara Institute of Science and Technology (Japan)
Tobias Zimmer	TecO, University of Karlsruhe (Germany)

Lecture Notes in Computer Science

For information about Vols. 1–3560

please contact your bookseller or Springer

Vol. 3687: S. Singh, M. Singh, C. Apte, P. Perner (Eds.), Pattern Recognition and Image Analysis, Part II. XXV, 809 pages. 2005.

Vol. 3686: S. Singh, M. Singh, C. Apte, P. Perner (Eds.), Pattern Recognition and Data Mining, Part I. XXVI, 689 pages. 2005.

Vol. 3672: C. Hankin, I. Siveroni (Eds.), Static Analysis. X, 369 pages. 2005.

Vol. 3671: S. Bressan, S. Ceri, E. Hunt, Z.G. Ives, Z. Bellahsène, M. Rys, R. Unland (Eds.), Database and XML Technologies. X, 239 pages. 2005.

Vol. 3664: C. Türker, M. Agosti, H.-J. Schek (Eds.), Peer-to-Peer, Grid, and Service-Orientation in Digital Library Architectures. X, 261 pages. 2005.

Vol. 3663: W. Kropatsch, R. Sablatnig, A. Hanbury (Eds.), Pattern Recognition. XIV, 512 pages. 2005.

Vol. 3662: C. Baral, G. Greco, N. Leone, G. Terracina (Eds.), Logic Programming and Nonmonotonic Reasoning. XIII, 454 pages. 2005. (Subseries LNAI).

Vol. 3660: M. Beigl, S. Intille, J. Rekimoto, H. Tokuda (Eds.), UbiComp 2005: Ubiquitous Computing. XVII, 394 pages. 2005.

Vol. 3659: J.R. Rao, B. Sunar (Eds.), Cryptographic Hardware and Embedded Systems – CHES 2005. XIV, 458 pages. 2005.

Vol. 3654: S. Jajodia, D. Wijesekera (Eds.), Data and Applications Security XIX. X, 353 pages. 2005.

Vol. 3653: M. Abadi, L.d. Alfaro (Eds.), CONCUR 2005 – Concurrency Theory. XIV, 578 pages. 2005.

Vol. 3649: W.M.P. van der Aalst, B. Benatallah, F. Casati, F. Curbera (Eds.), Business Process Management. XII, 472 pages. 2005.

Vol. 3648: J.C. Cunha, P.D. Medeiros (Eds.), Euro-Par 2005 Parallel Processing. XXXVI, 1299 pages. 2005.

Vol. 3645: D.-S. Huang, X.-P. Zhang, G.-B. Huang (Eds.), Advances in Intelligent Computing, Part II. XIII, 1010 pages. 2005.

Vol. 3644: D.-S. Huang, X.-P. Zhang, G.-B. Huang (Eds.), Advances in Intelligent Computing, Part I. XXVII, 1101 pages. 2005.

Vol. 3642: D. Ślezak, J. Yao, J.F. Peters, W. Ziarko, X. Hu (Eds.), Rough Sets, Fuzzy Sets, Data Mining, and Granular Computing, Part II. XXIV, 738 pages. 2005. (Subseries LNAI).

Vol. 3641: D. Ślezak, G. Wang, M.S. Szczuka, I. Düntsch, Y. Yao (Eds.), Rough Sets, Fuzzy Sets, Data Mining, and Granular Computing, Part I. XXIV, 742 pages. 2005. (Subseries LNAI).

Vol. 3639: P. Godefroid (Ed.), Model Checking Software. XI, 289 pages. 2005.

Vol. 3638: A. Butz, B. Fisher, A. Krüger, P. Olivier (Eds.), Smart Graphics. XI, 269 pages. 2005.

Vol. 3637: J. M. Moreno, J. Madrenas, J. Cosp (Eds.), Evolvable Systems: From Biology to Hardware. XI, 227 pages. 2005.

Vol. 3636: M.J. Blesa, C. Blum, A. Roli, M. Sampels (Eds.), Hybrid Metaheuristics. XII, 155 pages. 2005.

Vol. 3634: L. Ong (Ed.), Computer Science Logic. XI, 567 pages. 2005.

Vol. 3633: C. Bauzer Medeiros, M. Egenhofer, E. Bertino (Eds.), Advances in Spatial and Temporal Databases. XIII, 433 pages. 2005.

Vol. 3632: R. Nieuwenhuis (Ed.), Automated Deduction – CADE-20. XIII, 459 pages. 2005. (Subseries LNAI).

Vol. 3629: J.L. Fiadeiro, N. Harman, M. Roggenbach, J. Rutten (Eds.), Algebra and Coalgebra in Computer Science. XI, 457 pages. 2005.

Vol. 3628: T. Gschwind, U. Aßmann, O. Nierstrasz (Eds.), Software Composition. X, 199 pages. 2005.

