Guest Editorial Preface

Special Issue on Big Data Applications

J. Octavio Gutierrez-Garcia, Department of Computer Science, Instituto Tecnológico Autónomo de México, Mexico City, Mexico

Víctor M. González, Department of Computer Science, Instituto Tecnológico Autónomo de México, Mexico City, Mexico

Patrick C. K. Hung, Faculty of Business and Information Technology, University of Ontario Institute of Technology, Oshawa, Canada

The exponential growth of data generated by society and the emergence of ubiquitous data collection systems have led to an opportunity to transform data into insights for unparalleled decision-making giving rise to the age of Big Data. It is within this context that the Mexico City Satellite Session of the IEEE Big Data CONGRESS was held on May 8, 2014 in Mexico. In the satellite session, both practitioners and researchers were brought together to discuss novel big data applications and use cases.

This special issue of the International Journal of Web Services Research includes three extended versions of articles presented at the Mexico City Satellite Session of the IEEE BigData CONGRESS 2014. In addition, this special issue also includes (1) an invited, but peer-reviewed article and (2) a regular paper recommended by the editorial board.

- The first article, by Kuri-Morales, is entitled "Minimum Data Base Determination using Machine Learning". This article proposes a methodology to analyze considerably large databases by obtaining an equally representative data subset using entropy theory and machine learning techniques. The methodology has been validated by means of real-world case studies involving millions of records composed of more than one hundred variables.
- García Ríos and Incera Diéguez contribute an article entitled "A Big Data Testbed for Analyzing Data Generated by an Air Pollution Sensor Network". The authors propose a framework for collection, management and exploitation of real-time data generated by large-scale wireless sensor networks. The novelty of the framework lies on the effective combination of Big Data technologies and stream computing tools applied to an air pollution sensor network.
- The third contribution, by Quezada-Naquid, Marcelín-Jiménez and González-Compeán, has the title "Babel: The Construction of a Massive Storage System". This article proposes the Babel file system, a middleware capable of supporting a data storage system composed of commodity storage nodes, which can be used as building blocks for implementing flexible client applications. The authors provide empirical evidence to demonstrate that Babel is fault-tolerant and scalable.
- The fourth article is entitled "Understanding Human Behavior in Urban Spaces using Social Network Data: a mobility graph approach" by Martínez, Escalante, Beguerisse-Díaz, Garduño and González. In this article, a mobility graph of Mexico City was constructed from twitter data by means of clustering algorithms and a spatiotemporal analysis. The authors' results provide insightful information for urban planning and transportation decision-making in Mexico City.

- Finally, the fifth article, by Chen, Xu, and Ni is entitled "A Study on Online Social Networks Theme Semantic Computing Model". This article proposes (1) a numerical model of text semantic analysis based on artificial neural networks, (2) a semantic computational algorithm for social network texts, and (3) a theme discovery algorithm.

ACKNOWLEDGMENT

J. Octavio Gutierrez-Garcia received his PhD in Electrical Engineering and Computer Science from CINVESTAV and Grenoble Institute of Technology, respectively, in 2009. Currently, he is an Associate Professor in the Department of Computer Science at Instituto Tecnológico Autónomo de México. He has served as a referee for the Mexican Council of Science and Technology, which has recognized him as a member of the National System of Researchers. He is the author of 30 peer-reviewed articles. In addition, one of his articles was included in the SciVerse ScienceDirect Top 25 Hottest Articles (from April to June 2012) of Computer Science published in Future Generation Computer Systems. Dr. Gutierrez-Garcia has served as a reviewer for numerous international conferences and renowned scientific journals. Furthermore, he served as the program committee co-chair of the IEEE BigData CONGRESS 2014 Mexico City Satellite Session, the work-in-progress track co-chair of the 11th IEEE 2014 International Conference on Services Computing, and the applications track co-chair of the 12th IEEE 2015 International Conference on Services Computing. His research is focused on the design, implementation, and exploitation of agent-based problem solving techniques to achieve complex objectives in continuously evolving, distributed, and service-oriented Cloud systems.

Víctor M. González is Head of the Department of Computer Science and Professor in Human-Computer Interaction (HCI) at Instituto Tecnológico Autónomo de México (ITAM) in Mexico City Dr. González is an applied computer scientist designing and studying the use, adoption and adaptation of Information and Communication Technologies (ICT) in a variety of contexts, including office workplaces, homes, urban communities and public spaces. His current areas of interest and research are: Information Visualization and Visual Analytics, Social Network Analysis, Brain-Computer Interfaces and Cognitive Modelling of Software Programming Practices within the context of Work Fragmentation. He received a PhD and Master degrees in Information and Computer Science from the UC Irvine and a Master degree in Information Systems from the University of Essex, United Kingdom. He is a member of IEEE, ACM SIGCHI and SIG-CHI Mexican Chapter. Dr. Gonzalez is Member (Level 1) of the National System of Researchers of the National Mexican Science Council (CONACYT). He is Past President of the Mexican Computer Science Society (SMCC).

Patrick C. K. Hung is an Associate Professor at the Faculty of Business and Information Technology in University of Ontario Institute of Technology, Canada. Patrick has been working with Boeing Research and Technology on aviation services-related research with a patent on mobile network dynamic workflow system. He is an Honorary International Chair Professor at National Taipei University of Technology and a Visiting Professor at University of Sao Paulo, Brazil. In addition, he was an Adjunct Professor at Wuhan University, a Visiting Professor at the Shizuoka University and University of Aizu in Japan, a Guest Professor in University of Innsbruck in Austria, University of Trento and University of Milan in Italy. Before that, he was a Research Scientist with Commonwealth Scientific and Industrial Research Organization in Australia as well as he worked as a software engineer in industry in North America. He is a founding committee member of the IEEE International Conference of Web Services (ICWS), IEEE International Conference on Services Computing (SCC), and IEEE Big Data Congress (Big Data Congress). He is also an Associate Editor of the IEEE Transactions on Services Computing, International Journal of Web Services Research and International Journal of Business Process and Integration Management, as well as a Coordinating Editor of the Information Systems Frontiers.