

Anind Dey
Boicho Kokinov
David Leake
Roy Turner (Eds.)

LNAI 3554

Modeling and Using Context

5th International and Interdisciplinary Conference
CONTEXT 2005
Paris, France, July 2005, Proceedings



Springer

P15-53
M689.3
2005

Anind Dey Boicho Kokinov
David Leake Roy Turner (Eds.)

Modeling and Using Context

5th International and Interdisciplinary Conference
CONTEXT 2005
Paris, France, July 5-8, 2005
Proceedings



E200501620

 Springer

Volume Editors

Anind Dey

Carnegie Mellon University, School of Computer Science

Human Computer Interaction Institute

5000 Forbes Ave, Pittsburgh, PA, 15206, USA

E-mail: anind.dey@cs.cmu.edu

Boicho Kokinov

New Bulgarian University

Central and East European Center for Cognitive Science

Department of Cognitive Science and Psychology

21, Montevideo Str., Sofia 1638, Bulgaria

E-mail: bkokinov@nbu.bg

David Leake

Indiana University

Computer Science Department

Lindley Hall 215, 150 S. Woodlawn Ave, Bloomington, IN 47405-7104, USA

E-mail: leake@cs.indiana.edu

Roy Turner

University of Maine

Department of Computer Science

Orono, Maine 04469, USA

E-mail: rmt@umcs.maine.edu

Library of Congress Control Number: 2005928169

CR Subject Classification (1998): I.2, F.4.1, J.3, J.4

ISSN 0302-9743

ISBN-10 3-540-26924-X Springer Berlin Heidelberg New York

ISBN-13 978-3-540-26924-3 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

springeronline.com

© Springer-Verlag Berlin Heidelberg 2005

Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper SPIN: 11508373 06/3142 5 4 3 2 1 0

Lecture Notes in Artificial Intelligence

3554

Edited by J. G. Carbonell and J. Siekmann

Subseries of Lecture Notes in Computer Science

Preface

Context is of crucial importance for research and applications in many disciplines, as evidenced by many workshops, symposia, seminars, and conferences on specific aspects of context. The International and Interdisciplinary Conference on Modeling and Using Context (CONTEXT), the oldest conference series focusing on context, provides a unique interdisciplinary emphasis, bringing together participants from a wide range of disciplines, including artificial intelligence, cognitive science, computer science, linguistics, organizational science, philosophy, psychology, ubiquitous computing, and application areas such as medicine and law, to discuss and report on context-related research and projects.

Previous CONTEXT conferences were held in Rio de Janeiro, Brazil (1997), Trento, Italy (1999, LNCS 1688), Dundee, UK (2001, LNCS 2116), and Palo Alto, USA (2003, LNCS 2680). CONTEXT 2005 was held in Paris, France during July 5–8, 2005.

There was a strong response to the CONTEXT 2005 Call for Papers, with 120 submissions received. A careful review process assessed all submissions, with each paper first reviewed by the international Program Committee, and then reviewer discussions were initiated as needed to assure that the final decisions carefully considered all aspects of each paper. Reviews of submissions by the Program Chairs were supervised independently and anonymously, to assure fair consideration of all work. Out of the 120 submissions, 23 were selected as full papers for oral presentation, and 20 were selected as full papers for poster presentation. These outstanding papers are presented in this proceedings.

In addition to the papers presented here, the conference featured a rich program including invited talks and panel sessions, posters of late-breaking work, system demonstrations, a doctoral consortium, and workshops whose results are published in a separate volume.

We would like to thank the members of the Program Committee and all of our additional reviewers for their careful work in assuring the quality of the technical program. We would also like to thank the members of the Organizing Committee, and especially Patrick Brezillon, Organizing Committee Chair, for their tireless efforts; Elisabetta Zibetti, Workshops Chair, for organizing an exceptional workshops program; Chiara Ghidini for putting together an inaugural Doctoral Consortium; Leslie Ganet, Denesh Douglas and Christine Leproux for the wonderful website; and the Steering Committee for their guidance. Special thanks are due to Laure Leger and Mary Bazire for their preparation of this proceedings.

In addition, we would like to thank all the chairs, co-chairs and the many volunteers involved in making CONTEXT 2005 a successful conference. The conference is also grateful to the AAI, the Association Francaise pour le Contexte, CNRS, the Cognition et Usages Laboratory, FLAIRS, the Laboratory of Computer

VI Preface

Sciences, Paris 6, Nokia, Paris 8 University, Pierre and Marie Curie University, RISC, Supelec, and The University of Maine for their generous assistance to the conference.

