

Lecture Notes in Artificial Intelligence 4798

Edited by J. G. Carbonell and J. Siekmann

Subseries of Lecture Notes in Computer Science

Zili Zhang Jörg Siekmann (Eds.)

Knowledge Science, Engineering and Management

Second International Conference, KSEM 2007
Melbourne, Australia, November 28-30, 2007
Proceedings

Series Editors

Jaime G. Carbonell, Carnegie Mellon University, Pittsburgh, PA, USA
Jörg Siekmann, University of Saarland, Saarbrücken, Germany

Volume Editors

Zili Zhang
Deakin University
School of Engineering and Information Technology
Geelong, VIC 3217, Australia
E-mail: zzhang@deakin.edu.au

Jörg Siekmann
German Research Center of Artificial Intelligence (DFKI), Germany
E-mail: Siekmann@dfki.de

Library of Congress Control Number: Applied for

CR Subject Classification (1998): I.2.6, I.2, H.2.8, H.3-5, F.2.2, K.3

LNCS Sublibrary: SL 7 – Artificial Intelligence

ISSN 0302-9743
ISBN-10 3-540-76718-5 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-76718-3 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

springer.com

© Springer-Verlag Berlin Heidelberg 2007
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 12190126 06/3180 5 4 3 2 1 0

Preface

The second international conference on Knowledge Science, Engineering and Management (KSEM2007) was held in picturesque Melbourne, Australia, during November 28–30 2007, and hosted by Deakin University.

The aim of this interdisciplinary conference is to provide a forum for researchers in the broad areas of knowledge science, knowledge engineering and knowledge management to exchange ideas and to report state-of-the-art research results. Recent years have seen the growing importance of the synergism of knowledge science, engineering and management to provide stronger support for complex problem solving and decision making. KSEM aims at bridging the three areas and promoting their synergism.

KSEM2007 attracted 124 submissions from 21 countries/regions around the world. All submitted papers were reviewed by at least two PC members or external reviewers. The review process was very selective. From the 124 submissions, 42 (33.8%) were accepted as regular papers, and another 28 (22.6%) as short papers. Authors of accepted papers came from 16 countries/regions. This volume of the proceedings contains the abstracts of five invited talks, two of them with extended versions, and all the regular and short papers. The regular papers were categorized into three broad sections, that is, knowledge science, knowledge engineering, and knowledge management.

The technical program featured five invited talks, one panel discussion, and all the accepted papers. The five distinguished invited speakers were John Debenham, Andreas Dengel, Lakhmi Jain, WB Lee, and Ling Zhang.

The success of KSEM2007 was assured by team effort from the sponsors, organizers, reviewers, and participants. We would like to thank the three Area Chairs, Zhi Jin, David Bell, and Eric Tsui, for coordinating and monitoring the whole paper review process. We would like to acknowledge the contribution of the individual Program Committee members and thank the external reviewers. Thanks to Publicity Chair Dongmo Zhang, and Organizing Co-chairs Shang Gao and Shui Yu for their great efforts. Thanks also go to Robert Ruge for maintaining the conference management system. Special thanks to Ruqian Lu, Kate Smith-Miles, and Chengqi Zhang for their valuable advice and suggestions. Our sincere gratitude goes to the participants and all authors of the submitted papers.

We are grateful to our sponsors: Air Force Office of Scientific Research, Asian Office of Aerospace Research and Development (AFOSR/AOARD), (AFOSR/AOARD support is not intended to express or imply endorsement by the U.S. Federal Government.); The School of Engineering and Information Technology and the Faculty of Science and Technology at Deakin University; The Hong Kong Polytechnic University; German Research Center for Artificial Intelligence (DFKI); and Zhuhai Overseas Professional Placement Office Melbourne.

We wish to express our gratitude to the Springer team directed by Alfred Hofmann for their help and cooperation. Thanks to Springer for their special contribution – The Student Best Paper Award at KSEM2007.

