

# **Advances in Intelligent Systems and Computing**

Volume 244

*Series Editor*

Janusz Kacprzyk, Warsaw, Poland

For further volumes:

<http://www.springer.com/series/11156>

Van-Nam Huynh · Thierry Denœux  
Dang Hung Tran · Anh Cuong Le  
Son Bao Pham  
Editors

# Knowledge and Systems Engineering

Proceedings of the Fifth International  
Conference KSE 2013, Volume 1

 Springer

*Editors*

Van-Nam Huynh  
School of Knowledge Science  
Japan Advanced Institute of Science  
and Technology  
Ishikawa  
Japan

Anh Cuong Le  
Faculty of Information Technology  
University of Engineering and  
Technology - VNU Hanoi  
Hanoi  
Vietnam

Thierry Denœux  
Universite de Technologie de Compiègne  
Compiègne Cedex  
France

Son Bao Pham  
Faculty of Information Technology  
University of Engineering and  
Technology - VNU Hanoi  
Hanoi  
Vietnam

Dang Hung Tran  
Faculty of Information Technology  
Hanoi National University of Education  
Hanoi  
Vietnam

ISSN 2194-5357

ISSN 2194-5365 (electronic)

ISBN 978-3-319-02740-1

ISBN 978-3-319-02741-8 (eBook)

DOI 10.1007/978-3-319-02741-8

Springer Cham Heidelberg New York Dordrecht London

Library of Congress Control Number: 2013950936

© Springer International Publishing Switzerland 2014

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, 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.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

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

# Preface

This volume contains papers presented at the Fifth International Conference on Knowledge and Systems Engineering (KSE 2013), which was held in Hanoi, Vietnam, during 17–19 October, 2013. The conference was jointly organized by Hanoi National University of Education and the University of Engineering and Technology, Vietnam National University. The principal aim of KSE Conference is to bring together researchers, academics, practitioners and students in order to not only share research results and practical applications but also to foster collaboration in research and education in Knowledge and Systems Engineering.

This year we received a total of 124 submissions. Each of which was peer reviewed by at least two members of the Program Committee. Finally, 68 papers were chosen for presentation at KSE 2013 and publication in the proceedings. Besides the main track, the conference featured six special sessions focusing on specific topics of interest as well as included one workshop, two tutorials and three invited speeches. The kind cooperation of Yasuo Kudo, Tetsuya Murai, Yasunori Endo, Sadaaki Miyamoto, Akira Shimazu, Minh L. Nguyen, Tzung-Pei Hong, Bay Vo, Bac H. Le, Benjamin Quost, Sébastien Destercke, Marie-Hélène Abel, Claude Moulin, Marie-Christine Ho Ba Tho, Sabine Bensamoun, Tien-Tuan Dao, Lam Thu Bui and Tran Dinh Khang in organizing these special sessions and workshop is highly appreciated.

As a follow-up of the Conference, two special issues of the Journal of *Data & Knowledge Engineering* and *International Journal of Approximate Reasoning* will be organized to publish a small number of extended papers selected from the Conference as well as other relevant contributions received in response to subsequent calls. These journal submissions will go through a fresh round of reviews in accordance with the journals' guidelines.

We would like to express our appreciation to all the members of the Program Committee for their support and cooperation in this publication. We would also like to thank Janusz Kacprzyk (Series Editor) and Thomas Ditzinger (Senior Editor, Engineering/Applied Sciences) for their support and cooperation in this publication.

Last, but not the least, we wish to thank all the authors and participants for their contributions and fruitful discussions that made this conference a success.

