IFIP Advances in Information and Communication Technology 385

Editor-in-Chief

A. Joe Turner, Seneca, SC, USA

Editorial Board

Foundations of Computer Science
Mike Hinchey, Lero, Limerick, Ireland

Software: Theory and Practice
Michael Goedicke, University of Duisburg-Essen, Germany

Education
Arthur Tatnall, Victoria University, Melbourne, Australia

Information Technology Applications
Ronald Waxman, EDA Standards Consulting, Beachwood, OH, USA

Communication Systems
Guy Leduc, Université de Liège, Belgium

System Modeling and Optimization
Jacques Henry, Université de Bordeaux, France

Information Systems
Jan Pries-Heje, Roskilde University, Denmark

ICT and Society
Jackie Phahlamohlaka, CSIR, Pretoria, South Africa

Computer Systems Technology
Paolo Prinetto, Politecnico di Torino, Italy

Security and Privacy Protection in Information Processing Systems
Kai Rannenberg, Goethe University Frankfurt, Germany

Artificial Intelligence
Tharam Dillon, Curtin University, Bentley, Australia

Human-Computer Interaction
Annelise Mark Pejtersen, Center of Cognitive Systems Engineering, Denmark

Entertainment Computing
Ryohei Nakatsu, National University of Singapore

IFIP – The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within ist member countries and to encourage technology transfer to developing nations. As ist mission statement clearly states,

> *IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.*

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- Open conferences;
- Working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is less rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is in information may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

Zhongzhi Shi David Leake Sunil Vadera (Eds.)

Intelligent Information Processing VI

7th IFIP TC 12 International Conference, IIP 2012
Guilin, China, October 12-15, 2012
Proceedings

Volume Editors

Zhongzhi Shi
Chinese Academy of Sciences
Institute of Computing Technology
Beijing 100190, China
E-mail: shizz@ics.ict.ac.cn

David Leake
Indiana University
Computer Science Department
Bloomington, IN 47405, USA
E-mail: leake@cs.indiana.edu

Sunil Vadera
University of Salford
School of Computing Science and Engineering
Salford M5 4WT, UK
E-mail: s.vadera@salford.ac.uk

ISSN 1868-4238 e-ISSN 1868-422X
ISBN 978-3-642-32890-9 e-ISBN 978-3-642-32891-6
DOI 10.1007/978-3-642-32891-6
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012944898

CR Subject Classification (1998): I.2.3-4, I.2.6, F.4.1, H.2.8, H.3, I.5, F.3.1, C.2, D.2

© IFIP International Federation for Information Processing 2012
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 ist current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.
The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

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

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

This volume comprises the 7th IFIP International Conference on Intelligent Information Processing. As the world proceeds quickly into the Information Age, it encounters both successes and challenges, and it is well recognized today that intelligent information processing provides the key to the Information Age and to mastering many of these challenges. Intelligent information processing supports the most advanced productive tools that are said to be able to change human life and the world itself. However, the path is never a straight one and every new technology brings with it a spate of new research problems to be tackled by researchers; as a result we are not running out of topics, rather the demand is ever increasing. This conference provides a forum for engineers and scientists in academia, university and industry to present their latest research findings in all aspects of intelligent information processing.

This is the 7th IFIP International Conference on Intelligent Information Processing. We received more than 70 papers, of which 39 are included in this program as regular papers and five as short papers. We are grateful for the dedicated work of both the authors and the referees, and we hope these proceedings will continue to bear fruit over the years to come. All papers submitted were reviewed by two referees.

A conference such as this cannot succeed without help from many individuals who contributed their valuable time and expertise. We want to express our sincere gratitude to the Program Committee members and referees, who invested many hours for reviews and deliberations. They provided detailed and constructive review reports that significantly improved the papers included in the program.

We are very grateful to have had the sponsorship of the following organizations: IFIP TC12, Guilin University of Electronic Technology and Institute of Computing Technology, Chinese Academy of Sciences.

Finally, we hope you find this volume inspiring and informative.