We hope that the contributions reported here will illustrate the rich range of current contributions to context, and will provide a foundation for drawing on the best work from many areas in the next generation of research on context.

July 2005

Anind Dey
Boicho Kokinov
David Leake
Roy Turner

Organization

CONTEXT 2005 was hosted at the Pierre and Marie Curie University, Paris 6
<http://www.context-05.org/>

<i>Conference Chair</i>	Roy Turner (University of Maine, USA)
<i>Program Co-chairs</i>	Anind Dey (Carnegie Mellon University, USA) Boicho Kokinov (New Bulgarian University, Bulgaria) David Leake (Indiana University, USA)
<i>Managing Editors</i>	Mary Bazire (University of Paris 8, France) Laure Léger (University of Paris 8, France)

Organizing Committee

<i>Chairs</i>	Patrick Brézillon (University of Paris 6, France) Jean-Charles Pomerol (University of Paris 6, France) Charles Tijus (University of Paris 8, France)
---------------	--

Members

Web Site Management

Christine Leproux (University of Paris 8, France)
Leslie Ganet (University of Paris 8, France)
Denesh Douglas (University of Paris 6, France)

Communication Management

Chantal Perrichon (University of Paris 6, France)
Virginie Amiache (University of Paris 6, France)
Hind Boumlak (University of Paris 8, France)

Workshop Management

Elisabetta Zibetti (University of Paris 8, France)
Isabel Urdapilleta (University of Paris 8, France)
Patrick Yeu (University of Paris 8, France)

Doctoral Consortium Management

Chiara Ghindini (ITC-IRST, Italy)
Bich-Liên Doan (France)

Poster and Demonstration Session Management

Anind Dey (Carnegie Mellon University, USA)
Jean-Marc Meunier (University of Paris 8, France)

Volunteers Management

Jean-Marc Meunier (University of Paris 8, France)
Lionel Médini (University of Lyon 1, France)

Publicity Chair

Aline Chevalier (University of Paris 10, University of Paris 8, France)

Program Committee

- Aamodt Agnar (NTNU, Norway)
Akman Varol (Bilkent U., Turkey)
Ala-Siuru Pekka (VTT, Finland)
Andonova Elena
(New Bulgarian U., Bulgaria)
Arló Costa Horacio (CMU, USA)
Barnden John (U. Birmingham, UK)
Barsalou Larry (Emory U., USA)
Bauer Travis
(Sandia Laboratories, USA)
Bazzanella Carla (U. Torino, Italy)
Beigl Michael (TeCO, Germany)
Bell John (U. London, UK)
Benerecetti Massimo
(U. Naples, Italy)
Bermudez Jose Luis
(Washington U. St. Louis, USA)
Bouquet Paolo (U. Trento, Italy)
Brézillon Patrick (U. Paris 6, France)
Budzik Jay (Northwestern U., USA)
Campbell Roy (UIUC, USA)
Canas Alberto (IHMC, USA)
Castefranchi Cristiano (CNR, Italy)
Cavalcanti Marcos
(Fed. U. Rio de Janeiro, Brazil)
Chen Guanling (Dartmouth, USA)
Cheverst Keith (Lancaster U., UK)
Christoff Kalina (Cambridge U., UK)
Conlon Tom (U. of Edinburgh, UK)
Corazza Eros (U. Nottingham, UK)
Coutaz Joelle (INRIA, France)
de Paiva Valeria (Xerox PARC, USA)
de Roure David
(U. Southampton, UK)
Dichev Christo
(Winston-Salem U., USA)
Ebling Maria (IBM, USA)
Edmonds Bruce
(Manchester Inst. Tech., UK)
Fernando Tim
(Trinity College Dublin, Ireland)
Fetzer Anita (U. Stuttgart, Germany)
Finin Tim (UMBC, USA)
French Robert (U. of Liege, Belgium)
Gellersen Hans-Werner
(Lancaster U., UK)
Ghidini Chiara (ITC-irst, Italy)
Giboin Alain (INRIA, France)
Giunchiglia Fausto (U. Trento, Italy)
Goker Mehmet
(PricewaterhouseCoopers, USA)
Gonzalez Avelino
(U. Central Florida, USA)
Graf Peter
(U. British Columbia, Canada)
Grinberg Maurice
(New Bulgarian U., Bulgaria)
Guha Ramanathan
(IBM Research, USA)
Hobbs Jerry (USC/ISI, USA)
Hoffman Robert (IHMC, USA)
Hong Jason (CMU, USA)
Horvitz Eric (Microsoft, USA)
Humphreys Patrick
(London School of Econ. &
Poli. Sci., UK)
Indurkha Bipin
(Tokyo U. of Ag. & Tech., Japan)
Jameson Tony (DKFI, Germany)
Kahana Michael (Brandeis U., USA)
Korta Kepa
(U. the Basque Country, Spain)
LaPalme Guy (U. Montreal, Canada)
Lieberman Henry
(MIT MediaLab, USA)
Mantaras Ramon
(Spanish Sci. Res. Council, Spain)
McClelland James (CMU, USA)
Mostafa Javed (Indiana U., USA)
Nixon Paddy (Strathclyde, UK)
Nossum Rolf (Agder U., Norway)
Pavel Dana (Nokia, USA)
Pimentel Maria
(U. of Sao Paulo, Brazil)
Pu Pearl (EPFL, Switzerland)
Rissland Edwina (NSF, USA)
Roth-Berghofer Thomas
(U. Kaiserslautern, Germany)

