

**PROCEEDINGS OF
THE 2015 INTERNATIONAL CONFERENCE ON
INFORMATION & KNOWLEDGE ENGINEERING**

IKE 2015

Editors

**Hamid R. Arabnia
Leonidas Deligiannidis, Ray Hashemi**

Associate Editors

**George Jandieri
Ashu M. G. Solo, Fernando G. Tinetti**



WORLDCOMP'15

July 27-30, 2015

Las Vegas Nevada, USA

www.world-academy-of-science.org

©CSREA Press

This volume contains papers presented at The 2015 International Conference on Information & Knowledge Engineering (IKE'15). Their inclusion in this publication does not necessarily constitute endorsements by editors or by the publisher.

Copyright and Reprint Permission

Copying without a fee is permitted provided that the copies are not made or distributed for direct commercial advantage, and credit to source is given. Abstracting is permitted with credit to the source. Please contact the publisher for other copying, reprint, or republication permission.

Copyright © 2015 CSREA Press
ISBN: 1-60132-422-7
Printed in the United States of America

CSREA Press
U. S. A.

Foreword

It gives us great pleasure to introduce this collection of papers to be presented at the 2015 International Conference on Information & Knowledge Engineering (IKE'15), July 27-30, 2015, at Monte Carlo Resort, Las Vegas, USA.

An important mission of the World Congress in Computer Science, Computer Engineering, and Applied Computing (a federated congress to which this conference is affiliated with) includes *"Providing a unique platform for a diverse community of constituents composed of scholars, researchers, developers, educators, and practitioners. The Congress makes concerted effort to reach out to participants affiliated with diverse entities (such as: universities, institutions, corporations, government agencies, and research centers/labs) from all over the world. The congress also attempts to connect participants from institutions that have **teaching** as their main mission with those who are affiliated with institutions that have **research** as their main mission. The congress uses a quota system to achieve its institution and geography diversity objectives."* By any definition of diversity, this congress is among the most diverse scientific meeting in USA. We are proud to report that this federated congress has authors and participants from 76 different nations representing variety of personal and scientific experiences that arise from differences in culture and values. As can be seen (see below), the program committee of this conference as well as the program committee of all other tracks of the federated congress are as diverse as its authors and participants.

The program committee would like to thank all those who submitted papers for consideration. About 58% of the submissions were from outside the United States. Each submitted paper was peer-reviewed by two experts in the field for originality, significance, clarity, impact, and soundness. In cases of contradictory recommendations, a member of the conference program committee was charged to make the final decision; often, this involved seeking help from additional referees. In addition, papers whose authors included a member of the conference program committee were evaluated using the double-blinded review process. One exception to the above evaluation process was for papers that were submitted directly to chairs/organizers of pre-approved sessions/workshops; in these cases, the chairs/organizers were responsible for the evaluation of such submissions. The overall paper acceptance rate for regular papers was 27%; 7% of the remaining papers were accepted as poster papers (at the time of this writing, we had not yet received the acceptance rate for a few individual tracks.)

We are very grateful to the many colleagues who offered their services in organizing the conference. In particular, we would like to thank the members of the Program Committee of IKE'15, members of the congress Steering Committee, and members of the committees of federated congress tracks that have topics within the scope of IKE. Many individuals listed below, will be requested after the conference to provide their expertise and services for selecting papers for publication (extended versions) in journal special issues as well as for publication in a set of research books (to be prepared for publishers including: Springer, Elsevier, BMC journals, and others).

- *Prof. Afrand Agah; Assistant Chair and Graduate Coordinator, Department of Computer Science, West Chester University of Pennsylvania, West Chester, Pennsylvania, USA*
- *Prof. Abbas M. Al-Bakry (Congress Steering Committee); University President, University of IT and Communications, Baghdad, Iraq*
- *Prof. Nizar Al-Holou (Congress Steering Committee); Professor and Chair, ECE Department; Vice Chair, IEEE/SEM-Computer Chapter; University of Detroit Mercy, Detroit, Michigan, USA*
- *Dr. Hamid Ali Abed Alasadi (Congress Steering Committee); Head, Department of CS, Basra University, Iraq; Member of Optical Society of America (OSA), USA; & SPIE*
- *Prof. Mehran Asadi; Interim Chair, Department of Business and Entrepreneurial Studies, The Lincoln University, Pennsylvania, USA*
- *Prof. Hamid R. Arabnia (Congress Steering Committee & Coordinator); Professor of Computer Science; The University of Georgia, USA; Editor-in-Chief, Journal of Supercomputing (Springer); Editor-in-Chief, Transactions of Computational Science & Computational Intelligence (Springer); Elected Fellow, Int'l Society of Intelligent Biological Medicine (ISIBM); USA*
- *Prof. Juan Jose Martinez Castillo; Director, The Acantelys Alan Turing Nikola Tesla Research Group and GIPEB, Universidad Nacional Abierta, Venezuela*

