Studies in Computational Intelligence

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Series editor

Janusz Kacprzyk, Polish Academy of Sciences, Warsaw, Poland
e-mail: kacprzyk@ibspan.waw.pl

About this Series

The series "Studies in Computational Intelligence" (SCI) publishes new developments and advances in the various areas of computational intelligence—quickly and with a high quality. The intent is to cover the theory, applications, and design methods of computational intelligence, as embedded in the fields of engineering, computer science, physics and life sciences, as well as the methodologies behind them. The series contains monographs, lecture notes and edited volumes in computational intelligence spanning the areas of neural networks, connectionist systems, genetic algorithms, evolutionary computation, artificial intelligence, cellular automata, self-organizing systems, soft computing, fuzzy systems, and hybrid intelligent systems. Of particular value to both the contributors and the readership are the short publication timeframe and the worldwide distribution, which enable both wide and rapid dissemination of research output.

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Foreword

The purpose of the 14th IEEE/ACIS International Conference on Computer and Information Science (ICIS 2015) held on June 28–July 1, 2015 in Las Vegas, USA, was to bring together researchers, scientists, engineers, industry practitioners, and students to discuss, encourage, and exchange new ideas, research results, and experiences on all aspects of Applied Computers & Information Technology, and to discuss the practical challenges encountered along the way and the solutions adopted to solve them. The conference organizers have selected the best 16 papers from those papers accepted for presentation at the conference in order to publish them in this volume. The papers were chosen based on review scores submitted by members of the program committee and consequently underwent further rigorous rounds of review.

In "*SAF*: States Aware Fully Associative FTL for Multitasking Environment", Usman Anwar, Se Jin Kwon, and Tae-Sun Chung propose a new FTL algorithm called SAF. Compared to the previous FTL algorithm, SAF shows higher performance. They also provide performance comparison results of their implementation of SAF and previous algorithm FAST.

In "Security Measures for Web ETL Processes", Salma Dammak, Faiza Ghozzi Jedidi, and Faiez Gargouri present a Common Vulnerability Scoring System (CVSS) and proposes a Meta model for security measure in Web ETL processes enabling security manager to asset anticipated vulnerabilities.

In "Automated Negotiating Agent Based on Evolutionary Stable Strategies", Akiyuki Mori and Takayuki Ito propose a negotiating agent that is based on the expected utility value at the equilibrium point of an evolutionary stable strategy (ESS).

In "Architecture for Intelligent Transportation System Based in a General Traffic Ontology", Susel Fernandez, Takayuki Ito, and Rafik Hadfi introduce an ontology-based system to provide roadside assistance, providing drivers making decisions in different situations, taking into account information on different traffic-related elements such as routes, traffic signs, traffic regulations, and weather elements.

In "Optimization of Cross-Lingual LSI Training Data", John Pozniak and Roger Bradford present a principled approach for making such selection. We present test results for the technique for cross-lingual document similarity comparison. The results demonstrate that, at least for this use case, employment of the technique can have a dramatic beneficial effect on LSI performance.

In "Depth-First Heuristic Search for Software Model Checking", Jun Maeoka, Yoshinori Tanabe, and Fuyuki Ishikawa propose an algorithm called depth-first heuristic search (DFHS), which performs depth-first search but backtracks at states that unlikely lead to an error. Experimental results show that DFHS performs better than current algorithms for both safety and LTL properties of programs in many cases.

In "A Novel Architecture for Learner's Profiles Interoperability", Leila Ghorbel, Corinne Amel Zayani, and Ikram Amous propose a novel interoperable architecture allowing the exchange of the learner's profile information between different adaptive educational cross-systems to provide an access corresponding to the learners' needs.

In "CORE: Continuous Monitoring of Reverse *k* Nearest Neighbors on Moving Objects in Road Networks", Muhammad Attique, Hyung-Ju Cho, and Tae-Sun Chung present a new safe exit based algorithm for efficiently computing safe exit points of query and data objects for continuous reverse nearest neighbor queries called CORE.