November 2007

Zili Zhang
Jörg Siekmann

Organization

KSEM2007 was hosted and organized by the School of Engineering and Information Technology, Deakin University, Australia. The conference was held at Novotel Melbourne on Collins, Melbourne, November 28–30, 2007.

Conference Committee

Conference Co-chairs	Kate Smith-Miles (Deakin University, Australia) Ruqian Lu (Chinese Academy of Sciences, China)
Program Co-chairs	Zili Zhang (Deakin University, Australia/Southwest University, China) Jörg Siekmann (German Research Centre of Artificial Intelligence, Germany)
Area Chairs	Knowledge Science: Zhi Jin (Chinese Academy of Sciences, China) Knowledge Engineering: David Bell (Queen's University Belfast, UK) Knowledge Management: Eric Y.H. Tsui (The Hong Kong Polytechnic University, China)
Organizing Co-chairs	Shang Gao (Deakin University, Australia) Shui Yu (Deakin University, Australia)
Publicity Chair	Dongmo Zhang (University of Western Sydney, Australia)

Program Committee

Klaus-Dieter Althoff (University of Hildesheim, Germany)
Nathalie Aussenac-Gilles (IRIT, CNRS / Paul Sabatier University, France)
Philippe Besnard (IRIT-CNRS, France)
Cungen Cao (Chinese Academy of Sciences, China)
Laurence Cholvy (ONERA Toulouse, France)
Daniel Crabtree (Victoria University of Wellington, New Zealand)
Jim Delgrande (Simon Fraser University, Canada)
Xiaotie Deng (City University of Hong Kong, China)
Kevin C. Desouza (University of Washington, USA)
Rose Dieng-Kuntz (INRIA Sophia Antipolis, France)
Patrick Doherty (Linköping University, Sweden)
Xiaoyong Du (Renmin University of China, China)
Jim Duggan (National University of Ireland, Ireland)
Martin Dzubor (Open University, UK)
Leif Edvinsson (Lund University, Sweden)

Thomas Eiter (Vienna University of Technology (TU Wien), Austria)
Scott E. Fahlman (Carnegie Mellon University, USA)
Xiaoying Gao (Victoria University of Wellington, New Zealand)
Hector Geffner (ICREA and Universitat Pompeu Fabra, Spain)
Lluís Godó (IIIA, Spanish Council for Scientific Research, CSIC, Spain)
Nicola Guarino (ISTC-CNR, Italy)
Gongde Guo (Fujian Normal University, China)
Suliman Hawamdeh (The University of Oklahoma, USA)
Minghua He (Aston University, UK)
Andreas Herzig (IRIT, CNRS / Université Paul Sabatier, France)
Knut Hinkelmann (University of Applied Sciences Northwestern Switzerland)
Jun Hong (Queen's University Belfast, UK)
Zhisheng Huang (Vrije University Amsterdam, The Netherlands)
Anthony Hunter (University College London, UK)
Toru Ishida (Kyoto University, Japan)
David Israel (SRI International, USA)
Gabriele Kern-Isberner (Universität Dortmund, Germany)
John Kidd (Aston Business School, UK)
Patrick Lambe (Straits Knowledge, Singapore)
Jérôme Lang (CNRS / Université Paul Sabatier, France)
Li Li (Swinburne University of Technology, Australia)
Stephen Shaoyi Liao (City University of Hong Kong, China)
Wei Liu (The University of Western Australia, Australia)
Weiru Liu (Queen's University Belfast, UK)
James Lu (Emory University, USA)
Dickson Lukose (MIMOS Bhd., Malaysia)
Xudong Luo (The University of Birmingham, UK)
Michael Madden (National University of Ireland, Ireland)
Simone Marinai (University of Florence, Italy)
Pierre Marquis (Université d'Artois, France)
John-Jules Meyer (Utrecht University, The Netherlands)
Yuan Miao (Victoria University, Australia)
Vibhu Mittal (Google, Inc., USA)
Kenneth Murray (SRI International, USA)
Yoshitero Nakamori (Japan Advanced Institute of Science and Technology, Japan)
Patricia Ordonez de Pablos (The University of Oviedo, Spain)
Ewa Orłowska (Institute of Telecommunications, Poland)
Maurice Pagnucco (University of New South Wales, Australia)
Deepak Ramachandran (University of Illinois at Urbana-Champaign, USA)
Ulrich Reimer (University of Applied Sciences St. Gallen, Switzerland)
Ulrich Remus (University of Canterbury, New Zealand)
Torsten Schaub (Universität Potsdam, Germany)
Choon Ling Sia (City University of Hong Kong, China)
Andrew Skabar (La Trobe University, Australia)
Heiner Stuckenschmidt (Universität Mannheim, Germany)