August 2012

Zhongzhi Shi
David Leake
Sunil Vadera

Organization

General Chairs

T. Dillon (Australia)
T. Gu (China)
A. Aamodt (Norway)

Program Chairs

Z. Shi (China)
D. Leake (USA)
S. Vadera (UK)

Program Committee

A. Aamodt (Norway)
A. Bernardi (Germany)
N. Bredeche (France)
C. Bryant (UK)
L. Cao (Australia)
E. Chang (Australia)
L. Chang (China)
E. Chen (China)
H. Chen (UK)
F. Coenen (UK)
Z. Cui (China)
S. Dustdar (Austria)
S. Ding (China)
Y. Ding (USA)
Q. Duo (China)
J. Ermine (France)
P. Estraillier (France)
W. Fan (UK)
Y. Gao (China)
L. Hansen (Denmark)
T. Hong (Taiwan)
Q. He (China)
T. Honkela (Finland)
Z. Huang (The Netherlands)
P. Ibarguengoyatia (Mexico)
G. Kayakutlu (Turkey)
D. Leake (USA)
J. Liang (China)
Y. Liang (China)
H. Leung (HK)
S. Matwin (CA)
E. Mercier-Laurent (France)
F. Meziane (UK)
Z. Meng (China)
S. Nefti-Meziani (UK)
T. Nishida (Japan)
G. Osipov (Russia)
M. Owoc (Poland)
A. Rafea (Egypt)
K. Rajkumar (India)
M. Saraee (UK)
F. Segond (France)
Q. Shen (UK)
ZP. Shi (China)
K. Shimohara (Japan)
A. Skowron (Poland)
M. Stumptner (Australia)
E. Succar (Mexico)
H. Tianfield (UK)
IJ. Timm (Germany)
S. Tsumoto (Japan)
G. Wang (China)
S. Vadera (UK)
Y. Xu (Australia)
H. Xiong (USA)
J. Yang (Korea)
Y. Yao (Canada)
J. Yu (China)
J. Zhang (China)
X. Zhao (China)
J. Zhou (China)
Z.-H. Zhou (China)
J. Zucker (France)

Table of Contents

Keynote Presentations

The AI Journey: The Road Traveled and the (Long) Road Ahead (Abstract) 1
Ramon Lopez de Mantaras

Transfer Learning and Applications (Abstract) 2
Qiang Yang

Semantics of Cyber-Physical Systems 3
Tharam Dillon, Elizabeth Chang, Jaipal Singh, and Omar Hussain

Big Data Mining in the Cloud (Abstract) 13
Zhongzhi Shi

Research on Semantic Programming Language (Abstract) 15
Shi Ying

Machine Learning

Effectively Constructing Reliable Data for Cross-Domain Text Classification 16
Fuzhen Zhuang, Qing He, and Zhongzhi Shi

Improving Transfer Learning by Introspective Reasoner 28
Zhongzhi Shi, Bo Zhang, and Fuzhen Zhuang

PPLSA: Parallel Probabilistic Latent Semantic Analysis Based on MapReduce 40
Ning Li, Fuzhen Zhuang, Qing He, and Zhongzhi Shi

Analysis on Limitation Origins of Information Theory 50
Yong Wang, Huadeng Wang, and Qiong Cao

Data Mining

Intelligent Inventory Control: Is Bootstrapping Worth Implementing? . . . 58
Tatpong Katanyukul, Edwin K.P. Chong, and William S. Duff

Support Vector Machine with Mixture of Kernels for Image Classification 68
Dongping Tian, Xiaofei Zhao, and Zhongzhi Shi

The BDIP Software Architecture and Running Mechanism for Self-Organizing MAS 77
Yi Guo, Xinjun Mao, Fu Hou, Cuiyun Hu, and Jianming Zhao

Optimization of Initial Centroids for K-Means Algorithm Based on Small World Network 87
Shimo Shen and Zuqiang Meng

ECCO: A New Evolutionary Classifier with Cost Optimisation 97
Adam Omielan and Sunil Vadera

Automatic Reasoning

Reasoning Theory for D3L with Compositional Bridge Rules 106
Xiaofei Zhao, Dongping Tian, Limin Chen, and Zhongzhi Shi

Semantic Keyword Expansion: A Logical Approach 116
Limin Chen

An ABox Abduction Algorithm for the Description Logic ALCI 125
Yanwei Ma, Tianlong Gu, Binbin Xu, and Liang Chang

Reasoning about Assembly Sequences Based on Description Logic and Rule 131
Yu Meng, Tianlong Gu, and Liang Chang

Semantic Web

Dynamic Logic for the Semantic Web 137
Liang Chang, Qicheng Zhang, Tianlong Gu, and Zhongzhi Shi

On the Support of Ad-Hoc Semantic Web Data Sharing 147
Jing Zhou, Kun Yang, Lei Shi, and Zhongzhi Shi

