

---

## Editorial

---

### Fatos Xhafa

Department of Computer Science,  
Technical University of Catalonia,  
Campus Nord, Ed. Omega, C/Jordi Girona 1-3,  
08034 Barcelona, Spain  
Email: fatos@cs.upc.edu

**Biographical notes:** Fatos Xhafa received his PhD in Computer Science in 1998 from the Department of Computer Science of the Technical University of Catalonia (UPC), Spain. Currently, he holds a permanent position of Professor Titular (Hab. Full Professor) at the UPC. He was a Visiting Professor at the University of London, UK, 2009–2010, and Research Associate at Drexel University, USA, 2004–2005. He has published in international journals, conferences/workshops, chapters, books and proceedings. He is the Editor-in-Chief of *IJGUC* and *IJSSC*, Inderscience, and of the Elsevier Book Series *Intelligent Data-Centric Systems and of Lecture Notes on Data Engineering and Communication Technologies*. His research interests include parallel and distributed algorithms, massive data processing and collective intelligence, optimisation, networking, P2P, cloud computing, security and trustworthy computing, among others.

---

Cloud and internet computing technologies have emerged as new paradigms for solving complex problems by enabling large-scale aggregation and sharing of computational data and other geographically distributed computational resources. The continuous development of the internet and the construction of new internet and cloud computing infrastructures are making possible the development of large scale applications from many fields of science and engineering. Cloud and internet computing is an emerging and promising discipline that can have applications ranging from engineering, science, finance, and economics, to arts and humanities. New challenges arise in the modelling of complex systems, sophisticated algorithms, advanced scientific and engineering computing and associated (multidisciplinary) problem-solving environments for internet and cloud computation.

This special issue focuses on new techniques related to internet and cloud computation, including the security, data storage, data analytics and various other interesting techniques. Latest research findings and developments include secure massive cloud data storage and computation, new algorithms and techniques in the field. The special issue accepted six papers based on their quality and suitability, which are arranged as follows.

In the first paper ‘Data security and privacy information challenges in cloud computing’, Kong et al. survey current security and privacy information challenges in cloud computing. The authors analyse the great challenges that appear in terms of data security and privacy information

protection. The current security measurements are discussed and summarised.

The second paper ‘A perspective on applications of in-memory and associative approaches supporting cultural big data analytics’ by Chianese and Piccialli provides a perspective on applications of in-memory approaches supporting analytics in the field of cultural heritage. The proposed approach has been implemented in an information system exploiting associative in-memory technologies in a cloud context, as well as integrating semantic technologies for merging and analysing information coming from heterogeneous sources. The results of ongoing experimentation encourage a business intelligence approach for supporting cultural heritage assets.

Liu et al. in the third paper, ‘Load balancing algorithm based on multiple linear regression analysis in multi-agent systems’, investigate the problem of load balancing in multi-agent systems (MAS). They propose a novel load balancing algorithm based on multiple linear regression analysis by using parallel computing on all servers and using partial information about agents’ communication. The simulation results show that the proposed algorithm can shorten the computing time and increase the total performance in MAS.

In the fourth paper, ‘TERS: a traffic efficient repair scheme for repairing multiple losses in erasure-coded distributed storage systems’, Zheng et al. study a main challenge in erasure coding, namely, how to minimise the amount of data transferred among nodes and reduce

the repair time when repairing the lost data. The authors propose a traffic efficient repair scheme suitable for repairing data losses when multiple nodes fail. An implementation is provided and numerical results confirm that the proposed scheme reduces the repair traffic by 44% on average compared with the traditional erasure codes and regenerating codes. Improvements are also shown with regard to current typical repair methods.

The fifth paper, 'A sound abstract memory model for static analysis of C programs', by Dong, considers an abstract memory model that plays an important role in static analysis of programs. A region-based symbolic three-valued logic is proposed to guarantee the soundness of static analysis, which uses abstract regions to simulate blocks of the concrete memory. The author has built a prototype tool that detects code level defects in C programs.

Chianese et al. in the last paper 'Self and social network behaviours of users in cultural spaces', propose a computational model inspired by neuroscience simulating the personalised interactions of users with cultural heritage objects. The authors compare an enhanced validation approach for neural networks based on classification techniques with a novel proposal based on clustering strategies. The presented model has been extended to simulate social behaviours in a community, through the sharing of interests and opinions related to cultural heritage assets.

The guest editor of this special issue would like to thank the authors for their contributions and the reviewers for their timely and constructive feedback to authors. The support from the journal manager is highly appreciated.