Salber Daniel (The Netherlands)
 Schmidt Albrecht
 (U. Munich, Germany)
 Serafini Luciano (ITC, Italy)
 Shafir Eldar (Princeton U., USA)
 Sierra Carles
 (Spanish Sci. Res. Council, Spain)
 Smyth Barry (UCD, Ireland)
 Staab Steffen
 (U. of Karlsruhe, Germany)
 Steenkiste Peter (CMU, USA)
 Stock Oliviero (ITC-IRST, Italy)
 Sowa John
 (VivoMind Intelligence, Inc., USA)

Sumi Yasuyuki (Kyoto U., Japan)
 Ter Meulen Alice
 (U. Groningen, The Netherlands)
 Thomason Rich (U. Michigan, USA)
 Turner Roy (U. Maine, USA)
 Turner Elise (U. Maine, USA)
 van Benthem Johan
 (U. Amsterdam, The Netherlands)
 Wilson David (UNC Charlotte, USA)
 Wilson Deirdre (UCL, UK)
 Winograd Terry (Stanford, USA)
 Young Roger (U. Dundee, UK)

Additional Reviewers

Aihe David (USA)
 Christopoulou Eleni (Greece)
 Gena Cristina (Italy)
 Gerganov Encho (Bulgaria)
 Holleis Paul (Germany)
 Hristova Penka (Bulgaria)
 Joshi Hemant (USA)
 Kranz Matthias (Germany)
 Laine Tei (USA)
 Matsuka Toshihiko (USA)

Merler Stefano (Italy)
 Pleuss Andreas (Germany)
 Reichherzer Thomas (USA)
 Riezler Stefan (USA)
 Rukzio Enrico (Germany)
 Sow Daby (USA)
 Stamenov Maxim (Germany)
 Terrenghi Lucia (Germany)
 Trossen Dirk (USA)
 Van den Bergh Jan (Belgium)

Acknowledgments

We would particularly like to thank the FLAIRS society, and especially Susan Haller, John Kolen and Zdravko Markov for their authorization to use the FLAIRS-04 Website as initial version for the CONTEXT-05 Website.

We also thank Brigitte Bricout, graphic designer at the University of Paris 6 for the realization of the poster of the conference, and A. Jeanne-Michaud for the photos on the poster.

We thank very much Nina Runge and Daphne Batamio for their enthusiastic support during the Web site development from June to September 2004.

We thank finally the volunteers who helped us enthusiastically before, during and after this event.

Sponsoring Institutions

PIERRE ET MARIE CURIE UNIVERSITY

<http://www.upmc.fr/>

PARIS 8 UNIVERSITY

<http://www.univ-paris8.fr/>

COGNITION & USAGES LABORATORY

<http://www.cognition-usages.org/>

LABORATORY OF COMPUTER SCIENCES,

PARIS 6

<http://www.lip6.fr/>

NOKIA

<http://www.nokia.com/>

THE UNIVERSITY OF MAINE

<http://www.umaine.edu/>

ASSOCIATION FRANCAISE POUR LE

CONTEXTE

[http://www-](http://www-poleia.lip6.fr/~brezil/AFC/index.html)

[poleia.lip6.fr/~brezil/AFC/index.html](http://www-poleia.lip6.fr/~brezil/AFC/index.html)