Kaile Su (Peking University, China)
Jigui Sun (Jilin University, China)
Mirek Truszczyński (University of Kentucky, USA)
Abel Usoro (University of Paisley, UK)
Leon van der Torre (University of Luxembourg, Luxembourg)
Huaqing Wang (City University of Hong Kong, China)
Hui Wang (University of Ulster, UK)
Ju Wang (Guangxi Normal University, China)
Kewen Wang (Griffith University, Australia)
Zhongtuo Wang (Dalian University of Technology, China)
Qingxiang Wu (Queen's University Belfast, UK)
Dongming Xu (University of Queensland, Australia)
Yue Xu (Queensland University of Technology, Australia)
Mingsheng Ying (Tsinghua University, China)
Jia-Huai You (University of Alberta, Canada)
Qingtian Zeng (Shangdong University of Science and Technology, China)
Chunxia Zhang (Beijing Institute of Technology, China)
Mengjie Zhang (Victoria University of Wellington, New Zealand)
Mingyi Zhang (Guizhou Academy of Sciences, China)
Shichao Zhang (Guangxi Normal University, China)
Yan Zhang (University of Western Sydney, Australia)
Aoying Zhou (Fudan University, China)
Xiaofang Zhou (University of Queensland, Australia)
Zhi-Hua Zhou (Nanjing University, China)
Hong Zhu (Fudan University, China)
Zhaohui Zhu (Nanjing University of Aeronautics and Astronautics, China)
Sandra Zilles (University of Alberta, Canada)
Meiyun Zuo (Renmin University of China, China)

External Reviewers

Yukika Awazu	Alexandre Hanft	Gaston Tagni
Kerstin Bach	Aimin Hao	Yisong Wang
Hung Bui	Laura Hollink	Chinthake Wijesooriya
Yixiang Chen	He Hu	Xiao-Bing Xue
Chris Connolly	Linpeng Huang	Kang Ye
Sylvie Coste-Marquis	Philip Hutto	Yao Zhu
Jan-Oliver Deutsch	Grzegorz Majewski	
Laurent Garcia	Régis Newo	

Table of Contents

Invited Talks

Building Relationships and Negotiating Agreements in a Network of Agents (Abstract)	1
<i>John Debenham</i>	
Knowledge Technologies for the Social Semantic Desktop	2
<i>Andreas R. Dengel</i>	
Knowledge-Based Intelligent Engineering Systems in Defence and Security (Abstract)	10
<i>Lakhmi Jain</i>	
Auditing and Mapping the Knowledge Assets of Business Processes – An Empirical Study	11
<i>W.B. Lee, Vivien Shek, and Benny Cheung</i>	
Quotient Space Based Multi-granular Analysis (Abstract)	17
<i>Ling Zhang and Bo Zhang</i>	

