Preface

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Biographical notes: Vishal Bhatnagar holds a BTech, MTech and PhD in the engineering field. He has more than 18 years of teaching experience in various technical institutions. He is currently working as a Professor in Computer Science in the Engineering Department at Ambedkar Institute of Advanced Communication Technologies and Research (Government of Delhi), GGSIPU, Delhi, India. His research interests include database, advance database, data warehouse, data-mining, social network analysis and big data analytics. He has to his credit more than 100 research papers in various international/national journals and conferences. He is also on the editorial boards of many international journals.

Computational engineering is a pioneering solution to complex engineering problems. The development and application of computational models and simulations, often coupled with high-performance computing, can solve complex physical problems arising in engineering analysis and design (computational engineering), as well as natural phenomena. In many fields, computer simulation is integral and therefore essential to business and research. Computer simulation provides the capability to enter fields that are either inaccessible to traditional experimentation or where carrying out traditional empirical enquiries are prohibitively expensive.

The aim of the special issue is to provide a quality publication with innovative ideas and implementation methodology to upcoming budding researchers and users in the modern era.

The unique characteristics of the special issue are:

1 The proposed work of eminent researchers in the aspect of global information system like industrial systems evolutionary computation, autonomic and autonomous systems, bio-technologies, knowledge data systems, mobile and distance education, intelligent techniques, logics, and systems, knowledge processing, information technologies, internet and web technologies, digital information processing, cognitive science and knowledge agent-based systems, mobility and multimedia systems, systems performance, networking and telecommunications, software development and deployment, knowledge virtualisation, systems and networks on the chip, context-aware systems, networking technologies, security in network, systems, and applications, knowledge for global defence, information systems (IS), IPv6 Today – technology and deployment, modelling, optimisation, complexity, control theory and systems, fault-tolerance and reliability, data engineering, enterprise computing and evaluation, electrical and electronics engineering, economic decisions and IS, intelligent agent technologies, intelligent and fuzzy information processing, intelligent computing and knowledge management, intelligent systems and robotics, fault-tolerance and reliability, fuzzy logic and systems and genetic algorithms which are current topics of research will be part of proposed publication.

2 This special issue is targeted towards providing quality, best and latest research by eminent researchers considering how such researches affect and have significant influences on the public in their everyday life.

3 The area which will be part of published work will have a significant influence on business users, the public and has a great impact on society.

This special issue is a collection of five papers which are written by eminent professors, researchers and industrialists from different countries. The papers were initially peer reviewed by the editorial board members, reviewers and industrialists who themselves come from many countries.

In the paper 'CloudCampus: building an ubiquitous cloud with classroom PCs at an university campus', authors investigated how to integrate common desktop PCs, with a wide cardinality inside a university campus, on a cloud infrastructure to lower cost efforts, and how to deliver appropriate services to researchers. Authors proposed a model to categorise applications, show how to build the infrastructure and present performance and consumption results. Authors proved that The CloudCampus model to be a good archetype for aggregating PCs to the cloud.

In the paper 'Design of PID controller for magnetic leviation system using modified gravitational search algorithm', authors presented gravitational search algorithm (GSA) is swarm intelligence-based algorithm which is inspired from the law of motion and law of gravity. GSA leads to the loss of the exploitation capability. To find a trade-off between exploration and exploitation capabilities of GSA, a modified gravitational search algorithm is

proposed namely exponent inertia weight-based GSA (EIWGSA). The proposed algorithm maintains a proper balance between the exploitation and exploration skills of GSA by introducing an exponent inertia weight (EIW) parameter. The proposed algorithm is implemented over 15 benchmark functions and compared with basic GSA, BBO and PSO algorithm. Then, the MGSA algorithm is applied to design of PID controller for the magnetic leviation system over a wide difference operating air gap as 3 mm, 10 mm and 17 mm.

In the paper 'Fast and effective image retrieval using colour and texture features with self-organising map', authors presents a content-based image retrieval is an emerging area in computer vision, in which we retrieve similar images from the huge set of database on the basis of their own visual content. Most of the image retrieval systems are still, incapable of providing better retrieval results in less searching time. In this paper, we introduce self-organising map (SOM) clustering approach with fusion of features. Using SOM, system performances are improved by the learning and searching capability of the neural network. Here, first authors extracted colour moment, colour histogram; local binary pattern, colour percentile, and wavelet transform-based colour and texture features. All these features are computationally light weighted, speedup the process of image indexing. Hereafter, all these features sets are fused together with equal weight. Then, these hybrid features are fed to SOM which generates clusters of images, having similar visual content. SOM produces different clusters with their centres. Further, query image content are matched with all cluster representative to find closest cluster. Finally, images are retrieved from this closest cluster using similarity measure. So, at the searching time the query image is searched only in small subset depending upon cluster size and is not compared with all the images in the database, reflects a superior response time with good retrieval performances. Experiments on benchmark database show that the proposed clustering with hybrid features performs significantly encouraging.

In the paper 'TripletDS: a prototype of dataspace system based on triple data model', author proposed that a dataspace system provides a powerful mechanism for searching and querying the structured, semi-structured, and unstructured data in an integrated manner. This paper aims to build a prototype called as triplet dataspace system (TripletDS) to provide an on-demand large-scale data integration solution with less effort. The TripletDS is a prototype of dataspace system based on triple model. The triple model is a simple and flexible data model which supports the subject-predicate-object (SPO) query language. The proposed prototype has the ability to efficiently bridge the gaps between syntactic and structural heterogeneity among data. The performance of TripletDS has been verified on the datasets including personal data and relational data.

In the paper 'A fireworks algorithm for solving travelling salesman problem', a novel swarm intelligence algorithm inspired by observing fireworks explosions, called fireworks algorithm (FW), is proposed for solving the travelling salesman problem (TSP). The TSP is a well-known NP-hard combinatorial optimisation problem. The problem is easy to state, but hard to solve. Many real-world problems can be formulated as instances of the TSP, for example, computer wiring, vehicle routing, crystallography, robot control, drilling of printed circuit boards and chronological sequencing. The proposed algorithm has been performed on TSP instances taken from TSPLIB library and has been compared with other methods in the literature. Computational results showed that the proposed firework algorithm is competitive in terms of quality of the solutions compared to other techniques.