CNRS

<http://www.cnrs.fr/>

AAAI

<http://www.aaai.org/>

RISC

<http://www.risc.cnrs.fr/>

FLAIRS

<http://www.flairs.com/>

SUPÉLEC

<http://www.supelec.fr/>

RITZ

<http://www.ritzparis.com/>

MINISTERE DE L'EDUCATION NATIONALE,
DE L'ENSEIGNEMENT SUPERIEUR ET DE LA

RECHERCHE

<http://www.education.gouv.fr/>



PARIS 8

Cognition



NOKIA
CONNECTING PEOPLE



@fc

Association Française pour le Contexte



Lecture Notes in Artificial Intelligence (LNAI)

- Vol. 3559: P. Auer, R. Meir (Eds.), *Learning Theory*. XI, 692 pages. 2005.
- Vol. 3554: A. Dey, B. Kokinov, D. Leake, R. Turner (Eds.), *Modeling and Using Context*. XIV, 572 pages. 2005.
- Vol. 3533: M. Ali, F. Esposito (Eds.), *Innovations in Applied Artificial Intelligence*. XX, 858 pages. 2005.
- Vol. 3528: P.S. Szczepaniak, J. Kacprzyk, A. Niewiadomski (Eds.), *Advances in Web Intelligence*. XVII, 513 pages. 2005.
- Vol. 3518: T.B. Ho, D. Cheung, H. Liu (Eds.), *Advances in Knowledge Discovery and Data Mining*. XXI, 864 pages. 2005.
- Vol. 3508: P. Bresciani, P. Giorgini, B. Henderson-Sellers, G. Low, M. Winikoff (Eds.), *Agent-Oriented Information Systems II*. X, 227 pages. 2005.
- Vol. 3505: V. Gorodetsky, J. Liu, V.A. Skormin (Eds.), *Autonomous Intelligent Systems: Agents and Data Mining*. XIII, 303 pages. 2005.
- Vol. 3501: B. Kégl, G. Lapalme (Eds.), *Advances in Artificial Intelligence*. XV, 458 pages. 2005.
- Vol. 3492: P. Blache, E. Stabler, J. Busquets, R. Moot (Eds.), *Logical Aspects of Computational Linguistics*. X, 363 pages. 2005.
- Vol. 3488: M.-S. Hacid, N.V. Murray, Z.W. Raś, S. Tsumoto (Eds.), *Foundations of Intelligent Systems*. XIII, 700 pages. 2005.
- Vol. 3476: J. Leite, A. Omicini, P. Torroni, P. Yolum (Eds.), *Declarative Agent Languages and Technologies II*. XII, 289 pages. 2005.
- Vol. 3464: S.A. Brueckner, G.D.M. Serugendo, A. Karageorgos, R. Nagpal (Eds.), *Engineering Self-Organising Systems*. XIII, 299 pages. 2005.
- Vol. 3452: F. Baader, A. Voronkov (Eds.), *Logic for Programming, Artificial Intelligence, and Reasoning*. XI, 562 pages. 2005.
- Vol. 3446: T. Ishida, L. Gasser, H. Nakashima (Eds.), *Massively Multi-Agent Systems I*. XI, 349 pages. 2005.
- Vol. 3438: H. Christiansen, P.R. Skadhauge, J. Villadsen (Eds.), *Constraint Solving and Language Processing*. VIII, 205 pages. 2005.
- Vol. 3430: S. Tsumoto, T. Yamaguchi, M. Numao, H. Motoda (Eds.), *Active Mining*. XII, 349 pages. 2005.
- Vol. 3419: B. Faltings, A. Petcu, F. Fages, F. Rossi (Eds.), *Constraint Satisfaction and Constraint Logic Programming*. X, 217 pages. 2005.
- Vol. 3416: M. Böhlen, J. Gamper, W. Polasek, M.A. Wimmer (Eds.), *E-Government: Towards Electronic Democracy*. XIII, 311 pages. 2005.
- Vol. 3415: P. Davidsson, B. Logan, K. Takadama (Eds.), *Multi-Agent and Multi-Agent-Based Simulation*. X, 265 pages. 2005.
- Vol. 3403: B. Ganter, R. Godin (Eds.), *Formal Concept Analysis*. XI, 419 pages. 2005.
- Vol. 3398: D.-K. Baik (Ed.), *Systems Modeling and Simulation: Theory and Applications*. XIV, 733 pages. 2005.
- Vol. 3397: T.G. Kim (Ed.), *Artificial Intelligence and Simulation*. XV, 711 pages. 2005.
- Vol. 3396: R.M. van Eijk, M.-P. Hugot, F. Dignum (Eds.), *Agent Communication*. X, 261 pages. 2005.
- Vol. 3394: D. Kudenko, D. Kazakov, E. Alonso (Eds.), *Adaptive Agents and Multi-Agent Systems II*. VIII, 313 pages. 2005.
- Vol. 3392: D. Seipel, M. Hanus, U. Geske, O. Bartenstein (Eds.), *Applications of Declarative Programming and Knowledge Management*. X, 309 pages. 2005.
- Vol. 3374: D. Weyns, H.V.D. Parunak, F. Michel (Eds.), *Environments for Multi-Agent Systems*. X, 279 pages. 2005.
- Vol. 3371: M.W. Barley, N. Kasabov (Eds.), *Intelligent Agents and Multi-Agent Systems*. X, 329 pages. 2005.
- Vol. 3369: V.R. Benjamins, P. Casanovas, J. Breuker, A. Gangemi (Eds.), *Law and the Semantic Web*. XII, 249 pages. 2005.
- Vol. 3366: I. Rahwan, P. Moraitis, C. Reed (Eds.), *Argumentation in Multi-Agent Systems*. XII, 263 pages. 2005.
- Vol. 3359: G. Grieser, Y. Tanaka (Eds.), *Intuitive Human Interfaces for Organizing and Accessing Intellectual Assets*. XIV, 257 pages. 2005.
- Vol. 3346: R.H. Bordini, M. Dastani, J. Dix, A.E.F. Seghrouchni (Eds.), *Programming Multi-Agent Systems*. XIV, 249 pages. 2005.
- Vol. 3345: Y. Cai (Ed.), *Ambient Intelligence for Scientific Discovery*. XII, 311 pages. 2005.
- Vol. 3343: C. Freksa, M. Knauff, B. Krieg-Brückner, B. Nebel, T. Barkowsky (Eds.), *Spatial Cognition IV*. XIII, 519 pages. 2005.
- Vol. 3339: G.I. Webb, X. Yu (Eds.), *AI 2004: Advances in Artificial Intelligence*. XXII, 1272 pages. 2004.
- Vol. 3336: D. Karagiannis, U. Reimer (Eds.), *Practical Aspects of Knowledge Management*. X, 523 pages. 2004.
- Vol. 3327: Y. Shi, W. Xu, Z. Chen (Eds.), *Data Mining and Knowledge Management*. XIII, 263 pages. 2005.
- Vol. 3315: C. Lemaître, C.A. Reyes, J.A. González (Eds.), *Advances in Artificial Intelligence – IBERAMIA 2004*. XX, 987 pages. 2004.

