## Guest Editorial Preface

# The Impact of Fuzzy Set and Intuitionistic Fuzzy Approaches in Relation to Organizational Decision Making

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During recent decades, the use of soft computational approaches with intuitionistic fuzzy sets has been extended to a large variety of applications. Moreover, there is evidence that fuzzy set and intuitionistic fuzzy approaches in organizational decision making systems have received more attention as indicated by recent literature. Thus, many useful soft computational methods like, fuzzy set theory, evolutionary computational intelligence approaches, neural networks are increasingly becoming a key research area in the context of organizational decision making. The concept of incorporating computational intelligence approaches into decision making analysis is feasible and sound. The use of fuzzy and Intuitionistic fuzzy set approaches enables a decision maker to handle uncertain information and subjective vagueness during the decision making process. Further, the essence of evolutionary computational intelligence approaches in theoretical and practical domain has been analyzed in depth for decision making and optimization. Hence, the main objective of this special issue is to facilitate a forum to a wide variety of researchers where decision making approaches under fuzzy set and intuitionistic fuzzy environments are adapted to demonstrate how the proposed procedures can be applied in practice.

In particular, the special issue brings out technical articles related to software development topics such advanced as advanced software engineering, computational intelligence, and Enterprise applications. This special issue received overwhelming response from researchers with high-quality submissions from various countries around the globe. The submitted manuscripts have been reviewed by at least three independent subject experts. However, due to focused area/scope of this special issue, only a few papers have been accepted. Inevitably, hard editorial decisions had to be taken and some high-quality articles could not be included. We expect that this special issue presents the works on novel contribution and bridges the gaps in applying computational intelligence approaches to organization decision making and it also provides stimulations for extended research. We welcome you to the IJIIT volume 12(1). Further, this special issue consists of four papers, and a highlight of the papers has been given below. We encourage the readers/researchers to get more details about the special issue papers that you can access though the journal website and study them in great detail when appropriate.

In the paper titled "A Fuzzy-Based Approach to Support Decision Making in Complex Military Environments", Timothy P. Hanratty et al., reviewed the development of a fuzzy-based system to provide Value of Information (VoI) evaluations to aid analysts in determining the usefulness and reliability of information. This paper also discussed the commonalities between military intelligence analysts and cyber intelligence analysts and the intent to demonstrate the applicability of the VoI fuzzy architecture in the cyber security domain. Further, this paper outlines the application of fuzzy-based techniques to develop technology for assisting military and cyber intelligence analysts in maximizing the quality of their decision making.

Arish Pitchai et al. propose a Quantum Walk based Genetic Algorithm (QWGA) in their paper titled "Fuzzy based Quantum Genetic Algorithm for Project Team Formation" to identify near optimal teams that optimizes the fuzzy criteria obtained from the initial team requirements. Efficiency of the proposed design is tested on a variety of artificially constructed instances. QWGA integrates them into a single objective with a properly defined global optimum. This proposed system can also be modified to improve its applicability to various decision making problems other than project team formation. QWGA approach is suitable for a large set of problems which describe their requirements in natural language and where the optimizing process is time-consuming.

In the paper titled "Comparative analysis of neural network and fuzzy logic techniques in credit risk evaluation, "Mojisola Grace Asogbon and Oluwarotimi Williams Samuel present neural network and fuzzy logic based systems for credit risk evaluation and their performances have been evaluated based on prediction accuracy metric. Using root mean square error evaluation method, the neural network system attained an overall prediction accuracy of 96.89% compared to that of the fuzzy inference system which was 94.44%. The results obtained in this study were based only on prediction accuracy metric, however, useful information that could help in understanding the dynamics of using fuzzy logic and neural network approaches for credit risk evaluation have been provided.

The paper titled "Open Fuzzy Synchronized Petri Net: Formal Specification Model for Multi-agent Systems" written by Sofia Kouah et al., presents an operational semantics for Open Fuzzy Synchronized Petri Nets (OFSyPN) in terms of Fuzzy Labeled Transition System (FLTS for short). FLTS is a semantics model, which allows a concise action refinement representation and deals with incomplete information through its fuzziness representation. Furthermore, the structure can be used to produce a tree of potential concurrent design trajectories, named fuzzy labeled transition refinement tree (FLTRT for short). This paper exemplifies the OFSyPN model through a case study.

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