Foreword and Editorial

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We are very happy to publish this issue of an International Journal of Grid and Distributed Computing by Science and Engineering Research Support Society.

This issue contains 10 articles. Achieving such a high quality of papers would have been impossible without the huge work that was undertaken by the Editorial Board members and External Reviewers. We take this opportunity to thank them for their great support and cooperation.

The paper “Context-Aware Access Control Model for Cloud Computing” states that in view of malicious insider attacks on cloud computing environments, a new Context-Aware Access Control Model for cloud computing (CAACM) was presented. According to the characteristic of cloud computing, we take spatial state, temporal state and platform trust level as context. The model establishes mechanisms of authorization from cloud management role to objects, which enables dynamic activation of role permission by associating cloud management role with context. It also achieves fine-grained access control on cloud objects by supervising the permission of management role in full life cycle. Moreover, it introduces the concept of exclusive managerial role, which extends access control from static protection on resources to dynamic authorization on managerial roles. Further, it describes the approach of role permission activation systematically. CAACM formally proves to be safe and it lays the groundwork for the deployment of CAACM in cloud computing systems.

Paper “Multiscale Belief Propagation on Concrete CT Image Fast Segmentation” proposes an image segmentation fast method based on multi-scale belief propagation to solve the concrete CT image segmentations problem. Firstly, according to the feature of belief propagation algorithm, a self-characteristic multiscale belief propagation (MBP) is proposed; then, according to compute complexity problem in process of belief messages propagation, a method to reduce quantity of algorithm compute is proposed; finally, using standard images to validate nicety and speediness on our method and applying on concrete CT image segmentation.

The paper “An Energy-aware Routing Mechanism for Latency-sensitive Traffics” discusses that with the rapid development of Internet technology and enhanced QoS requirements, network energy consumption has attracted more and more attentions due to the overprovision of network resources. Generally, energy saving can be achieved by sacrificed some performance. However, many popular applications require real-time or soft real-time QoS performance for attracting potential users, and existing technologies can hardly obtain satisfying tradeoffs between energy consumption and performance. In this paper, a novel energy-aware routing mechanism is presented with aiming at reducing the network energy consumption and maintaining satisfying QoS performance for these latency-sensitive applications. The proposed routing mechanism applies stochastic service model to calculate the latency-guarantee for any given network links. Based on such a quantitative latency-guarantee, we further propose a technique to decide whether a link should be powered down and how long it should be kept in power saving mode.
The paper “Security Issues and Challenges of Mobile Cloud Computing” presents a discussion that Cloud computing is proving itself an emerging technology in IT world which provides a novel business model for organizations to utilize software, applications and hardware resources without any upfront investment. Few years later with the broad development in mobile applications and advancements in cloud computing, a new expansion is being expected in the form of mobile cloud computing (MCC). MCC provides a platform where mobile users make use of cloud services on mobile devices. The use of MCC minimizes the performance, compatibility, and lack of resources issues in mobile computing environment. Despite the astonishing advancement achieved by MCC, the users of MCC are still below expectations because of the associated risks in terms of security and privacy. These risks are playing important role by preventing the organizations to adopt MCC environment. Significant amount of research is in progress in order to reduce the security concerns but still a lot work has to be done to produce a security prone MCC environment. This paper presents a comprehensive literature review of MCC and its security issues and challenges.

The Authors of “Print-Scan Resilient Watermarking for the Chinese Text Image” states that digital text watermarking has been a popular way to discourage illicit reproduction of documents by embedding copyright information into them. This study presents two robust watermarking algorithms for the Chinese text image. One embeds watermark by modulating the character spacings and the other is based on the relative heights of characters in the same text line. In the embedding process, the characters are segmented firstly by projecting the image horizontally and then vertically. And the rough segmentation is refined according to the peculiarity of Chinese characters. Then on the basis of character segmentation algorithm, watermark embedding is achieved by shifting characters up or down (left or right). In the extracting process, pre-process operations such as the binarization and image deskewing algorithm are done first to reduce the impact caused by print-scan operation. Then the messages are extracted by comparing the character spacings or relative heights of characters.