- *Prof. Kevin Daimi (Congress Steering Committee); Director, Computer Science and Software Engineering Programs, Department of Math, CS & Software Eng., University of Detroit Mercy, Detroit, Michigan, USA*
- *Prof. Leonidas Deligiannidis (IKE'15 Session Chair & Co-Editor); Department of Computer Information Systems, Wentworth Institute of Technology, Boston, Massachusetts, USA*
- *Prof. Mary Mehrnoosh Eshaghian-Wilner (Congress Steering Committee); Professor of Engineering Practice, University of Southern California, California, USA; Adjunct Professor, Electrical Engineering, University of California Los Angeles, Los Angeles (UCLA), California, USA*
- *Prof. Jinan Fiaidhi; Department of Computer Science, Lakehead University, Ontario, Canada*
- *Prof. George A. Gravvanis (Congress Steering Committee); Director, Physics Laboratory & Head of Advanced Scientific Computing, Applied Math & Applications Research Group; Professor of Applied Mathematics and Numerical Computing and Department of ECE, School of Engineering, Democritus University of Thrace, Xanthi, Greece*
- *Prof. Ray Hashemi (IKE'15 Session Chair & Co-Editor); Professor of Computer Science and Information Technology, Armstrong Atlantic State University, Savannah, Georgia, USA*
- *Prof. Houcine Hassan; Universitat Politècnica de Valencia, Spain*
- *Prof. George Jandieri (Congress Steering Committee); Georgian Technical University, Tbilisi, Georgia; Chief Scientist, The Institute of Cybernetics, Georgian Academy of Science, Georgia; Editorial Board Member: International Journal of Microwaves and Optical Technology, The Open Atmospheric Science Journal, American Journal of Remote Sensing*
- *Dr. Abdeldjalil Khelassi; Head of Knowledge and Information Engineering Research Team, Computer Science Department, University of Tlemcen, Algeria*
- *Dr. Cartik Kothari; Biomedical Informatics Center, Harvard Medical School, Boston, Massachusetts, USA*
- *Prof. Dr. B. Raja Sarath Kumar (ICAI'15); Professor and Principal, Lenora College of Engineering, Visakhapatnam, Andhra Pradesh, India*
- *Dr. Yan Luo; National Institutes of Health, Bethesda, Maryland, USA*
- *Dr. Andrew Marsh (Congress Steering Committee); CEO, HoIP Telecom Ltd (Healthcare over Internet Protocol), UK; Secretary General of World Academy of BioMedical Sciences and Technologies (WABT) a UNESCO NGO, The United Nations*
- *Dr. Hadeel Kareem Al Obaidy; College of Information Technology College - Department of Computer Science, University of Bahrain, Kingdom of Bahrain*
- *Prof. G. N. Pandey (Congress Steering Committee); Vice-Chancellor, Arunachal University of Studies, Arunachal Pradesh, India; Adjunct Professor, Indian Institute of Information Technology, Allahabad, India*
- *Dr. Vijay Bhaskar Semwal; Department of Robotics & Artificial Intelligence, Indian Institute of Information Technology (IIT), Allahabad, India*
- *Dr. Akash Singh (Congress Steering Committee); IBM Corporation, Sacramento, California, USA; Chartered Scientist, Science Council, UK; Fellow, British Computer Society; Member, Senior IEEE, AACR, AAAS, and AAAI; IBM Corporation, USA*
- *Ashu M. G. Solo, (Publicity Chair), Fellow of British Computer Society, Principal/R&D Engineer, Maverick Technologies America Inc.*
- *Prof. Fernando G. Tinetti (Congress Steering Committee); School of Computer Science, Universidad Nacional de La Plata, La Plata, Argentina; Co-editor, Journal of Computer Science & Technology (JCS&T)*
- *Prof. Shiiuh-Jeng Wang (Congress Steering Committee); Department of Information Management, Central Police University, Taiwan; Program Chair, Security & Forensics, Taiwan; Director, Information Crypto and Construction Lab (ICCL) & ICCL-FROG*
- *Prof. Mary Q. Yang (Congress Steering Committee); Director, Mid-South Bioinformatics Center and Joint Bioinformatics Ph.D. Program, Medical Sciences and George W. Donaghey College of Engineering and Information Technology, University of Arkansas, USA*
- *Prof. Jane You (Congress Steering Committee); Associate Head, Department of Computing, The Hong Kong Polytechnic University, Kowloon, Hong Kong*
- *Dr. Ismail Yusuf (ICAI'15); Department of Artificial Intelligence, Faculty of Computer Science and Information Technology, University of Malaya, Malaysia; and Lamintang Education and Training (LET) Centre, Perum Bandara Mas, Batam, Indonesia*