An Architecture Description Language Based on Dynamic Description Logics 157
Zhuxiao Wang, Hui Peng, Jing Guo, Ying Zhang, Kehe Wu, Huan Xu, and Xiaofeng Wang

Information Retrieval

Query Expansion Based-on Similarity of Terms for Improving Arabic Information Retrieval 167
Khaled Shaalan, Sinan Al-Sheikh, and Farhad Oroumchian

Towards an Author Intention Based Computational Model of Story Generation 177
Feng Zhu and Cungen Cao

Adaptive Algorithm for Interactive Question-Based Search 186
Jacek Rzeniewicz, Julian Szymański, and Włodzisław Duch

Research of Media Material Retrieval Scheme Based on XPath 196
Shuang Feng and Weina Zhang

Construction of SCI Publications Information System for Statistic 202
Xie Wu, Huimin Zhang, and Jingbo Jiang

Knowledge Representation

Symbolic ZBDD Representations for Mechanical Assembly Sequences ... 208
Fengying Li, Tianlong Gu, Guoyong Cai, and Liang Chang

The Representation of Indiscernibility Relation Using ZBDDs 216
Qianjin Wei, Tianlong Gu, Fengying Li, and Guoyong Cai

Symbolic OBDD Assembly Sequence Planning Algorithm Based on Unordered Partition with 2 Parts of a Positive Integer 226
Zhoubo Xu, Tianlong Gu, and Rongsheng Dong

A Representation Model of Geometrical Tolerances Based on First Order Logic 234
Yuchu Qin, Yanru Zhong, Liang Chang, and Meifa Huang

Social Networks

Modeling Group Emotion Based on Emotional Contagion 240
Yanjun Yin, Weiqing Tang, and Weiqing Li

Hierarchical Overlapping Community Discovery Algorithm Based on Node Purity 248
Guoyong Cai, Ruili Wang, and Guobin Liu

Finding Topic-Related Tweets Using Conversational Thread 258
Peng Cao, Shenghua Liu, Jinhua Gao, Huawei Shen, Jingyuan Li, Yue Liu, and Xueqi Cheng

Messages Ranking in Social Network 268
Bo Li, Fengxian Shi, and Enhong Chen

Trust Software

Diagnosis of Internetware Systems Using Dynamic Description Logic ... 276
Kun Yang, Weiqun Cui, Junheng Teng, and Chenzhe Hang

Reasoning about Semantic Web Services with an Approach Based on Temporal Description Logic 286
Juan Wang, Liang Chang, Chuangying Zhu, and Rongsheng Dong

Constraint Programming-Based Virtual Machines Placement Algorithm in Datacenter 295
Yonghong Yu and Yang Gao

Recommendation-Based Trust Model in P2P Network Environment 305
Yueju Lei and Guangxi Chen

Internet of Things

Frequency-Adaptive Cluster Head Election in Wireless Sensor Network 311
Tianlong Yun, Wenjia Niu, Xinghua Yang, Hui Tang, and Song Ci

A Cluster-Based Multilevel Security Model for Wireless Sensor Networks 320
Chao Lee, Lihua Yin, and Yunchuan Guo

A New Security Routing Algorithm Based on MST for Wireless Sensor Network 331
Meimei Zeng and Hua Jiang

Image Processing

A Novel Model for Semantic Learning and Retrieval of Images 337
Zhixin Li, ZhiPing Shi, ZhengJun Tang, and Weizhong Zhao

Automatic Image Annotation and Retrieval Using Hybrid Approach 347
Zhixin Li, Weizhong Zhao, Zhiqing Li, and Zhiping Shi

Double Least Squares Pursuit for Sparse Decomposition 357
Wanyi Li, Peng Wang, and Hong Qiao

Ensemble of k-Labelset Classifiers for Multi-label Image Classification 364
Dapeng Zhang and Xi Liu

Pattern Recognition

Robust Palmprint Recognition Based on Directional Representations . . . 372
Hengjian Li, Lianhai Wang, and Zutao Zhang

FPGA-Based Image Acquisition System Designed for Wireless 382
Haohao Yuan, Jianhe Zhou, and Suqiao Li

A Context-Aware Multi-Agent Systems Architecture for Adaptation of Autonomic Systems 387
Kaiyu Wan and Vasu Alagar

Eyes Closeness Detection Using Appearance Based Methods 398
Xue Liu, Xiaoyang Tan, and Songcan Chen

Author Index 409