In “Autonomic Power Aware Cloud Resources Orchestration Architecture for Web Applications”, endless resources provisioning illusion is the mainstay for cloud computing paradigm. However, the unpredictable volatility nature involving web applications workload demand would highly hinder cloud computing platforms performance, furthermore, expose cloud resources for possible devastation. Accordingly, this work proposes autonomic power aware SLA-oriented cloud resources orchestration two-tier architecture. Despite complexity and uncertainties of the workload fluctuations, the proposed architecture geared for leveraging cloud system resources utilization, ensuring explicit guarantees on web applications’ responsiveness obligations, meanwhile achieving power consumption minimization objectives. The proposed architecture consolidates heuristic methodologies along with control theory approaches in a resource orchestration hierarchical structure. Firstly, an autonomic global controller is presented. The proposed global controller exploits heuristic methodology for mapping virtual machines (VMs) to the appreciate cloud resources in accordance to heuristic multidimensional objectives based placement strategy. Secondly, a proactive fuzzy-logic based local controller is proposed. The proposed local controller aimed at in confronting workloads' sustainable fluctuations via proactive amendment for the placement and provisioning schedules. Furthermore, the proposed local controller oriented towards maintaining active power management policy especially during transient peak of
usage, thereby mitigating overall costs, and extending resources capacity and performance capabilities.

In the paper “Application Research on E-commerce Credit Evaluation based on Opinion Mining”, to increase the buyers know more about the credit of E-commerce product sellers and the purchase rate of the E-commerce users, E-commerce credit evaluation model based on the opinion mining algorithm was put forward. Extract the feature words and views from the products and user reviews, and then make use of statistical and quantitative way to analyze them. In the meantime, a credit evaluation model with transaction time-frequency can be set up, which can be used to analyze the seller’s credit of E-commerce users.

The paper “A Study on Green Cloud Computing” presents a discussion that Cloud computing provides computing power and resources as a service to users across the globe. This scheme was introduced as a means to an end for customer’s worldwide, providing high performance at a cheaper cost when compared to dedicated high-performance computing machines. This provision requires huge data-centers to be tightly-coupled with the system, the increasing use of which yields heavy consumption of energy and huge emission of CO₂. Since energy has been a prime concern of late, this issue generated the importance of green cloud computing that provides techniques and algorithms to reduce energy wastage by incorporating its reuse. In this survey Authors discuss key techniques to reduce the energy consumption and CO₂ emission that can cause severe health issues. They begin with a discussion on green matrices appropriate for data-centers and then throw light on green scheduling algorithms that facilitate reduction in energy consumption and CO₂ emission levels in the existing systems. At the same time the various existing architectures related to green cloud also discussed in this paper with their pros and cons.

The Authors of “An Adaptive Trust Sampling Method for P2P Traffic Inspection” focuses on the sampling-based Deep Packet Inspection for the traffic of P2P file sharing systems, especially for BitTorrent, and proposes a logarithmic-based Adaptive Trust Sampling (ATS) strategy for P2P traffic identification. In the whole process of sampling identification for P2P traffic, the sampling ratio of the current node in a P2P network can automatically adjust and dynamically vary according to the estimator of P2P traffic ratio of historical cycles.

In “A Review of Convergence Analysis of Particle Swarm Optimization”, particle swarm optimization (PSO) is a population-based stochastic optimization originating from artificial life and evolutionary computation. PSO is motivated by the social behavior of organisms, such as bird flocking, fish schooling and human social relations. Its properties of low constraint on the continuity of objective function and ability of adapting to the dynamic environment make PSO become one of the most important swarm intelligence algorithms. However, compared to the various version of modified PSO and the corresponding applications in many domains, there has been very little research on the PSO’s convergence analysis. So the current paper, elaborates the basic principles of standard PSO. Then the existing work on the convergence analyses of PSO in the literatures is thoroughly surveyed, which plays an important role in establishing the solid theoretical foundation for PSO algorithm. In the end, some important conclusions and possible research directions of PSO that need to be studied in the future are proposed.
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