Regular Papers

Knowledge Science

An Ontology-Based Reasoning Framework for Reaction Mechanisms Simulation	18
<i>Y.C. Alicia Tang, Sharifuddin Mohd. Zain, Noorsaadah Abdul Rahman, and Rukaini Abdullah</i>	
Identifying Dependency Between Secure Messages for Protocol Analysis	30
<i>Qingfeng Chen, Shichao Zhang, and Yi-Ping Phoebe Chen</i>	
A Diagrammatic Reasoning System for ACC	39
<i>Frithjof Dau and Peter Eklund</i>	
Fuzzy Constraint Logic Programming with Answer Set Semantics	52
<i>Jie Wang and Chunnian Liu</i>	
Prime Implicates for Approximate Reasoning	61
<i>David Rajaratnam and Maurice Pagnucco</i>	
Distributed Constraint Satisfaction for Urban Traffic Signal Control	73
<i>Kazunori Mizuno and Seiichi Nishihara</i>	

Convergence Analysis on Approximate Reinforcement Learning	85
<i>Jinsong Leng, Lakhmi Jain, and Colin Fyfe</i>	
Combinative Reasoning with RCC5 and Cardinal Direction Relations . . .	92
<i>Juan Chen, Dayou Liu, Changhai Zhang, and Qi Xie</i>	
A Merging-Based Approach to Handling Inconsistency in Locally Prioritized Software Requirements	103
<i>Kedian Mu, Weiru Liu, Zhi Jin, Ruqian Lu, Anbu Yue, and David Bell</i>	
A Dynamic Description Logic for Representation and Reasoning About Actions	115
<i>Liang Chang, Fen Lin, and Zhongzhi Shi</i>	
An Argumentative Reasoning Service for Deliberative Agents	128
<i>Alejandro J. García, Nicolás D. Rotstein, Mariano Tucat, and Guillermo R. Simari</i>	
On Defense Strength of Blocking Defeaters in Admissible Sets	140
<i>Diego C. Martínez, Alejandro J. García, and Guillermo R. Simari</i>	
Ontology-Based Inference for Causal Explanation	153
<i>Ph. Besnard, M.-O. Cordier, and Y. Moinard</i>	
Predicting Partners' Behaviors in Negotiation by Using Regression Analysis	165
<i>Fenghui Ren and Minjie Zhang</i>	

Knowledge Engineering

Enhancing Web-Based Adaptive Learning with Colored Timed Petri Net	177
<i>Shang Gao and Robert Dew</i>	
Proof Explanation for the Semantic Web Using Defeasible Logic	186
<i>Grigoris Antoniou, Antonis Bikakis, Nikos Dimareisis, Manolis Genetzakis, Giannis Georgalis, Guido Governatori, Efie Karouzaki, Nikolas Kazepis, Dimitris Kosmadakis, Manolis Kritsotakis, Giannis Lilis, Antonis Papadogiannakis, Panagiotis Pediaditis, Constantinos Terzakis, Rena Theodosaki, and Dimitris Zeginis</i>	
Automatic Construction of a Lexical Attribute Knowledge Base	198
<i>Jinglei Zhao, Yanbo Gao, Hui Liu, and Ruzhan Lu</i>	
Populating CRAB Ontology Using Context-Profile Based Approaches . . .	210
<i>Lian Shi, Jigui Sun, and Haiyan Che</i>	