- Vol. 3303: J.A. López, E. Benfenati, W. Dubitzky (Eds.), Knowledge Exploration in Life Science Informatics. X, 249 pages. 2004.
- Vol. 3301: G. Kern-Isberner, W. Rödder, F. Kulmann (Eds.), Conditionals, Information, and Inference. XII, 219 pages. 2005.
- Vol. 3276: D. Nardi, M. Riedmiller, C. Sammut, J. Santos-Victor (Eds.), RoboCup 2004: Robot Soccer World Cup VIII. XVIII, 678 pages. 2005.
- Vol. 3275: P. Perner (Ed.), Advances in Data Mining. VIII, 173 pages. 2004.
- Vol. 3265: R.E. Frederking, K.B. Taylor (Eds.), Machine Translation: From Real Users to Research. XI, 392 pages. 2004.
- Vol. 3264: G. Paliouras, Y. Sakakibara (Eds.), Grammatical Inference: Algorithms and Applications. XI, 291 pages. 2004.
- Vol. 3259: J. Dix, J. Leite (Eds.), Computational Logic in Multi-Agent Systems. XII, 251 pages. 2004.
- Vol. 3257: E. Motta, N.R. Shadbolt, A. Stutt, N. Gibbins (Eds.), Engineering Knowledge in the Age of the Semantic Web. XVII, 517 pages. 2004.
- Vol. 3249: B. Buchberger, J.A. Campbell (Eds.), Artificial Intelligence and Symbolic Computation. X, 285 pages. 2004.
- Vol. 3248: K.-Y. Su, J. Tsujii, J.-H. Lee, O.Y. Kwong (Eds.), Natural Language Processing – IJCNLP 2004. XVIII, 817 pages. 2005.
- Vol. 3245: E. Suzuki, S. Arikawa (Eds.), Discovery Science. XIV, 430 pages. 2004.
- Vol. 3244: S. Ben-David, J. Case, A. Maruoka (Eds.), Algorithmic Learning Theory. XIV, 505 pages. 2004.
- Vol. 3238: S. Biundo, T. Frühwirth, G. Palm (Eds.), KI 2004: Advances in Artificial Intelligence. XI, 467 pages. 2004.
- Vol. 3230: J.L. Vicedo, P. Martínez-Barco, R. Muñoz, M. Saiz Noeda (Eds.), Advances in Natural Language Processing. XII, 488 pages. 2004.
- Vol. 3229: J.J. Alferes, J. Leite (Eds.), Logics in Artificial Intelligence. XIV, 744 pages. 2004.
- Vol. 3228: M.G. Hinchey, J.L. Rash, W.F. Truszkowski, C.A. Rouff (Eds.), Formal Approaches to Agent-Based Systems. VIII, 290 pages. 2004.
- Vol. 3215: M.G. Negoita, R.J. Howlett, L.C. Jain (Eds.), Knowledge-Based Intelligent Information and Engineering Systems, Part III. LVII, 906 pages. 2004.
- Vol. 3214: M.G. Negoita, R.J. Howlett, L.C. Jain (Eds.), Knowledge-Based Intelligent Information and Engineering Systems, Part II. LVIII, 1302 pages. 2004.
- Vol. 3213: M.G. Negoita, R.J. Howlett, L.C. Jain (Eds.), Knowledge-Based Intelligent Information and Engineering Systems, Part I. LVIII, 1280 pages. 2004.
- Vol. 3209: B. Berendt, A. Hotho, D. Mladenic, M. van Someren, M. Spiliopoulou, G. Stumme (Eds.), Web Mining: From Web to Semantic Web. IX, 201 pages. 2004.
- Vol. 3206: P. Sojka, I. Kopecek, K. Pala (Eds.), Text, Speech and Dialogue. XIII, 667 pages. 2004.