In "A Voice Dialog Editor Based on Finite State Transducer Using Composite State for Tablet Devices", Keitaro Wakabayashi, Daisuke Yamamoto, and Naohisa Takahashi propose a method of editing voice interaction contents using composite state. The results of experiments conducted indicate that this objective was achieved.

In "Analysis of Driving Behaviors Based on GMM by Using Driving Simulator with Navigation Plugin", Naoto Mukai aims for modeling driving behaviors to support operation of novice drivers. Moreover, they examine the effects of navigation at the roundabout intersection for the novice drivers.

In "Bin-Based Estimation of the Amount of Effort for Embedded Software Development Projects with Support Vector Machines", Kazunori Iwata and Elad Liebman, Peter Stone, Toyoshiro Nakashima, Yoshiyuki Anan, and Naohiro Ishii study a bin-based estimation method of the amount of effort associated with code development. They carry out evaluation experiments to compare the accuracy of the proposed SVM models with that of the e-SVR using Welch's t-test and effect sizes.

In "Applying RoBuSt Method for Robustness Testing of the Non-interference Property", Maha Naceur and Lilia Sfaxi propose to apply an approach they developed in a previous work to test the robustness of a very restrictive and important security property, which is non-interference.

In "An Improved Multi-SOM Algorithm for Determining the Optimal Number of Clusters", Imèn Khanchouch, Malika Charrad, and Mohamed Limam focus on multi-SOM clustering approach which overcomes the problem of extracting the number of clusters from the SOM map through the use of a clustering validity index.

In "Conformance Testing for Timed Recursive Programs", Hana M'Hemdi, Jacques Julliand, Pierre-Alain Masson, and Riadh Robbana propose a novel method of offline test generation from deterministic TPAIO. This paper is about conformance testing of timed pushdown automata with inputs and outputs (TPAIO), which specify both stack and clock constraints.

In "Instruction Level Loop De-optimization: Loop Rerolling and Software De-pipelining", Erh-Wen Hu, Bogong Su, and Jian Wang report their work on loop de-optimization at instruction level. They demonstrated their approach with a practical working example and carried out experiments on TIC6x, a digital signal processor with a compiler supporting instruction-level parallelism.

In "ETL Design Toward Social Network Opinion Analysis", Afef Walha, Faiza Ghozzi, and Faïez Gargouri propose an ETL design approach integrating user's opinion analysis, expressed on the popular social network Facebook. It consists of the extraction of opinion data on Facebook pages (e.g., comments), its pre-processing, sentiment analysis and classification, and reformatting and loading into the Data WeBhouse (DWB).

It is our sincere hope that this volume provides stimulation and inspiration, and that it will be used as a foundation for works to come.

Shizuoka University, Japan Naoki Fukuta
June 2015

Contents

Contributors

Ikram Amous MIRACL-ISIMS Sfax University, Sfax, Tunisia

Yoshiyuki Anan Base Division, Omron Software Co., Ltd., Shimogyo-ku, Kyoto, Japan

Usman Anwar Computer Engineering, Ajou University, Suwon, South Korea

Muhammad Attique Department of Computer Engineering, Ajou University, Suwon, South Korea

Roger Bradford Maxim Analytics, Reston, VA, USA

Malika Charrad Department of Computer Science, RIADI lab, University of Gabès, Gabès, Tunisia; MSDMA Team, Cedric, CNAM, Paris, France

Hyung-Ju Cho Department of Software, Kyungpook National University, Gajang-dong, Sangju-si, Gyeongsangbuk-do, South Korea

Tae-Sun Chung Department of Computer Engineering, Ajou University, Suwon, South Korea

Salma Dammak MIRACL-ISIMS Pole technologique de SFAX BP 242-3021, Sakiet Ezzit Sfax, Sfax, Tunisia

