

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)**JOURNAL OF  
COMPUTER  
AND SYSTEM  
SCIENCES**

Journal of Computer and System Sciences 72 (2006) 1119–1120

[www.elsevier.com/locate/jcss](http://www.elsevier.com/locate/jcss)

## Foreword

## Performance modelling and evaluation of computer systems

With the rapid growth of the network technologies and the increasing development of diverse applications, performance modelling and evaluation has gained significant importance in many areas of research. Whilst new applications are facilitating growing users', researchers are facing challenges to provide models, tools, and analysis to aid in system design, performance measurements, prototyping, testing, and evaluation.

Performance modelling and evaluation constitute a fast developing subject with exiting developments on several fronts, as shown by the variety of topics, techniques, and approaches in this special issue.

This special issue presents the best 10 papers from the first workshop titled Performance Modelling of Wired and Wireless Mobile Computing and Networks held in conjunction with the 11th ICPADS 2005, Fukuoka, Japan. These papers were selected by the scientific program committee and were extended and revised before undergoing a rigorous period of peer review. The purpose of this workshop was to provide an international forum for researchers and industry practitioners to present their state-of-art research on performance modelling and evaluation studies in all aspects of wired and wireless networking and computing and to exchange ideas and explore new avenues of collaborations. This workshop attracted a large number of quality papers and the presentations generated very interesting discussions.

Ferro et al. presented a queuing theory-based model to study the behaviour of a traffic analysis system on multi-processor architectures. The proposed model is based on closed networks of queues and evaluates the efficiency of the system depending on the hardware/software platform features.

Botta et al. presented a novel concept called "service condition" to be used in the modelling of real network scenarios under measurement and analysis. To show the real applicability of their proposal, numerical results from a performance evaluation study over real heterogeneous networks (where the integration of LAN, WLAN, ADSL, UMTS, and GPRS is present) were presented.

Er and Seah analysed the message and time complexity of different clustering algorithms and provide insight into how the algorithm reacts to topology changes. The performance of a distributed multi-hop clustering algorithm, mobility-based D-hop (MobDHop) suitable for mobile scenario was analysed and verified against simulation.

Konrad et al. described the data preconditioning modelling technique which is capable of capturing the statistical characteristics of wired and wireless network traces and presented a new methodology, multiple states Markov-based trace analysis (MMTA). They showed that MMTA is better at capturing error burst statistics than classical models and is consistently accurate across different networks.

Pereira et al. discussed the benefits of adopting a self-healing approach to the development of distributed applications based on networked services. Numerical results demonstrated that a distributed application developed with the proposed self-healing middleware will be able to perform smoothly by quickly reconfiguring its services upon detection of failure.

Ikeda et al. in their paper proposed and evaluated an intelligent call admission control (CAC) and routing framework for broadband networks based on fuzzy logic (FL) and genetic algorithm (GA). Simulation results show that the proposed framework has a good performance and is a promising method for QoS routing and CAC decision.

Tan and Jarvis investigated the effects of bandwidth asymmetry on Web-like short-lived transfers. Their work provides an insight into the interactions between TCP data flow and ACK packets over the bottleneck links. Ns-2 based experiments show that these models can predict TCP transfer latency with a high degree of accuracy.

Itaya et al. discussed the heterogeneous asynchronous multi-source streaming (HAMS) protocol for transmitting continuous multimedia contents from multiple contents peers to a leaf peer to increase the throughput, reliability, and scalability in P2P overlay networks. They showed that the HAMS model can support higher throughput and shorter transmission time than the other existing models.

Younas and Chao proposed a new commit protocol for business transactions in composite Web services which aims to improve the performance by reducing network delays and the processing time of business transactions. The performance of the proposed protocol over the existing models is presented through various simulation experiments.

Guan et al. presented a new approach to constraining queuing delays in a buffer which incorporates a dynamically moveable threshold in order to guarantee the QoS in present-day communication networks. The feasibility of the system is examined using both theoretical analysis and simulation.

Finally, I express my deepest gratitude to the scientific committee members and the invited reviewers for their valuable and timely reviews.

Irfan Awan  
*Department of Computing*  
*University of Bradford*  
*Richmond Road, Bradford*  
*West Yorkshire BD7 1DP, UK*  
*E-mail address: i.u.awan@bradford.ac.uk*

Available online 9 March 2006