Vol. 3627: C. Jacob, M.L. Pilat, P.J. Bentley, J. Timmis (Eds.), Artificial Immune Systems. XII, 500 pages. 2005.

Vol. 3626: B. Ganter, G. Stumme, R. Wille (Eds.), Formal Concept Analysis. X, 349 pages. 2005. (Subseries LNAI).

Vol. 3625: S. Kramer, B. Pfahringer (Eds.), Inductive Logic Programming. XIII, 427 pages. 2005. (Subseries LNAI).

Vol. 3624: C. Chekuri, K. Jansen, J.D.P. Rolim, L. Trevisan (Eds.), Approximation, Randomization and Combinatorial Optimization. XI, 495 pages. 2005.

Vol. 3623: M. Liśkiewicz, R. Reischuk (Eds.), Fundamentals of Computation Theory. XV, 576 pages. 2005.

Vol. 3621: V. Shoup (Ed.), Advances in Cryptology – CRYPTO 2005. XI, 568 pages. 2005.

Vol. 3620: H. Muñoz-Avila, F. Ricci (Eds.), Case-Based Reasoning Research and Development. XV, 654 pages. 2005. (Subseries LNAI).

Vol. 3619: X. Lu, W. Zhao (Eds.), Networking and Mobile Computing. XXIV, 1299 pages. 2005.

Vol. 3615: B. Ludäscher, L. Raschid (Eds.), Data Integration in the Life Sciences. XII, 344 pages. 2005. (Subseries LNBI).

Vol. 3614: L. Wang, Y. Jin (Eds.), Fuzzy Systems and Knowledge Discovery, Part II. XLI, 1314 pages. 2005. (Subseries LNAI).

Vol. 3613: L. Wang, Y. Jin (Eds.), Fuzzy Systems and Knowledge Discovery, Part I. XLI, 1334 pages. 2005. (Subseries LNAI).

Vol. 3612: L. Wang, K. Chen, Y. S. Ong (Eds.), Advances in Natural Computation, Part III. LXI, 1326 pages. 2005.

Vol. 3611: L. Wang, K. Chen, Y. S. Ong (Eds.), Advances in Natural Computation, Part II. LXI, 1292 pages. 2005.

Vol. 3610: L. Wang, K. Chen, Y. S. Ong (Eds.), Advances in Natural Computation, Part I. LXI, 1302 pages. 2005.

Vol. 3608: F. Dehne, A. López-Ortiz, J.-R. Sack (Eds.), Algorithms and Data Structures. XIV, 446 pages. 2005.

Vol. 3607: J.-D. Zucker, L. Saitta (Eds.), Abstraction, Reformulation and Approximation. XII, 376 pages. 2005. (Subseries LNAI).

Vol. 3606: V. Malyshkin (Ed.), Parallel Computing Technologies. XII, 470 pages. 2005.

Vol. 3604: R. Martin, H. Bez, M. Sabin (Eds.), Mathematics of Surfaces XI. IX, 473 pages. 2005.

Vol. 3603: J. Hurd, T. Melham (Eds.), Theorem Proving in Higher Order Logics. IX, 409 pages. 2005.

Vol. 3602: R. Eigenmann, Z. Li, S.P. Midkiff (Eds.), Languages and Compilers for High Performance Computing. IX, 486 pages. 2005.

Vol. 3599: U. Aßmann, M. Aksit, A. Rensink (Eds.), Model Driven Architecture. X, 235 pages. 2005.

Vol. 3598: H. Murakami, H. Nakashima, H. Tokuda, M. Yasumura, Ubiquitous Computing Systems. XIII, 275 pages. 2005.

Vol. 3597: S. Shimojo, S. Ichii, T.W. Ling, K.-H. Song (Eds.), Web and Communication Technologies and Internet-Related Social Issues - HSI 2005. XIX, 368 pages. 2005.

Vol. 3596: F. Dau, M.-L. Mugnier, G. Stumme (Eds.), Conceptual Structures: Common Semantics for Sharing Knowledge. XI, 467 pages. 2005. (Subseries LNAI).

Vol. 3595: L. Wang (Ed.), Computing and Combinatorics. XVI, 995 pages. 2005.

Vol. 3594: J.C. Setubal, S. Verjovski-Almeida (Eds.), Advances in Bioinformatics and Computational Biology. XIV, 258 pages. 2005. (Subseries LNBI).

Vol. 3593: V. Mařík, R. W. Brennan, M. Pěchouček (Eds.), Holonic and Multi-Agent Systems for Manufacturing. XI, 269 pages. 2005. (Subseries LNAI).

Vol. 3592: S. Katsikas, J. Lopez, G. Pernul (Eds.), Trust, Privacy and Security in Digital Business. XII, 332 pages. 2005.

Vol. 3591: M.A. Wimmer, R. Traunmüller, Å. Grönlund, K.V. Andersen (Eds.), Electronic Government. XIII, 317 pages. 2005.

