

Editorial Preface

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In this 21st issue of the *International Journal of Information Technology and the Systems Approach (IJITSA)*, we report four high-quality research papers.

The first paper entitled as *Strategies to implement Edge Computing in a P2P Pervasive Grid* is authored by Luis Angelo Steffenel at University of Reims Champagne-Ardenne, France, Manuele Kirsch Pinheiro at the Université Paris 1 Panthéon-Sorbonne, France, Lucas Vaz Peres and Damaris Kirsch Pinheiro, both ones at the Universidade Federal de Santa Maria, Brazil. In this paper, the authors *discuss the limitations of traditional big data computing platforms and introduce the principles and challenges to implement edge computing over pervasive grids*. To test and validate these conceptual proposals on edge computing and pervasive grids, the authors report the design and empirical pilot test of a real application (OSE: Ozone Secondary Effects) developed over CloudFIT, which is *a Java-based distributing computing middleware adapted to both computing and data-intensive applications. CloudFIT is structured around collaborative nodes connected over a P2P (People to People) overlay network that provides communication, fault-tolerance and distributed storage, while its scheduling mechanism is based on the FIIT (Finite Independent Irregular Tasks) paradigm. The OSE application is a surveillance and alert system for ultra-violet risks due to ozone-layer events*. Finally, the authors claim these principles and illustrative real case provide evidence on how *edge computing and pervasive grids can be used to develop efficient and flexible big data analytic tools and applications*, with minimal extra costs taking advantage of the computational resources existent in the organizations. Thus, the authors contribute to the systems and software engineering fields with innovations for integrating IT-based systems with edge computing devices (smartphones, and any kind of IoT device) and pervasive grids enhanced with cloud-based external services.

The second paper entitled as *A Hierarchical Hadoop Framework to handle Big Data in Geo-Distributed Computing Environments* is authored by Orazio Tormachio, Giuseppe Di Modica, Marco Cavallo, and Carmelo Polito, all at University of Catania, Italy. The authors report the design and initial laboratory test of H2F: a Hierarchical Hadoop Framework. H2F is proposed to *cope with the issues arising when Big Data are scattered over geographically distant data centers*. The authors, firstly, explain the limitations of using a plain Hadoop approach, for treating distributed Big Data sources. The authors describe their H2F design, test it in a Laboratory environment, and compare and discuss its benefits regarding other competitive hierarchical approaches. Several relevant performance metrics are improved with this H2F prototype. This paper, thus, contributes to advances in systems engineering and software engineering disciplines providing a competitive Hadoop hierarchical framework, and foster further applied research for reaching mature and usable platforms for next generation of Distributed Big Data sources.

The third paper entitled as *A Review of Literature about Models and Factors of Productivity in the Software Factory* is authored by Pedro Segundo Castañeda Vargas and David Mauricio both ones at the National University of San Marcos, Peru. The authors report a systematic review of the 2005-2017 literature on factors that affect the productivity of software factories. While productivity concept is frequently defined, the specific software factory productivity concept is still not standardized,

according to the authors. Thus, they conduct a thorough review and report 10 specific models for measuring software factory productivity and their 74 related factors. Author mapped these 74 factors to the usual phases of a software life cycle, and they found that most of the factors are concerned to Construction/Programming phase. Thus, the authors contribute to the software engineering discipline with a systematic review on software factory productivity factors and with a call for further research toward standardized measurements for software factory productivity items.

Finally, the fourth paper entitled as *Food Security Policy Analysis Using System Dynamics - The Case of Uganda* is authored by Isdore Paterson Gum at Gulu University, Uganda, Agnes Semwanga Rwashana at Makerere University, Uganda, and Benedict Oyo, also at Gulu University, Uganda. The authors investigate a complex problem lived strongly in developing economies: Food Security (FS). FS regarding national context refers to the problem of assuring the mean dietary energy for the total population of a country either by self-production or a wealthy capability to buy it for the population (Pinstrup-Andersen, 2009). The authors manifest that *while FS is experienced also by developed economies, the developing ones have a greater level of severity on the proportion of the population affected* for this negative situation. Thus, the authors investigate the *FS challenges at subsistence farming level using system dynamics tools* for coping such a kind of complex problems for the specific case of Uganda country, a developing economy. *The emerging system dynamics model is conceptualized into four sectors; food production, sales, income and food consumption, representing a real-life food security system. The model is used to evaluate policies for better livelihoods as well as explore strategies for profitable subsistence farming and food security.* The authors, thus, contribute to the systems engineering discipline providing evidence on the usefulness of system dynamics simulation tools for helping national policy decision-makers to explore and propose policies to reduce the FS challenges and barriers found in developing countries.

Hence, we consider that this 21st IJITSA issue contributes –as all published past issues- to advance our scientific and practical knowledge of structures, mechanisms, and plausible solutions on relevant theoretical and real problems found in the fields of Information Technology, Software Engineering, Systems Engineering and/or Philosophy of System Sciences, from an interdisciplinary systems paradigm (Mora et al., 2008). High-quality research papers that contribute to this aim are welcome in this journal. Finally, we (EiC and Associate Editors of IJITSA) express our sincere gratitude to paper's authors, reviewers, and IGI editorial staff, for their valuable participation and assistance.

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