

Editorial Preface

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In this 22th issue of the International Journal of Information Technology and the Systems Approach (IJITSA), we report five high-quality research articles entitled: Modeling Uncertainty with Interval Valued Fuzzy Numbers: Case Study in Risk assessment; An Efficient Complex Event Processing Algorithm based on NFA-HTBTS for Massive RFID Event Stream; A Fuzzy Multicriteria Decision-Making Approach to Crime Linkage; A Domain Specific Modeling Language for Enterprise Application Development; and Application of Methodology Evaluation System on Current IS Development Methodologies.

The first article, Modeling Uncertainty with Interval Valued Fuzzy Numbers: Case Study in Risk assessment, is authored by Palash Dutta, at Dibrugarh University, India. In this article, the author addresses the problem of how to combine Type-II Fuzzy Sets (an interval instead of a crisp number for each point in the membership function) where bell-shaped, triangular and trapezoidal intervals are required, like in the Risk Assessment domain. The author reports none efficient previous known solution (based on author's literature review), and thus presents a technique to combine these types of incomparable intervals. Mathematical solution is illustrated with a realistic environmental case. Initial results achieve this goal, but a core limitation is also reported: the membership function of the resultant IVFN (interval fuzzy numbers) cannot be evaluated, and thus the derived problem on how to evaluate membership function is planned to be pursued by using different interpolation techniques. Fuzzy Logic Systems are part of the core modern techniques in the Systems Approach, and thus this article contributes to the advance of it, and with the aim of IJITSA.

The second article, An Efficient Complex Event Processing Algorithm based on NFA-HTBTS for Massive RFID Event Stream, is co-authored by Jianhua Wang, Shilei Lu, and Yubin Lan at South China Agricultural University, and Lianglun Cheng, at Guangdong University of Technology, also located in China. The co-authors address the problem on how to process efficiently a stream of events that by their volume, velocity, variety, value and veracity are considered a Complex Event Processing situation. They elaborate an efficient complex event processing method based on NFA-HTBTS (Nondeterministic Finite Automaton-Hash Table B+ Tree Structure) and its improvement on the detection time, memory consumption and event throughput metrics is reported via a simulation experiment. The co-authors indicate that the mechanism elaborated is only for massive ordered RFID event streams, and the addressing to massive disordered RFID and massive uncertain RFID event streams is planned as future work. This article contributes to the advances of the Systems Engineering domain where RFID systems are widely deployed. Its potential utilization also in the emergent Internet of Things domain is relevant.

The third article, A Fuzzy Multicriteria Decision-Making Approach to Crime Linkage, is co-authored by Soumendra Goala and Palash Dutta, both at Dibrugarh University, India. These authors address the problem of Crime Linkage, which consists in clustering a set of criminal records that can be associated to the same offender or co-offenders under the analyzed evidence. The authors indicate that obtaining such a cluster can be an easy task with availability of physical evidence (forensic evidence, DNA marks, fingerprints or proper digital evidence among other ones), but in their absence this task

presents difficulties. However, under the assumption of the availability of data on the behavioral acts performed by the offender or co-offenders and contextual complementary data, despite the uncertainty for establishing if two or more criminal records must be linked, it is possible use some computational mechanisms for potential solutions. The authors rely on Hesitant Fuzzy Sets (HFS) and propose a new distance measure for HFS and implements in a Fuzzy Multi-Criteria Decision-Making mechanism applied to identify credit card fraud crimes. Exploratory initial effectiveness of their approach is reported, with the limitation of pairwise comparisons as required. This article, similarly to the first one, considers Fuzzy Logic Systems, and thus this article contributes to the advance of a Systems Approach, and with the aim of IJITSA.

The fourth article, A Domain Specific Modeling Language for Enterprise Application Development, is co-authored by Bahman Zamani and Shiva Rasoulzadeh, both at the University of Isfahan, Iran. The co-authors address the problem of achieving efficiently high-quality software designs for web-based enterprises applications. These ones are usually complex applications for the variety and number of design elements to be considered. The authors rely on Patterns of Enterprise Application Architecture (PofEAA) and Domain Specific Modeling Languages (DSML) for elaborating a particular DSML based on PofEAA, and implements it in the commercial Rational Software Architecture (RSA) tool. Two realistic modeling examples are reported and designer's experiences on the design and the tool are reported. Initial exploratory results suggest productivity and performance benefits for software designers. This article, thus, contributes to the advance of the Software Engineering area.

The last fifth article entitled Application of Methodology Evaluation System on Current IS Development Methodologies, is authored by Alena Buchalceva, at the Prague University of Economics, Czech Republic. The author addresses the problem on how to compare meaningfully Information Systems Development (ISD) methodologies and process frameworks in such a way that produce useful and understandable results for that potential Information Systems developers can make an adequate selection of a ISD in a real ISD project. With the availability of several ISD in the market and the apparition of emergent approaches, this selection task is not an easy one. The author relies on the Methodology Evaluation System METES mechanism which has been previously validated. Nine ISD current ones were evaluated: Rational Unified Process (RUP), OpenUP, Feature Driven Development (FDD), Scrum, Extreme programming (XP), Kanban, Discipline Agile Delivery (DAD), Large-scale Scrum (LeSS) and Scaled Agile Framework (SAFe). The evaluation was conducted by groups of 3-4 graduate students enrolled in a Software Engineering course taught by the author. Initial evaluation results were lately integrated by the author for establishing similarities and differences, and final recommendations for potential ISD developers. The main contribution of this research is the presentation of useful and understandable evaluation information of nine current ISD methodologies/frameworks. As a main limitation is that the evaluation can be biased on behavioral issues from the setting country, and their results could vary in other contexts. Thus, cross-country studies are recommended to be replied. This research contributes to the advance of the Software Engineering discipline with the releasing of updated ISD methodology comparisons.

Hence, we consider that this 22th 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 articles that contribute to this aim are welcome in this journal. Finally, we (Editor-in-Chief and Associate Editors of IJITSA) express our sincere gratitude to article's authors, reviewers, and IGI editorial staff, for their valuable participation and assistance.

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REFERENCES

Mora, M., Gelman, O., Frank, M., Paradice, D. B., Cervantes, F., & Forgionne, G. A. (2008). Toward an Interdisciplinary Engineering and Management of Complex IT-Intensive Organizational Systems: A Systems View. *International Journal of Information Technologies and Systems Approach*, 1(1), 1–24. doi:10.4018/jitsa.2008010101