
Editorial

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Biographical notes: Zhigao Zheng (M12-M12-M16) was an Associate Researcher with the National Engineering Research Centre for E-Learning and Collaborative and Innovative Centre for Educational Technology at Central China Normal University. He is the Guest Editor of *ACM/Springer Mobile Networks and Applications*, *Multimedia Tools and Applications*, *Journal of Intelligent & Fuzzy Systems*, *Computers & Electrical Engineering*, *International Journal of Networking and Virtual Organisations (IJNVO)* and so on. He is also the Reviewer of many journals such as *IEEE Transactions on Big Data*, *IEEE Transactions on Industrial Informatics*, *Journal of Network and Computer Applications*, *The Journal of Supercomputing*, *Multimedia Tools and Applications* and some top conference such as *SC'16*, *CCGrid'16*, *NPC'15* and *NPC'16*. His research interests include distributed data stream analysis, cloud computing and graph computing. He became a Member (M) of CCF in 2012, Member (M) of ACM in 2012 and Member (M) of IEEE in 2016.

Jinming Wen received his Bachelor degree in Information and Computing Science from Jilin Institute of Chemical Technology, Jilin, China, in 2008; his MSc in Pure Mathematics from the Mathematics Institute of Jilin University, Jilin, China, in 2010, and his PhD in Applied Mathematics from McGill University, Montreal, Canada, in 2015. He was a Postdoctoral Research Fellow at Laboratoire LIP, ENS de Lyon from March 2015 to August 2016. He is currently working as a Postdoctoral Research Fellow at the Department of Electrical and Computer Engineering, University of Alberta. His research interests are in the areas of lattice reduction with applications in communications, signal processing and cryptography, and sparse recovery.

He was a Guest Editor for four special issues including one in *ACM/Springer Mobile Networks and Applications*.

Shuai Liu is currently an Associate Professor at Inner Mongolia University, China. He serves or is serving as an Editor or Guest Editor for many technical journals. He has published more than 20 papers in Elsevier and Springer. His interesting research domains contain fractal application, image processing and computer vision.

For years, many criteria are applied to examine the quality of network objectively. This quantification is called quality of service (QoS). The term QoS refers to the ability of the network to achieve more deterministic behaviour. The behaviour measures if data can be transported with a minimum packet loss, minimum delay and maximum bandwidth. Since QoS does not consider the user's perception, another technique QoE is presented which takes into account the user's opinion. QoE is a subjective metric that ties together human dimensions such as user perception, expectations, the experience of application and network performance.

Adopting a more holistic understanding of quality as perceived by end-users, the study of QoE is becoming a highlight in this subject. Indeed, today, it is essential that the service provider needs some ways to continually measure and improve QoE.

A variety of factors can affect the perceived quality, including network reliability, the content preparation process and the terminal performance. QoS of multimedia streaming services over IP networks is determined by several interdependent parameters. Some of the parameters can be adjusted, such as bandwidth and image resolution, while others cannot be adjusted, such as packet loss rate and delay. These missing parameters must be considered in order to increase the end user's satisfaction which is not only influenced by QoS parameters but also by subjective parameters (QoE) such as user experience, user interest and user expectation. A number of researchers employ different methods according to the media type (e.g., voice, video and image). For each media type, there are a variety of measurement methods having different computational and operational requirements.

This special issue features eight selected papers with high quality. The first paper, 'Gradient vector flow combined saliency analysis for active contours', the author put forward a new active contours algorithm. The proposed algorithm uses the advantage of saliency model in distinguishing objects and background to increasing the ability of GVF method to segment complex images. Experiment results on natural images show the better performances of proposed method compared to the tradition GVF method.

Under the big data, companies can apply data mining and application to accurately grasp the market changes and customer needs and then adjust the products and services to enhance the professional and long-term development of enterprises. Paper 'Research on precision marketing data source system based on big data' combined with precision marketing data source system based on big data, research around precision marketing connotation and ideological, and enterprise applications around big data, introducing data standardisation and quality of the model, find a basic method to promote data standardisation, thus to provide reference for constructing data source system based on big data.

