Intelligent Data Analysis 23 (2019) S1–S2
DOI 10.3233/IDA-190003
IOS Press

Editorial

Dear Colleague:
Welcome to the 2018 special issue of Intelligent Data Analysis (IDA) Journal.

This special issue will address some of the evolving research with regards to intelligent systems, including selected 10 best papers that have undergone the strict peer-review process by the guest editors, the Conference Technical Program Committee and reviewers of FSDM2018. The 4th International Conference on Fuzzy Systems and Data Mining (FSDM2018) was held during Nov. 16–19, 2018, in Bangkok, Thailand. The guest editors solicit recent results mainly concerned with recent advances and challenges in the theory and applications of broadly perceived intelligent systems. With respect to tools and techniques, a special emphasis will be on modern artificial intelligence, fuzzy logic and fuzzy systems (fuzzy sets, rough sets), hybrid systems, computational intelligence (evolutionary computation, neural networks, swarm intelligence, etc.), data analysis, data mining and knowledge discovery, machine learning (including deep learning), information aggregation and fusion, multimedia information processing, Web technology and intelligence, cognitive and affective computing, multiagent systems, "big data", etc. The contents of the papers are briefly introduced below.

The first paper by Zhao *et al*. is focused on how to achieve more ordered aggregation and recommend services that meet the individualized requirements of users. This paper addresses the disorderliness of conventional service aggregation and considers the aggregation requirements of QoS weights with non-functional targets. A simulation experiment was carried out on service recommendations in the tourism domain, which verified the precision, effectiveness and application value of the service recommendation method.

The second and the tenth paper are both by Ye *et al*. The greatest contribution in the second paper is to extend the clustering objects in classical sets to fuzzy sets, which can provide direction for further investigating clustering problems on fuzzy sets. The tenth paper proposes a fuzzy mixed data clustering algorithm by fast search and identification of density peaks (FMTD-CFSFDP). The proposed method extends CFSFDP.

The third paper is by Chen *et al.* Deep Belief network (DBN) is a commonly used model of deep learning, which is a Bayesian probability generation model composed of multi-layer random hidden variables. In this paper, the author use Oil Futures market price forecast as an example, to prove the feasibility of using DBN model to predict labels.

The fourth paper by Yan *et al.* adaptively improves the step size, visual field and crowding degree of artificial fish swarm. The empirical analysis shows that the optimized model has less recognition error and higher recognition stability compared with the traditional ELM classification model.

The fifth paper by Sishuai Liang presents an accurate method for finding an optimal solution to probability 1 in polynomial time. It combines intelligent optimization algorithms such as ordinal optimization, simulated annealing, genetic algorithm (differential evolution algorithm), tabu search, ant colony algorithm and particle swarm optimization, space neighborhood sampling, time neighborhood sampling, and number neighborhood sampling.

The sixth paper by Cheng *et al.* provides a comprehensive survey of the research literature that applies description logics techniques in fuzzy spatio-temporal representation and reasoning. The paper

serves as helping readers grasp the main results and highlighting the direction of fuzzy spatio-temporal representation and reasoning based on description logics.

The seventh paper by Gou *et al.* proposes a trust domain expert collaborative filtering recommendation system. For each sub-matrix, domain experts are used to construct a user-expert trust matrix. Experimental results show that this method not only improves the accuracy and recommended coverage of collaborative filtering-based methods, but also reduces the computation time.

The eighth paper by Zhu *et al.* proposes a highly compressed FP-tree (HCFP-tree). This algorithm increases prefix sharing and reduces the number of nodes in the prefix tree. Experiments conducted on various types of datasets demonstrate that the proposal is always among the fastest algorithms. It also consumes the least memory in many cases, and its memory consumption is comparable to that of existing algorithms in other cases.

The ninth paper by Ma *et al.* presents a novel sharing-based niche genetic algorithm (NGA) with a novel initial population approach based on hybrid K-means to obtain the best chromosome which is then used to perform K-means clustering (termed NicheClust). Sum of Squared Error (SSE), DB-index, PBM-index, and COSEC are used as fitness functions for NGA. The experimental results demonstrate that NicheClust has high performance and efficiency for three GPS location datasets.

We hope the special issue can bring some interesting ideas and recent advances in intelligent systems. Lastly we are grateful to all the authors for their contributions and the referees and Conference Organizing Committee of FSDM2018 for their vision and efforts. We would also like to express our thanks to Dr. A. Famili, the Editor-in-Chief of the IDA journal, for his great support to realize the special issue.

With best regards
Dr. Newton Spolaôr, Western Paraná State University, Brazil
Dr. Huei Diana Lee, Western Paraná State University, Brazil
Dr. Feng Chung Wu, Western Paraná State University, Brazil
Dr. Sotiris Kotsiantis, University of Patras, Greece
Guest Editors