Editorial: Advancing computational system engineering

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Biographical notes: Shaocheng Qu is the Director of the Center for Control and Communication and a Full Professor in Control Systems and Communication System at the Department of Information and Technology, Central China Normal University (CCNU), China. He obtained his Bachelor and MSc from Wuhan University of Chemical and Technology in 1994, Naval University of Engineering in 1998, respectively. Then he obtained his PhD from the Faculty of Control Science and Technology, Huazhong University of Science and Technology in China. His main research interest includes non-linear control theory, system modelling and control, complex system and system dynamics. He has published over 80 papers on these topics and provided consultancy to various industries. He edited or co-edited five books on system science and published a monograph on sliding mode control theory and application for uncertain system. Currently, he acts as Editor-in-Chief and member of the editorial board of several international journals.

1 Introduction

Recently, numerous progress has been made in the development of interdisciplinary computational algorithms, intelligent computational and computational engineering. To provide a constructive forum among researchers for developing and exchanging new ideas on multidisciplinary and multi-criteria computational analysis and computational engineering, it is my pleasure to announce the launch of the *International Journal of Computational System Engineering* (*IJCSysE*) by Inderscience Publishers.

Following definition from IEEE Computational Intelligence Society, computational system defines its subjects of interest as neural networks, fuzzy systems and evolutionary computation, including swarm intelligence. But the exactly definition of computational systems is a difficult problem and is subject to a great deal of debate. From the perspective of computation, the system can be called computational system if its can be characterised by its flexibility, adaptability, memory, learning, temporal dynamics, reasoning, and the ability to manage uncertain and imprecise information. Following the above viewpoint, many new computational algorithms and computational systems are springing up, such as cognitive informatics, data mining, graphical methods, intelligent agents and intelligent systems, knowledge discovery in data, machine intelligence, machine learning, natural computing, parallel distributed processing, pattern recognition, probabilistic methods, soft computing, multivariate statistics, system optimisation, social-computational systems, computational systems biology, language computational systems, e-education systems and e-commerce systems.

Generally speaking, computational systems emulate human or biology mental faculties such as adaptation and learning, planning under large uncertainty, coping with large amounts of data, etc. usually, successful applications of computational intelligent systems deal with several of these aspects. Therefore, it is natural to combine various technologies with different capabilities within one system. So one objectives of this journal will focus on the fusion among the all kinds of computational algorithms and technologies. On the other hand, there still exists the gap of computational modelling and computational engineering in social-computational systems, computational systems biology, language computational systems, e-education systems, e-commerce systems, and agricultural and resource economics. So the other objective of this journal is to focus on new computational modelling and analysis among those domains.

2 Subject coverage

The primary aim of the *International Journal of Computational Systems Engineering* (*IJCSysE*) is to publish high-quality papers of new developments and trends, novel techniques and approaches in the field of Soft computing, Intelligent information systems, intelligent computing, understanding of complex behaviours and patterns, computer technology and application. Topics of interest to *IJCSysE* main include soft computing, intelligent information systems, computer technology and application.

Soft computing includes fuzzy systems and rough sets, fuzzy optimisation and decision making, evolutionary computation, neural networks, human-machine learning, knowledge discovery and data mining and approximate reasoning, etc.

Intelligent information systems involve artificial intelligence and expert systems, knowledge-based systems, decision support systems, management systems, e-education systems, e-commerce systems, e-governance systems, social systems analysis, social computing and behaviour modelling, etc.

Computer technology and application focuses on computer games, virtual reality, computer graphics and multimedia, computer-aided design, computing practices and applications, software engineering and management, management techniques and methods, human computer interaction and real-time systems, etc.

3 Inaugural issue

In this inaugural issue of the *International Journal of Computational Systems Engineering*, we present a wide range of research with a variety of application areas. The first issue of *IJCSysE* comprises of eight papers.

The first paper discussed modelling of asset integrity management process based on a case study for computing operational integrity preference weights. The study illustrates how to model asset integrity management processes in general as well as how to calculate operation integrity preference weights complying with 'triple bottom line' using an analytic hierarchy process.

The second paper talked about rules mining from multi-layered neural networks. S.M. Monzurur Rahman, Md. Faisal Kabir and F.A. Siddiky propose a novel rule mining algorithms from multi-layered neural networks. The proposed rule mining methods clusters attributes rather than examples of data and from clusters rule mining becomes fast and manageable. Moreover, two constraints support and confidence give the controls over the mining result of the proposed method.

Kuldeep Kumar, R.K. Aggarwal, and Ankita Jain aimed to build a connected-words speech recognition system for Hindi language. A system has been developed using hidden Markov model toolkit that uses hidden Markov models for recognition. The system has been trained to recognise any sequence of words selected from the vocabulary of 102 words. The experimental results show that the presented system provides the overall word-accuracy rate of 87.01%, word-error rate of 12.99%, and word-correction rate of 90.93% respectively.

The fourth paper attempted to propose an effective recommender system which is able to serve both individuals and groups of mobile marketplace users. This method is novel in its ability to recommend items for groups of users with applicable justifications based on their profile. The quantification of recommendation is subjectivity captured by understanding the influence of item features among user profiles. The framework is implemented and evaluated using synthetic and real datasets and has shown good results.

The next paper is to design tool of 'expert locator', which can find people with relevant expertise or experience for a given subject. The potential value of the expert locator is directly related to the size of the searchable population. The locator is designed to provide instant searches for people based on their qualifications, teaching experience in the field, research and activities.

The sixth paper developed the theme of the conventional differential protection of the transformer. The proposed algorithm is based on probabilistic neural network (PNN) and use of the spectral energies of detail level wavelet coefficients of differential current signal for discriminating magnetising inrush and fault condition in the transformer.

The seventh paper proposed to use the generated knowledge result of an algorithm for knowledge discovery in large database. Authors discussed these problems and proposed a pragmatic solution by proposing a new approach for KDD and by defining a new method to support database flexible querying. Authors proved that this approach is optimum sight that the evaluation of the query is not done on the set of starting data which are enormous but rather by using the set of knowledge on these data.

In the last paper, parallel RK(5,6) algorithms are employed to validate the potential behaviour under improved fuzzy cellular neural network paradigm for an edge detection problem. It is observed qualitatively that by employing three different parallel RK(5,6) numerical integration algorithms, the edges of the output images are proved to be feasible and effective. The significance of the simulator is capable of performing raster IFCNN simulation for any kind as well as any size of input image.

4 Invitation to contribute

I would like to thank all members of the editorial board of *IJCSysE* for your constructive suggestions and hard review work. At the same time, I represent all members of *IJCSysE* to sincerely thank all authors of contributions.

The editorial team of *International Journal of Computational Systems Engineering* sincerely invites both professionals and academics to contribute their recent research to journal. We look forward to receiving research and papers from all over the world.