- Vol. 3202: J.-F. Boulicaut, F. Esposito, F. Giannotti, D. Pedreschi (Eds.), Knowledge Discovery in Databases: PKDD 2004. XIX, 560 pages. 2004.
- Vol. 3201: J.-F. Boulicaut, F. Esposito, F. Giannotti, D. Pedreschi (Eds.), Machine Learning: ECML 2004. XVIII, 580 pages. 2004.
- Vol. 3194: R. Camacho, R. King, A. Srinivasan (Eds.), Inductive Logic Programming. XI, 361 pages. 2004.
- Vol. 3192: C. Bussler, D. Fensel (Eds.), Artificial Intelligence: Methodology, Systems, and Applications. XIII, 522 pages. 2004.
- Vol. 3191: M. Klusch, S. Ossowski, V. Kashyap, R. Unland (Eds.), Cooperative Information Agents VIII. XI, 303 pages. 2004.
- Vol. 3187: G. Lindemann, J. Denzinger, I.J. Timm, R. Unland (Eds.), Multiagent System Technologies. XIII, 341 pages. 2004.
- Vol. 3176: O. Bousquet, U. von Luxburg, G. Rätsch (Eds.), Advanced Lectures on Machine Learning. IX, 241 pages. 2004.
- Vol. 3171: A.L.C. Bazzan, S. Labidi (Eds.), Advances in Artificial Intelligence – SBIA 2004. XVII, 548 pages. 2004.
- Vol. 3159: U. Visser, Intelligent Information Integration for the Semantic Web. XIV, 150 pages. 2004.
- Vol. 3157: C. Zhang, H. W. Guesgen, W.K. Yeap (Eds.), PRICAI 2004: Trends in Artificial Intelligence. XX, 1023 pages. 2004.
- Vol. 3155: P. Funk, P.A. González Calero (Eds.), Advances in Case-Based Reasoning. XIII, 822 pages. 2004.
- Vol. 3139: F. Iida, R. Pfeifer, L. Steels, Y. Kuniyoshi (Eds.), Embodied Artificial Intelligence. IX, 331 pages. 2004.
- Vol. 3131: V. Torra, Y. Narukawa (Eds.), Modeling Decisions for Artificial Intelligence. XI, 327 pages. 2004.
- Vol. 3127: K.E. Wolff, H.D. Pfeiffer, H.S. Delugach (Eds.), Conceptual Structures at Work. XI, 403 pages. 2004.
- Vol. 3123: A. Belz, R. Evans, P. Piwek (Eds.), Natural Language Generation. X, 219 pages. 2004.
- Vol. 3120: J. Shawe-Taylor, Y. Singer (Eds.), Learning Theory. X, 648 pages. 2004.
- Vol. 3097: D. Basin, M. Rusinowitch (Eds.), Automated Reasoning. XII, 493 pages. 2004.
- Vol. 3071: A. Omicini, P. Petta, J. Pitt (Eds.), Engineering Societies in the Agents World. XIII, 409 pages. 2004.
- Vol. 3070: L. Rutkowski, J. Siekmann, R. Tadeusiewicz, L.A. Zadeh (Eds.), Artificial Intelligence and Soft Computing - ICAISC 2004. XXV, 1208 pages. 2004.
- Vol. 3068: E. André, L. Dybkjær, W. Minker, P. Heisterkamp (Eds.), Affective Dialogue Systems. XII, 324 pages. 2004.
- Vol. 3067: M. Dastani, J. Dix, A. El Fallah-Seghrouchni (Eds.), Programming Multi-Agent Systems. X, 221 pages. 2004.
- Vol. 3066: S. Tsumoto, R. Słowiński, J. Komorowski, J.W. Grzymala-Busse (Eds.), Rough Sets and Current Trends in Computing. XX, 853 pages. 2004.
- Vol. 3065: A. Lomuscio, D. Nute (Eds.), Deontic Logic in Computer Science. X, 275 pages. 2004.

