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New Trends and Innovative Methods in Cloud Computing and Big Data

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Keywords

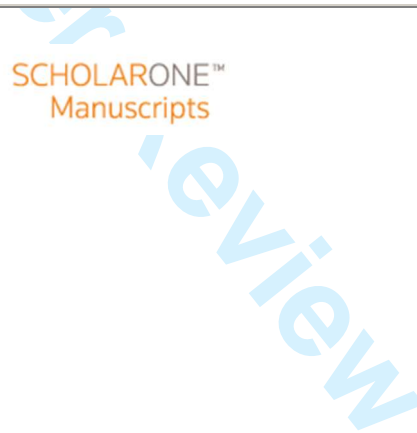
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Concurrency and Computation: Practice and Experience**EDITORIAL****New Trends and Innovative Methods in Cloud Computing and Big Data**

With the rapid development of network technology in recent years, more and more innovative computing models and related applications appear, such as mobile device based cloud computing, social network, intelligent manufacturing and e-business, et.al. Under these situation, massive data will be generated, stored and processed under various circumstances and different requirement [1].

In order to effectively store and analyze the big data based on cloud computing architecture to realize intelligent network-based applications, the new methodologies and technologies for both cloud computing and big data need to be proposed and developed.

This special track focuses on a new strategic research area that addresses “New Trends and Innovative Methods in Cloud Computing and Big Data”. From those submitted papers for the 4th International Conference on Advanced Cloud and Big Data (CBD 2016) held in Chengdu, Sichuan, China on August 13th –August 16th, 2016, five papers are selected that target the following research issues in big data:

- Cloud storage system design and implementation.
- Mobile cloud computing security and privacy protection,
- Big data analysis and processing technique, and
- Big data analysis applications

The secure data access and access performance are two important concerns in the management and storage of large-scale data in enterprises. However, current solutions have the following drawbacks: (1) do not support fine-grained access control and cannot meet the strict secure data access requirements of enterprises, and (2) suffer from the unpredictable access latency. To solve these drawbacks, Dong et al propose an enterprise-oriented cloud storage system, called Frostor, which addresses the secure data access issue through a user account and IP-based fine-grained access control mechanism, and guarantees the access performance via a two-level performance optimization mechanism [2].

With the prevalence of smartphones, the number of Android malware shows explosive growth. As malicious apps may steal users’ sensitive data and even money from mobile and bank accounts, it is important to detect potential malicious behaviors so as to block them. To achieve this goal, Yang et.al propose a dynamic behavior inspection and analysis framework for malicious behavior detection [3]. An automated app behavior inspection platform are developed to install and inspect massive samples so as to collect apps’ dynamic behavior Q3 records. Then these records are exploited to train a string subsequence kernel-based SVM model to classify benign and malicious behaviors.

In the field of machine learning, feature extraction is one of the most important preprocessing in data classification for its effectiveness, and now it has attracted much extensive attention for large-scale data stream preprocessing step, especially in the era of Big Data. Motivated by the advantages of unsupervised and supervised feature extraction, which are two desirable and promising characteristics for dimension reduction, Tan et.al propose a new Semi-Supervised Local

Preserving Embedding Algorithm based on Maximum Margin Criterion (SLPE/MMC) [4]. The proposed algorithm has effectively taken advantage of sample's supervised information, and keeps the geometry structure and the class discrimination information of the manifold.

Recent advances of recommender systems have proven that social relations such as trust and distrust relations among users are helpful in improving recommendation accuracy. Traditional social recommendation methods directly utilize unweighted trust and distrust relations into collaborative filtering framework. These methods will lose their power when the trust or distrust relation data is sparse, which significantly hinders the improvement of rating prediction accuracy. To address this problem, Wang et.al transform the unweighted trust and distrust relations into fine-grained weighted social trust matrix which is denser and encode the trust and distrust degree for pair of users [5]. The weighted social trust matrix is then combined with the rating matrix in a collective matrix factorization framework to implement rating prediction task.

Mobile advertisement distribution effects are vitally important for advertisers as well as users. Status quo studies are focusing on efficient distribution especially when user mobilities are involved. Unfortunately, previous studies have shown the interested area property during mobile advertisement propagation. In achieving efficient and effective mobile advertisement applications, Xu et.al advocate the concept of location-centric mobile crowdsourcing network, where locations are vitally important for advertisement distribution, and mobile users need to be carefully selected for efficiency considerations [6]. Different from traditional user-centric and platform-centric crowdsourcing networks, this work focuses on the mobile advertisement user selection problem when interested area coverage is considered.

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