Many practical problems can be attributed to the clustering problem. Paper ‘A semi-supervised locally linear embedding spectral clustering algorithm’ solved this problem by using spectral clustering algorithm. Compared with the traditional clustering algorithm, it can be clustered in any shape of space, and obtain the global optimal solution. Based on the classical NJW algorithm, utilising the supervision information to guide the clustering process, the result of clustering is more accurate. Meanwhile, combined the manifold learning with a semi-supervised spectral clustering algorithm, and the data’s dimension will reduce based on locally linear embedding. LLE method is a non-linear dimension reduction method. Based on the heuristic thinking, calculated distance matrix, a reasonable number of nearest neighbours could be funded, thus the author achieves the purpose of dimension reduction. Moreover, clustering based on reduced dimension data, the same clustering results as the original data could be obtained. The proposed algorithm ensures high correctness and improves the running speed, and reduces the overhead of computation. Experimental results show that the proposed algorithm could achieve better clustering effect on artificial datasets and real datasets.

Predicting brain activity associated with concrete concepts has been attracted wide attention in brain imaging studies. Paper ‘Sparsity constrained model for the semantic features selection’ construct a computational model for the link between the stimuli and the brain image. In the model, the neural basis of the concepts is revealed by their cooccurrences with 25 basic verbs in a large text corpus. However, the ordinary regression model cannot make the desired selection among the semantic features due to the small sample size problem. In this paper, the author proposes a sparsity constrained model to automatically choose the relevant semantic features. Specifically, the author explicitly constrains the number of semantic features associated with the individual voxels. The motivation is based on the fact that the responses of a voxel to the stimuli can only be explained by a limited number of neuron activity bases. The experimental results on predicting brain images show the effectiveness of the proposed approach, as well as meaningful representation of the concepts.

Boundary handling and the global best guiders’ selection are of significance to the performance of the multi-objective particle swarm algorithm. Considering the different characteristics of methods of operation, ‘Improved adaptive multi-objective particle swarm algorithm under big data’ propose an improved adaptive particle swarm optimisation (IMAPSO) method. When the algorithm falls into local optimum, start crossover and mutation; when the algorithm’s convergence stagnates, switch the boundary handling operator between the truncation and the exponential distribution truncation methods; when the diversity of algorithm hasn’t improved in a given duration, switch the two operations of trim boundary handling and exponential distribution and the simulation results of the standard test functions demonstrate the effectiveness of the algorithm proposed in this paper.

In the brain function studies, it has been widely attracted attention to predict brain activity associated with concrete concepts. Paper ‘Structured sparsity model with spatial similarity regularisation for semantic feature selection’ construct a computational model to real the neural basis of the concepts by their co-occurrence with 25 basic verbs in a large text corpus. However, the ordinary regression model cannot select desired semantic features and easily over-fits when the number of observations is small relative to the size of the candidate semantic features. To address these problems, the author proposes a structured sparsity model to automatically choose the relevant semantic features

by exploiting the sparsity of responses and the spatial relationships between the voxels. Specifically, the author requires the number of the non-zero responses to be sparse and the responses that two voxels are nearby in the brain to be similar. These are based on the facts that each voxel in the brain is only involved in limited semantic bases and the voxels are spatially neighbour, respectively. The constraints do not only regularise the model fitting, but also have an interpretation in terms of brain haemodynamics. The experimental results on predicting brain images show the effectiveness of the proposed approach, as well as improved interpretability.

Paper 'Delay-dependent stability analysis of convection diffusion equations with delay' concerned with the delay-dependent stability analysis of the one-dimensional and two-dimensional convection-diffusion equations with time delay. Some sufficient and necessary conditions for the asymptotical stability of the equations are proposed. These results lay the foundation for the numerical stability analysis of such kinds of equations.

The increased demand promotes the development of tourism industry, big data has brought a new method for the tourism industry to update value chain and raise industrial development. In the last paper 'A method study on the value chain optimisation of tourism industry based on big data', the author clarifies the definition and characteristics of big data, talking about shaping and upgrading the tourism industry value chain. The internal and external value chain of tourism industry under big data is analysed. Then the author put forward the method construction and development countermeasures of tourism industry based on big data.

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