¥641.92元

Table of Contents

Modelling the Context of Learning Interactions in Intelligent Learning Environments <i>Fabio N. Akhras</i>	1
Contextual Modals <i>Horacio Arló Costa, William Taysom</i>	15
Understanding Context Before Using It <i>Mary Bazire, Patrick Brézillon</i>	29
Epistemological Contextualism: A Semantic Perspective <i>Claudia Bianchi, Nicla Vassallo</i>	41
Task-Realization Models in Contextual Graphs <i>Patrick Brézillon</i>	55
Context-Dependent and Epistemic Uses of Attention for Perceptual-Demonstrative Identification <i>Nicolas J. Bullot</i>	69
Utilizing Visual Attention for Cross-Modal Coreference Interpretation <i>Donna Byron, Thomas Mampilly, Vinay Sharma, Tianfang Xu</i>	83
Meaning in Context <i>Henning Christiansen, Veronica Dahl</i>	97
Descriptive Naming of Context Data Providers <i>Norman H. Cohen, Paul Castro, Archan Misra</i>	112
Quotations and the Intrusion of Non-linguistic Communication into Utterances <i>Philippe De Brabanter</i>	126
Mobile Phone Talk in Context <i>Mattias Esbjörnsson, Alexandra Weilenmann</i>	140
Unsupervised Clustering of Context Data and Learning User Requirements for a Mobile Device <i>John A. Flanagan</i>	155

Identification of Textual Contexts <i>Ovidiu Fortu, Dan Moldovan</i>	169
Investigation of Context Effects in Iterated Prisoner's Dilemma Game <i>Evgenia Hristova, Maurice Grinberg</i>	183
Context-Aware Configuration: A Study on Improving Cell Phone Awareness <i>Ashraf Khalil, Kay Connelly</i>	197
Context-Aware Adaptation in a Mobile Tour Guide <i>Ronny Kramer, Marko Modsching, Joerg Schulze, Klaus ten Hagen</i>	210
Contextual Factors and Adaptative Multimodal Human-Computer Interaction: Multi-level Specification of Emotion and Expressivity in Embodied Conversational Agents <i>Myriam Lamolle, Maurizio Mancini, Catherine Pelachaud, Sarkis Abrilian, Jean-Claude Martin, Laurence Devillers</i>	225
Modeling Context for Referring in Multimodal Dialogue Systems <i>Frédéric Landragin</i>	240
Exploiting Rich Context: An Incremental Approach to Context-Based Web Search <i>David Leake, Ana Maguitman, Thomas Reichherzer</i>	254
Context Adaptative Self-configuration System Based on Multi-agent <i>Seunghwa Lee, Heeyong Youn, Eunseok Lee</i>	268
Effect of the Task, Visual and Semantic Context on Word Target Detection <i>Laure Léger, Charles Tijus, Thierry Baccino</i>	278
Ontology Facilitated Community Navigation – Who Is Interesting for What I Am Interested in? <i>Nils Malzahn, Sam Zeini, Andreas Harrer</i>	292
Contextual Information Systems <i>Carlos Martín-Vide, Victor Mitrana</i>	304
Context Building Through Socially-Supported Belief <i>Naoko Matsumoto, Akifumi Tokosumi</i>	316
A Quantitative Categorization of Phonemic Dialect Features in Context <i>Naomi Nagy, Xiaoli Zhang, George Nagy, Edgar W. Schneider</i>	326