Hanoi, Vietnam  
October 2013

Van Nam Huynh  
Thierry Dencœux  
Dang Hung Tran  
Anh Cuong Le  
Son Bao Pham

# Organization

## Honorary Chairs

Van Minh Nguyen – Hanoi National University of Education, Vietnam

Ngoc Binh Nguyen – VNU University of Engineering and Technology, Vietnam

## General Chairs

Cam Ha Ho – Hanoi National University of Education, Vietnam

Anh Cuong Le – VNU University of Engineering and Technology, Vietnam

## Program Chairs

Van-Nam Huynh – Japan Advanced Institute of Science and Technology, Japan

Thierry Denœux – Université de Technologie de Compiègne, France

Dang Hung Tran – Hanoi National University of Education, Vietnam

## Program Committee

Akira Shimazu, Japan

Azeddine Beghdadi, France

Son Bao Pham, Vietnam

Benjamin Quost, France

Bernadette Bouchon-Meunier, France

Binh Thanh Huynh, Vietnam

Bay Vo, Vietnam

Cao H, Tru, Vietnam

Churn-Jung Liao, Taiwan

Dinh Dien, Vietnam

Claude Moulin, France

Cuong Nguyen, Vietnam

Dritan Nace, France

Duc Tran, USA

Duc Dung Nguyen, Vietnam

Enrique Herrera-Viedma, Spain

Gabriele Kern-Isberner, Germany

Hiromitsu Hattori, Japan

Hoang Truong, Vietnam

Hung V. Dang, Vietnam

Hung Son Nguyen, Poland

Jean Daniel Zucker, France

Jérôme Lang, France  
Jing Liu, China  
Jiuyong Li, Australia  
Jonathan Lawry, UK  
Kenji Satou, Japan  
Lam T. Bui, Vietnam  
Bac H. Le, Vietnam  
Loannis Parissis, France  
Marie-Helene Abel, France  
Martin Steffen, Norway  
Masahiro Inuiguchi, Japan  
Michel Riveill, France  
Mina Ryoke, Japan  
Minh-Dung Phan, Thailand  
Mitsuru Ikeda, Japan  
Minh L. Nguyen, Japan  
Noboru Takagi, Japan  
Peter Whigham, New Zealand  
Phayung Meesad, Thailand  
Quang-Huy Nguyen, France  
Quang Uy Nguyen, Ireland  
Sabine Bensamoun, France  
Sadaaki Miyamoto, Japan

Serge Stinckwich, France  
Sébastien Destercke, France  
Si Quang Le, UK  
Son Doan, USA  
Tien-Tuan Dao, France  
Tetsuya Murai, Japan  
Thanh Binh Nguyen, Vietnam  
Thanh Tri Nguyen, Vietnam  
Thanh-Thuy Nguyen, Vietnam  
The Duy Bui, Vietnam  
The Loc Nguyen, Vietnam  
Thomas Huynh, USA  
Tho Hoan Pham, Vietnam  
Thepchai Supnithi, Thailand  
The Dung Luong, Vietnam  
Tran Dinh Khang, Vietnam  
Tsutomu Fujinami, Japan  
Tzung-Pei Hong, Taiwan  
Vladik Kreinovich, USA  
Xiaoshan Li, Macau  
Xuan Hoai Nguyen, Vietnam  
Xuan-Hieu Phan, Vietnam  
Yasuo Kudo, Japan

# Contents

## Part I: Keynote Addresses

<b>What Ontological Engineering Can Do for Solving Real-World Problems</b> .....	3
<i>Riichiro Mizoguchi</i>	
<b>Argumentation for Practical Reasoning</b> .....	5
<i>Phan Minh Dung</i>	
<b>Legal Engineering and Its Natural Language Processing</b> .....	7
<i>Akira Shimazu, Minh Le Nguyen</i>	

## Part II: KSE 2013 Main Track

<b>A Hierarchical Approach for High-Quality and Fast Image Completion</b> .....	11
<i>Thanh Trung Dang, Azeddine Beghdadi, Mohamed-Chaker Larabi</i>	
<b>The Un-normalized Graph p-Laplacian Based Semi-supervised Learning Method and Protein Function Prediction Problem</b> .....	23
<i>Loc Tran</i>	
<b>On Horn Knowledge Bases in Regular Description Logic with Inverse</b> .....	37
<i>Linh Anh Nguyen, Thi-Bich-Loc Nguyen, Andrzej Szalas</i>	
<b>On the Semantics of Defeasible Reasoning for Description Logic Ontologies</b> .....	51
<i>Viet-Hoai To, Bac Le, Mitsuru Ikeda</i>	
<b>SudocAD: A Knowledge-Based System for the Author Linkage Problem</b> .....	65
<i>Michel Chein, Michel Leclère, Yann Nicolas</i>	



**Word Confidence Estimation and Its Integration in Sentence Quality Estimation for Machine Translation** . . . . . 85  
*Ngoc-Quang Luong, Laurent Besacier, Benjamin Lecouteux*

**An Improvement of Prosodic Characteristics in Vietnamese Text to Speech System** . . . . . 99  
*Thanh Son Phan, Anh Tuan Dinh, Tat Thang Vu, Chi Mai Luong*

**Text-Independent Phone Segmentation Method Using Gaussian Function** . . . . . 113  
*Dac-Thang Hoang, Hsiao-Chuan Wang*