Learning Dependency Model for AMP-Activated Protein Kinase Regulation	221
<i>Yi-Ping Phoebe Chen, Qiumei Qin, and Qingfeng Chen</i>	
Towards a Wrapper-Driven Ontology-Based Framework for Knowledge Extraction	230
<i>Jigui Sun, Xi Bai, Zehai Li, Haiyan Che, and Huawen Liu</i>	
A Google-Based Statistical Acquisition Model of Chinese Lexical Concepts	243
<i>Jiayu Zhou, Shi Wang, and Cungen Cao</i>	
Learning Concepts from Text Based on the Inner-Constructive Model	255
<i>Shi Wang, Yanan Cao, Xinyu Cao, and Cungen Cao</i>	
Contextual Proximity Based Term-Weighting for Improved Web Information Retrieval	267
<i>M.P.S. Bhatia and Akshi Kumar Khalid</i>	
Collection Profiling for Collection Fusion in Distributed Information Retrieval Systems	279
<i>Chengye Lu, Yue Xu, and Shlomo Geva</i>	
Integration of Descriptors for Software Component Retrieval	289
<i>Yuhanis Yusof and Omer F. Rana</i>	
Framework for Text-Based Conversational User-Interface for Business Applications	301
<i>Shefali Bhat, C. Anantaram, and Hemant Jain</i>	
Ontology Mining for Semantic Interpretation of Information Needs	313
<i>Xiaohui Tao, Yuefeng Li, and Richi Nayak</i>	
Knowledge Flow-Based Document Recommendation for Knowledge Sharing	325
<i>Chin-Hui Lai and Duen-Ren Liu</i>	
Finding Similar RSS News Articles Using Correlation-Based Phrase Matching	336
<i>Maria Soledad Pera and Yiu-Kai Ng</i>	
Automatic Data Record Detection in Web Pages	349
<i>Xiaoying Gao, Le Phong Bao Vuong, and Mengjie Zhang</i>	
Visualizing Trends in Knowledge Management	362
<i>Maria R. Lee and Tsung Teng Chen</i>	

Constructing an Ontology for a Research Program from a Knowledge Science Perspective 372
Jing Tian, Andrzej P. Wierzbicki, Hongtao Ren, and Yoshiteru Nakamori

An Ontology of Problem Frames for Guiding Problem Frame Specification 384
Xiaohong Chen, Zhi Jin, and Lijun Yi

Knowledge Management

A Speaker Based Unsupervised Speech Segmentation Algorithm Used in Conversational Speech 396
Yanxiang Chen and Qiong Wang

Distributed Knowledge Management Based on Ontological Engineering and Multi-Agent System Towards Semantic Interoperation 403
Yonggui Wang, Jiangning Wu, Zhongtuo Wang, and Yanzhong Dang

WTPMiner – Efficient Mining of Weighted Frequent Patterns Based on Graph Traversals 412
Runian Geng, Wenbo Xu, and Xiangjun Dong

Development of Enhanced Data Mining System to Approximate Empirical Formula for Ship Design 425
Kyung Ho Lee, Kyung Su Kim, Jang Hyun Lee, Jong Hoon Park, Dong Geun Kim, and Dae Suk Kim

Research on a Novel Word Co-occurrence Model and Its Application 437
Dequan Zheng, Tiejun Zhao, Sheng Li, and Hao Yu

Cost-Time Sensitive Decision Tree with Missing Values 447
Shichao Zhang, Xiaofeng Zhu, Jilian Zhang, and Chengqi Zhang

Knowledge in Product and Performance Support 460
Rossitza Setchi and Nikolaos Lagos

What Drives Members to Continue Sharing Knowledge in a Virtual Professional Community? The Role of Knowledge Self-efficacy and Satisfaction 472
Christy M.K. Cheung and Matthew K.O. Lee

MMFLDSSW – A New Method to Incrementally Mine Maximal Frequent Itemsets in Transaction Sensitive Sliding Window 485
Jiayin Feng and Jiadong Ren

