Editorial

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1 Introduction

Swarm intelligence provides a number of efficient techniques to solve the complex real-life problems. Swarm based algorithms are inspired by collective behaviour of self-organised and decentralised simple agents. These simple agents may be natural or artificial with very low capability. These agents follow very simple rules without any central controlling unit and their behaviour includes some random component also. This type of interaction among these agents results in the emergence of intelligent behaviour and these simple agents are unaware of it (Bansal, et al., 2013). These techniques are able to find the optimum solution of a problem by getting inspiration from some natural phenomenon. Humankind has been continuously attempting to understand nature by evolving some innovative techniques and tools day by day. The area of swarm intelligence is a combination of computing science with knowledge from different streams, such as mathematics, biology, chemistry, physics and engineering. In grid computing, each resource provides and uses services as per requirement. To get better performance it is essentially required making optimum use of available resources, such as load balancing, servicing discovery and workload management in various types of grid (e.g. computational grid, semantic grid, and service-oriented grid).

2 Papers in the issue

This special issue collects several different contributions that extend six selected works presented at the International Conference on Sustainable Technologies for Computational Intelligence (ICTSCI2019).

Narendra, Valarmathi, Jani Anbarasi and Prasanna propose a semi-blind, robust watermarking scheme for the protection of multimedia data from illegal users. This approach capitalises on the scrambled and segmentation of vertex for secret watermarking using discrete wavelet transform.

Sharma, Munjal and Banati propose an entropy-based classification of trust factors for distributed environment.

Silva, Machado, Ribeiro and Ordonez propose a state of the art of resources management approach in fog computing and proposed a model of resource allocation in a fog computing environment. In contrast to traditional solutions, they describe an autonomic architecture as an alternative to the problem of allocation of infrastructure resources.

Igiri, Singh, Bhargava and Shikaa implement the basic African Buffalo Optimisation (ABO) algorithm and its variants, namely Chaotic Levy flight African Buffalo Optimisation (CLABO) and Chaotic African Buffalo Optimisation (CABO), for a cost-effective supply chain network for petroleum distribution schedule. The product distribution matrix consists of twelve products and eight distribution centres or depots compassed by a large number of constraints. The penalty method is employed to handle the constraints in the three variants. The result shows that the CLABO, CABO, and standard ABO reduced the total distribution cost to 24.79%, 24.85%, and 9.35% respectively. The authors deduced four assertions from this study. First, the ABO algorithm is an efficient algorithm for a cost-effective supply chain management. Second, that chaotic functions and Levy distribution significantly affect the search capability of the ABO algorithm. Third, the penalty method is relatively effective in handling large constraints. Last, these algorithms incur less computational cost since the result was realised within few iterations.

Hamid, Hafeez, Hamid, Humayun and Jhanjhi indicate the significance of documenting architectural knowledge (AK) as a key factor in any software design phase. They propose a framework to manage architecture by establishing a mapping of the successful activities of knowledge management in the distributed environment. This opens new questions of research for distance collaboration and management in terms of AK. The framework can also serve the purpose of teaching architecture development and learn about the outcomes of the better and worse decisions.

Kumar and Verma address the problem of very high mobility in aircraft communication and try to rectify this issue by decreasing the overheads. The decrease in overheads over the link may result in improved link quality. OLSR protocol decreases the amount of link state advertisement packets (overheads) to some extent by selecting MPR in every direction. This MPR selection process has been further optimised in the proposed AOLSR by selecting MPRs only in the direction of the destination node. By implementing the hardware code for OLSR and AOLSR, the authors have found that AOLSR is able to perform better in terms of process execution time and total power consumed as compared with OLSR. This article is a step towards hardware implementation of wireless networking on chip (NOC).

3 Conclusion

The authors of this issue have provided different contributions that extend the selected works presented at the ICTSCI 2019. These contributions represent several different approaches related to vector-based watermarking, self-optimisation in fog computing, petroleum product supply chain management, architectural knowledge management considering global software development, classification of trust factors for cloud computing and improved OLSR (AOLSR) for AANETs.

Reference

Bansal, J.C., Sharma, H. and Jadon, S.S. (2013) 'Artificial bee colony algorithm: a survey', *International Journal of Advanced Intelligence Paradigms*, Vol. 5, Nos. 1/2, pp.123–159.