Vol. 3590: K. Bauknecht, B. Pröll, H. Werthner (Eds.), E-Commerce and Web Technologies. XIV, 380 pages. 2005.

Vol. 3589: A M. Tjoa, J. Trujillo (Eds.), Data Warehousing and Knowledge Discovery. XVI, 538 pages. 2005.

Vol. 3588: K.V. Andersen, J. Debenham, R. Wagner (Eds.), Database and Expert Systems Applications. XX, 955 pages. 2005.

Vol. 3587: P. Perner, A. Imiya (Eds.), Machine Learning and Data Mining in Pattern Recognition. XVII, 695 pages. 2005. (Subseries LNAI).

Vol. 3586: A.P. Black (Ed.), ECOOP 2005 - Object-Oriented Programming. XVII, 631 pages. 2005.

Vol. 3584: X. Li, S. Wang, Z.Y. Dong (Eds.), Advanced Data Mining and Applications. XIX, 835 pages. 2005. (Subseries LNAI).

Vol. 3583: R.W. H. Lau, Q. Li, R. Cheung, W. Liu (Eds.), Advances in Web-Based Learning – ICWL 2005. XIV, 420 pages. 2005.

Vol. 3582: J. Fitzgerald, I.J. Hayes, A. Tarlecki (Eds.), FM 2005: Formal Methods. XIV, 558 pages. 2005.

Vol. 3581: S. Miksch, J. Hunter, E. Keravnou (Eds.), Artificial Intelligence in Medicine. XVII, 547 pages. 2005. (Subseries LNAI).

Vol. 3580: L. Caires, G.F. Italiano, L. Monteiro, C. Palamidessi, M. Yung (Eds.), Automata, Languages and Programming. XXV, 1477 pages. 2005.

Vol. 3579: D. Lowe, M. Gaedke (Eds.), Web Engineering. XXII, 633 pages. 2005.

Vol. 3578: M. Gallagher, J. Hogan, F. Maire (Eds.), Intelligent Data Engineering and Automated Learning - IDEAL 2005. XVI, 599 pages. 2005.

Vol. 3577: R. Falcone, S. Barber, J. Sabater-Mir, M.P. Singh (Eds.), Trusting Agents for Trusting Electronic Societies. VIII, 235 pages. 2005. (Subseries LNAI).

Vol. 3576: K. Etessami, S.K. Rajamani (Eds.), Computer Aided Verification. XV, 564 pages. 2005.

Vol. 3575: S. Wermter, G. Palm, M. Elshaw (Eds.), Biomimetic Neural Learning for Intelligent Robots. IX, 383 pages. 2005. (Subseries LNAI).

Vol. 3574: C. Boyd, J.M. González Nieto (Eds.), Information Security and Privacy. XIII, 586 pages. 2005.

Vol. 3573: S. Etalle (Ed.), Logic Based Program Synthesis and Transformation. VIII, 279 pages. 2005.

Vol. 3572: C. De Felice, A. Restivo (Eds.), Developments in Language Theory. XI, 409 pages. 2005.

Vol. 3571: L. Godo (Ed.), Symbolic and Quantitative Approaches to Reasoning with Uncertainty. XVI, 1028 pages. 2005. (Subseries LNAI).

Vol. 3570: A. S. Patrick, M. Yung (Eds.), Financial Cryptography and Data Security. XII, 376 pages. 2005.

Vol. 3569: F. Bacchus, T. Walsh (Eds.), Theory and Applications of Satisfiability Testing. XII, 492 pages. 2005.

Vol. 3568: W.-K. Leow, M.S. Lew, T.-S. Chua, W.-Y. Ma, L. Chaisorn, E.M. Bakker (Eds.), Image and Video Retrieval. XVII, 672 pages. 2005.

Vol. 3567: M. Jackson, D. Nelson, S. Stirk (Eds.), Database: Enterprise, Skills and Innovation. XII, 185 pages. 2005.

Vol. 3566: J.-P. Banâtre, P. Fradet, J.-L. Giavitto, O. Michel (Eds.), Unconventional Programming Paradigms. XI, 367 pages. 2005.

Vol. 3565: G.E. Christensen, M. Sonka (Eds.), Information Processing in Medical Imaging. XXI, 777 pages. 2005.

Vol. 3564: N. Eisinger, J. Małuszyński (Eds.), Reasoning Web. IX, 319 pages. 2005.

Vol. 3562: J. Mira, J.R. Álvarez (Eds.), Artificial Intelligence and Knowledge Engineering Applications: A Bioinspired Approach, Part II. XXIV, 636 pages. 2005.

Vol. 3561: J. Mira, J.R. Álvarez (Eds.), Mechanisms, Symbols, and Models Underlying Cognition, Part I. XXIV, 532 pages. 2005.

Table of Contents