We would like to extend our appreciation to the members of the program committees of individual sessions, tracks, and workshops; their names do not appear in this document; they are listed on the web sites of individual tracks.

As Sponsors-at-large, partners, and/or organizers each of the followings (separated by semicolons) provided help for at least one track of the World Congress: Computer Science Research, Education, and Applications Press (CSREA); US Chapter of World Academy of Science (<http://www.world-academy-of->

science.org/); American Council on Science & Education & Federated Research Council (<http://www.americancse.org/>); HoIP, Health Without Boundaries, Healthcare over Internet Protocol, UK (<http://www.hoip.eu>); HoIP Telecom, UK (<http://www.hoip-telecom.co.uk>); and WABT, Human Health Medicine, UNESCO NGOs, Paris, France (<http://www.thewabt.com/>). In addition, a number of university faculty members and their staff (names appear on the cover of the set of proceedings), several publishers of computer science and computer engineering books and journals, chapters and/or task forces of computer science associations/organizations from 4 countries, and developers of high-performance machines and systems provided significant help in organizing the conference as well as providing some resources. We are grateful to them all.

We express our gratitude to keynote, invited, and individual conference/tracks and tutorial speakers - the list of speakers appears on the conference web site. We would also like to thank the followings: UCMSS (Universal Conference Management Systems & Support, California, USA) for managing all aspects of the conference; Dr. Tim Field of APC for coordinating and managing the printing of the proceedings; and the staff of Monte Carlo Resort (Convention department) in Las Vegas for the professional service they provided. Last but not least, we would like to thank the Co-Editors and Associate Co-Editors of IKE'15: Prof. Hamid R. Arabnia, Prof. Leonidas Deligiannidis, Prof. Ray Hashemi, Prof. George Jandieri, Ashu M. G. Solo, and Prof. Fernando G. Tinetti.

We present the proceedings of IKE'15.

Steering Committee, 2015

<http://www.world-academy-of-science.org/>

Contents

SESSION: INFORMATION AND KNOWLEDGE EXTRACTION, REPRESENTATION AND SHARING

- Applying a Semantic and Syntactic Comparisons Based Automatic Model Transformation Methodology to Serve Information Sharing** 3

Tiexin Wang, Sebastien Truptil, Frederick Benanben

- Knowledge Representation: Conceptual Graphs vs. Flow-Based Modeling** 10

Sabah Al-Fedaghi

- A Hybrid Approach to Extract and Classify Relation from Biomedical Text** 17

Abdul Wahab Muzaffar, Farooque Azam, Usman Qamar, Shumyla Rasheed Mir, Muhammad Latif

- Real-Time Motion Detection Using Low-Resolution Web Cams** 24

Mark Smith

- Market Research of the Innovative Smelling Smartphone** 29

Raed Al-Wishah

SESSION: BIG DATA ANALYTICS + DATA WAREHOUSE DESIGN + SOCIAL MEDIA + BUSINESS INTELLIGENCE AND KNOWLEDGE DISCOVERY + RECOMMENDER SYSTEMS

- Supporting Crowd-funded Agile Software Development Projects using Contingent Working: Exploring Big Data from Participatory Design Documentation and Interviews** 43