Short Papers

Term Consistency Checking of Ontology Model Based on Description Logics	496
<i>Changrui Yu and Yan Luo</i>	
Design and Realization of Advertisement Promotion Based on the Content of Webpage	502
<i>Tao Cheng, Shuicai Shi, and Xueqiang Lv</i>	
Irregular Behavior Recognition Based on Two Types of Treading Tracks Under Particular Scenes	508
<i>Ye Zhang, Xiao-Jun Zhang, and Zhi-Jing Liu</i>	
Ontology-Based Focused Crawling of Deep Web Sources	514
<i>Wei Fang, Zhiming Cui, and Pengpeng Zhao</i>	
Pattern Recognition in Stock Data Based on a New Segmentation Algorithm	520
<i>Zhe Zhang, Jian Jiang, Xiaoyan Liu, Wing Chiu Lau, Huaqing Wang, Shanshan Wang, Xinzhu Song, and Dongming Xu</i>	
HMM-Based Korean Named Entity Recognition for Information Extraction	526
<i>Bo-Hyun Yun</i>	
Activity Recognition Based on Hidden Markov Models	532
<i>Weiyao Huang, Jun Zhang, and Zhijing Liu</i>	
Novel Data Management Algorithms in Peer-to-Peer Content Distribution Networks	538
<i>Ke Li, Wanlei Zhou, Shui Yu, and Ping Li</i>	
On-Line Monitoring and Diagnosis of Failures Using Control Charts and Fault Tree Analysis (FTA) Based on Digital Production Model	544
<i>Hui Peng, Wenli Shang, Haibo Shi, and Wei Peng</i>	
An Improved NN-SVM Based on K Congener Nearest Neighbors Classification Algorithm	550
<i>Shirong Zhang, Kuanjiu Zhou, and Yuan Tian</i>	
Handling Contradictions in Default Theories	556
<i>Zhangang Lin and Zuoquan Lin</i>	
Algorithm for Public Transit Trip with Minimal Transfer Times and Shortest Travel Time	562
<i>Gang Hou, Kuanjiu Zhou, and Yang Tian</i>	
Typed Category Theory-Based Micro-view Emergency Knowledge Representation	568
<i>Qingquan Wang and Lili Rong</i>	

A Chinese Time Ontology	575
<i>Chunxia Zhang, Cungen Cao, Yuefei Sui, and Zhendong Niu</i>	
Toward Patterns for Collaborative Knowledge Creation	581
<i>Haoxiang Xia, Zhaoguo Xuan, Taketoshi Yoshida, and Zhongtuo Wang</i>	
Service-Mining Based on Knowledge and Customer Databases	587
<i>Yan Li, Peng Wen, Hu Wang, and Chunqiang Gong</i>	
A Multi-criteria Decision Support System of Water Resource Allocation Scenarios	593
<i>Jing He, Yanchun Zhang, and Yong Shi</i>	
Gödel, Escher, Bach and Super-expertise	599
<i>Pamela N. Gray, Xenogene Gray, and Deborah Richards</i>	
Extracting Features for Verifying WordNet	605
<i>Altangerel Chagnaa, Cheol-Young Ock, and Ho-Seop Choe</i>	
A Hybrid Approach for Learning Markov Equivalence Classes of Bayesian Network	611
<i>Haiyang Jia, Dayou Liu, Juan Chen, and Xin Liu</i>	
A WSMO-Based Semantic Web Services Discovery Framework in Heterogeneous Ontologies Environment	617
<i>Haihua Li, Xiaoyong Du, and Xuan Tian</i>	
Cardinal Direction Relations in 3D Space	623
<i>Juan Chen, Dayou Liu, Haiyang Jia, and Changhai Zhang</i>	
Knowledge Integration on Fresh Food Management	630
<i>Yoshiteru Nakamori, Yukihiro Yamashita, and Mina Ryoke</i>	
An Approach to Knowledge Transferring in Science-Policy Process	636
<i>Mitsumi Miyashita and Yoshiteru Nakamori</i>	
Trust Analysis of Web Services Based on a Trust Ontology	642
<i>Manling Zhu and Zhi Jin</i>	
Building Bilingual Ontology from WordNet and Chinese Classified Thesaurus	649
<i>He Hu and Xiaoyong Du</i>	
An Ontology-Based Framework for Building Adaptable Knowledge Management Systems	655
<i>Yinglin Wang, Jianmei Guo, Tao Hu, and Jie Wang</i>	
Knowledge Engineering Technique for Cluster Development	661
<i>Pradorn Sureephong, Nopasit Chakpitak, Yacine Ouzroute, Gilles Neubert, and Abdelaziz Bouras</i>	
Author Index	667