**New Composition of Intuitionistic Fuzzy Relations** . . . . . 123  
*Bui Cong Cuong, Pham Hong Phong*

**Using Unicode in Encoding the Vietnamese Ethnic Minority Languages, Applying for the Ede Language** . . . . . 137  
*Le Hoang Thi My, Khanh Phan Huy, Souksan Vilavong*

**Improving Moore’s Sentence Alignment Method Using Bilingual Word Clustering** . . . . . 149  
*Hai-Long Trieu, Phuong-Thai Nguyen, Kim-Anh Nguyen*

**Frequent Temporal Inter-object Pattern Mining in Time Series** . . . . . 161  
*Nguyen Thanh Vu, Vo Thi Ngoc Chau*

**iSPLOM: Interactive with Scatterplot Matrix for Exploring Multidimensional Data** . . . . . 175  
*Tran Van Long*

**An Online Monitoring Solution for Complex Distributed Systems Based on Hierarchical Monitoring Agents** . . . . . 187  
*Phuc Tran Nguyen Hong, Son Le Van*

**Incomplete Encryption Based on Multi-channel AES Algorithm to Digital Rights Management** . . . . . 199  
*Ta Minh Thanh, Munetoshi Iwakiri*

**Enhance Matching Web Service Security Policies with Semantic** . . . . . 213  
*Tuan-Dung Cao, Nguyen-Ban Tran*

**An Efficient Method for Discovering Motifs in Streaming Time Series Data** . . . . . 225  
*Cao Duy Truong, Duong Tuan Anh*

**On Discriminant Orientation Extraction Using GridLDA of Line Orientation Maps for Palmprint Identification** . . . . . 237  
*Hoang Thien Van, Thai Hoang Le*

<b>Localization and Velocity Estimation on Bus with Cell-ID</b> . . . . .	249
<i>Hung Nguyen, Tho My Ho, Tien Ba Dinh</i>	
<b>A New Improved Term Weighting Scheme for Text Categorization</b> . . . . .	261
<i>Nguyen Pham Xuan, Hieu Le Quang</i>	
<b>Gender Prediction Using Browsing History</b> . . . . .	271
<i>Do Viet Phuong, Tu Minh Phuong</i>	
<b>News Aggregating System Supporting Semantic Processing Based on Ontology</b> . . . . .	285
<i>Nhon Do Van, Vu Lam Han, Trung Le Bao, Van Ho Long</i>	
<b>Inference of Autism-Related Genes by Integrating Protein-Protein Interactions and miRNA-Target Interactions</b> . . . . .	299
<i>Dang Hung Tran, Thanh-Phuong Nguyen, Laura Caberlotto, Corrado Priami</i>	
<b>Modeling and Verifying Imprecise Requirements of Systems Using Event-B</b> . . . . .	313
<i>Hong Anh Le, Loan Dinh Thi, Ninh Thuan Truong</i>	
<b>Resolution in Linguistic Propositional Logic Based on Linear Symmetrical Hedge Algebra</b> . . . . .	327
<i>Thi-Minh-Tam Nguyen, Viet-Trung Vu, The-Vinh Doan, Duc-Khanh Tran</i>	
<b>A Subgradient Method to Improve Approximation Ratio in the Minimum Latency Problem</b> . . . . .	339
<i>Bang Ban Ha, Nghia Nguyen Duc</i>	
<b>Particulate Matter Concentration Estimation from Satellite Aerosol and Meteorological Parameters: Data-Driven Approaches</b> . . . . .	351
<i>Thi Nhat Thanh Nguyen, Viet Cuong Ta, Thanh Ha Le, Simone Mantovani</i>	
<b>A Spatio-Temporal Profiling Model for Person Identification</b> . . . . .	363
<i>Nghi Pham, Tru Cao</i>	
<b>Secure Authentication for Mobile Devices Based on Acoustic Background Fingerprint</b> . . . . .	375
<i>Quan Quach, Ngu Nguyen, Tien Dinh</i>	
<b>Pomelo's Quality Classification Based on Combination of Color Information and Gabor Filter</b> . . . . .	389
<i>Huu-Hung Huynh, Trong-Nguyen Nguyen, Jean Meunier</i>	
<b>Local Descriptors without Orientation Normalization to Enhance Landmark Recognition</b> . . . . .	401
<i>Dai-Duong Truong, Chau-Sang Nguyen Ngoc, Vinh-Tiep Nguyen, Minh-Triet Tran, Anh-Duc Duong</i>	

**Finding Round-Off Error Using Symbolic Execution** ..... 415  
*Anh-Hoang Truong, Huy-Vu Tran, Bao-Ngoc Nguyen*

**Author Index** ..... 429