Susel Fernandez University of Alcala. Alcalá de Henares, Madrid, Spain

Faïez Gargouri Institute of Computer Science and Multimedia, University of Sfax, Sfax, Tunisia

Leila Ghorbel MIRACL-ISIMS Sfax University, Sfax, Tunisia

Faiza Ghozzi Institute of Computer Science and Multimedia, University of Sfax, Sfax, Tunisia

Rafik Hadfi Nagoya Institute of Technology, Nagoya, Japan

Erh-Wen Hu Department of Computer Science, William Paterson University, Wayne, NJ, USA

Naohiro Ishii Department of Information Science, Aichi Institute of Technology, Yakusa-cho, Toyota, Aichi, Japan

Fuyuki Ishikawa The University of Electro-Communications, Chofu-shi, Tokyo, Japan; National Institute of Informatics, Chiyoda-ku, Tokyo, Japan

Takayuki Ito Nagoya Institute of Technology, Nagoya, Japan

Kazunori Iwata Department of Business Administration, Aichi University, Nakamura-ku, Nagoya, Aichi, Japan; Department of Computer Science, The University of Texas at Austin, Austin, TX, USA

Faiza Ghozzi Jedidi MIRACL-ISIMS Pole technologique de SFAX BP 242-3021, Sakiet Ezzit Sfax, Sfax, Tunisia

Jacques Julliand FEMTO-ST/DISC, University of Franche-Comté, Besançon, France

Imèn Khanchouch Department of Computer Science, University of Tunis, ISG, Tunis, Tunisia

Se Jin Kwon Computer Engineering, Ajou University, Suwon, South Korea

Elad Liebman Department of Computer Science, The University of Texas at Austin, Austin, TX, USA

Mohamed Limam Department of Computer Science, University of Tunis, ISG, Tunis, Tunisia; Department of Statistics, Dhofar University, Salalah, Oman

Jun Maeoka Research and Development Group, Hitachi, Ltd., Yokohama-shi, Kanagawa, Japan; The University of Electro-Communications, Chofu-shi, Tokyo, Japan

Pierre-Alain Masson FEMTO-ST/DISC, University of Franche-Comté, Besançon, France

Hana M'Hemdi FEMTO-ST/DISC, University of Franche-Comté, Besançon, France; LIP2, University of Tunis El Manar, Tunis, Tunisia

Akiyuki Mori Nagoya Institute of Technology, Aichi, Japan

Naoto Mukai Department of Culture-Information Studies, School of Culture-Information Studies, Sugiyama Jogakuen University, Aichi, Japan

Maha Naceur LIP 2 Laboratory, University of Tunis El Manar, Tunis, Tunisia

Toyoshiro Nakashima Department of Culture-Information Studies, Sugiyama Jogakuen University, Chikusa-ku, Nagoya, Aichi, Japan

John Pozniak Leidos, Chantilly, VA, USA

Riadh Robbana LIP2 and INSAT-University of Carthage, Tunis, Tunisia

Lilia Sfaxi LIP 2 Laboratory, University of Tunis El Manar, INSAT, University of Carthage, Tunis, Tunisia

Peter Stone Department of Computer Science, The University of Texas at Austin, Austin, TX, USA

Bogong Su Department of Computer Science, William Paterson University, Wayne, NJ, USA

Naohisa Takahashi Nagoya Institute of Technology, Nagoya-shi, Aichi, Japan

Yoshinori Tanabe Tsurumi University, Yokohama-shi, Kanagawa, Japan

Keitaro Wakabayashi Nagoya Institute of Technology, Nagoya-shi, Aichi, Japan

Afef Walha Multimedia, Information systems and Advanced Computing Laboratory, University of Sfax, Sfax, Tunisia

Jian Wang Mobile Broadband Software Design, Ericsson, Ottawa, ON, Canada

Daisuke Yamamoto Nagoya Institute of Technology, Nagoya-shi, Aichi, Japan

Corinne Amel Zayani MIRACL-ISIMS Sfax University, Sfax, Tunisia