Jonathan Bishop

- Data Warehouse Design Using Row and Column Data Distribution** 55

Behrooz Seyed-Abbassi, Vivekanand Madesi

- The Effect of Neighbor Selection in Collaborative Filtering Systems** 62

Soojung Lee

- Multidimensional Analysis Using Knowledge Layer For Effective Decision Making** 66

Ayaz Mahmood, Sohail Asghar

- Identifying Common Individual Identities across Various Social Media Sources through Analytics** 75

Gurpreet Bawa

**SESSION: KNOWLEDGE ENGINEERING AND INFORMATION FUSION +
KNOWLEDGE DISCOVERY + SEMANTIC WEB + DATA MINING**

Stochastic and Chaotic Calculus Methods for Detection of Multi-Agile Threat Emitters 83
James Crowder

A Semantic Knowledge Discovery Strategy for Translational Research 90
Cartik R Kothari Saravanamuthu

Condensation of Reverse Engineered UML Diagrams by Using the Semantic Web Technologies 95
Meisam Booshehri, Peter Luksch

Determinants of Plasma Beta-Carotene Levels using Neurofuzzy System and Multivariate Analyses 100
Deok Hee Nam

A Scalable Strategy for Mining Association Rules under Grids 106
Raja Tlili, Khaoula ElBedoui, Yahya Slimani

**SESSION: FEATURE EXTRACTION AND RELATED ALGORITHMS +
INFORMATION RETRIEVAL and ONTOLOGY BASED METHODS**

ODISEES: Ontology-driven Interactive Search Environment for Earth Sciences 115
Matthew Rutherford, Elisabeth Huffer, John Kusterer, Brandi Quam

Index Optimization with KNN considering Similarities among Features 120
Taeho Jo

Classification based Filtering for Personalized Information Retrieval 125
Sachintha Pitigala, Cen Li

Computing the Semantic Distance Between Terms: An Ontology-Based Approach 132
Alicia Martinez, Fernando Pech, Noe Castro, Dante Mujica, Hugo Estrada, Ilse Caspeta

**SESSION: INFRASTRUCTURES + APPLICATIONS OF INFORMATION AND
KNOWLEDGE ENGINEERING + LEGISLATION AND INTELLECTUAL
PROPERTY DISCUSSIONS**

Wind Power Generation Prediction On A Large Real Life Dataset 141
Roshil Paudyal, Mugizi Rwebangira, Mandoye Ndoye

The Impact of Uncertainty Measures in the Cardiac Arrhythmia Detection Supported by IK-DCBRC 144
Abdeldjalil Khelassi

Extraction of Significant Lexical Associations to Classify the Essential Perspectives for Text Summarization 150

Nasrin Asadi, Kambiz Badie, Maryam Tayefeh Mahmoudi, Naeimeh Sahabi

Post-Mayo/Biosig/Alice - The Precise Meanings of their New SPL Terms 156

Sigram Schindler, Bernd Wegner, Juergen Schulze, Doerte Schoenberg

Kids Friendly Factor in Urban Spaces 168

Anahita Mohammadi, Ali Jabbari Jahromi, Azadeh Alighanbari

SESSION: SECURITY, PRIVACY AND RELATED METHODS + IDENTITY MANAGEMENT METHODS

Multi-Participant Encryption-Steganography Technique 175

Hamdy Mohamed Mousa Mostafa

Design Consideration for Client Synchronization Methods in an Identity Resolution Service 181

Fumiko Kobayashi, John Talburt

Applying Phonetic Hash Functions to Improve Record Linking in Student Enrollment Data 187

Pei Wang, Daniel Pullen, John Talburt, Ningning Wu

SESSION: LATE BREAKING PAPERS: SMART CITY ECOSYSTEMS, UNL, AND ENVIRONMENTAL ISSUES

Lifecycle Based Modeling of Smart City Ecosystem 195

Ahmed Hefnawy, Abdelaziz Bouras, Chantal Cherifi

Formation of Word Dictionary of Bangla Vowel Ended Roots for First Person for Universal Networking Language 201

Md. Nawab Yousuf Ali, Golam Sorwar, Md Shamsujjoha

Analyzing the Role of Child Friendly Environments in Continuation of Sustainable Urban Development. Employing the Sense of Positive Thinking Approach 207

Mohammad Mehdi Khabiri, Amir Reza Khabiri Khatiri