Context-Oriented Image Retrieval <i>Dympna O'Sullivan, Eoin McLoughlin, Michela Bertolotto, David Wilson</i>	339
An Approach to Data Fusion for Context Awareness <i>Amir Padovitz, Seng W. Loke, Arkady Zaslavsky, Bernard Burg, Claudio Bartolini</i>	353
Dynamic Computation and Context Effects in the Hybrid Architecture AKIRA <i>Giovanni Pezzulo, Gianguglielmo Calvi</i>	368
Goal-Directed Automated Negotiation for Supporting Mobile User Coordination <i>Iyad Rahwan, Fernando Koch, Connor Graham, Anton Kattan, Liz Sonenberg</i>	382
In Defense of Contextual Vocabulary Acquisition – How to Do Things with Words in Context <i>William J. Rapaport</i>	396
Functional Model of Criminality: Simulation Study <i>Sarunas Raudys, Aini Hussain, Viktoras Justickis, Alvydas Pumputis, Arunas Augustinaitis</i>	410
Minimality and Non-determinism in Mutli-context Systems <i>Floris Roelofsen, Luciano Serafini</i>	424
'I' as a Pure Indexical and Metonymy as Language Reduction <i>Esther Romero, Belén Soria</i>	436
Granularity as a Parameter of Context <i>Hedda R. Schmidtke</i>	450
Identifying the Interaction Context in CSCLE <i>Sandra de A. Siebra, Ana Carolina Salgado, Patrícia A. Tedesco, Patrick Brézillon</i>	464
Operational Decision Support: Context-Based Approach and Technological Framework <i>Alexander Smirnov, Michael Pashkin, Nikolai Chilov, Tatiana Levashova</i>	476

Threat Assessment Technology Development <i>Alan N. Steinberg</i>	490
Making Contextual Intensional Logic Nonmonotonic <i>Richmond H. Thomason</i>	501
Modeling Context as Statistical Dependence <i>Sriharsha Veeramachaneni, Prateek Sarkar, George Nagy</i>	515
Robust Utilization of Context in Word Sense Disambiguation <i>Xiaojie Wang</i>	529
Understanding Actions: Contextual Dimensions and Heuristics <i>Elisabetta Zibetti, Charles Tijus</i>	542
Applications of a Context-Management System <i>Andreas Zimmermann, Andreas Lorenz, Marcus Specht</i>	556
Author Index	571

Modelling the Context of Learning Interactions in Intelligent Learning Environments

Fabio N. Akhras

Renato Archer Research Center, Rodovia Dom Pedro I, km 143,6
13082-120 Campinas, São Paulo, Brazil
fabio.akhras@cenpra.gov.br

Abstract. The aim of this paper is to present an approach to modelling and using the context of learning in intelligent learning environments. The approach developed allows the modelling of the content and dynamics of learning situations and the way situations develop as a consequence of interactions. Situation models are used to support two aspects of intelligent learning environments: evaluation of learning, taking into consideration the context of learning activity, and adaptation of the learning environment to the learner's perceived needs, taking into consideration the affordances of learning contexts. The main focus of the paper is on the description of the formalism developed to support context modelling in intelligent learning environments. An application of the approach in a system to support learning of software engineering concepts is briefly described.

1 Introduction

Contemporary theories of learning stress that learning requires the development of active experiences in authentic contexts. According to these theories, learning cannot be separated from activity and an essential part of what is learned is the situation in which learning takes place, which refers to the physical as well as to the social context in which the learner is engaged in activity [1], [2], [3].

The implication of this view to the design of systems to support learning is that the computational learning environments must provide interactive situations for the learner in which the conceptual, physical and social aspects of these contexts are addressed in ways that create possibilities for learning.

Moreover, in order that an intelligent system can reason about the learning experiences developed in a situation, so that it can adapt the learning opportunities to the particular needs of the learner, the characteristics of the situation as well as the information about the interaction developed in the situation must be modelled and explicitly represented in the system.

Therefore, a formalism to represent the context of learning interactions and the interactions that happen in this context is needed. This formalism can inherit some characteristics of formalisms developed to represent context in other artificial intelligence research in which contextual representations are sought for different purposes,