Data & Knowledge Engineering 104 (2016) 15–16

Contents lists available at ScienceDirect

Data & Knowledge Engineering

journal homepage: www.elsevier.com/locate/datak

Special issue: First International Conference on Big Data and Smart Computing (BigComp2014)

The First International Conference on Big Data and Smart Computing (BigComp2014) was started to provide an international forum for exchanging ideas, issues, challenges, research results, and practical experience on big data and smart computing fields, which have recently drawn much attention and interest in computer science and information technology as well as social sciences and other disciplines. BigComp2014 was held in Bangkok, Thailand, from February 15 to 17, 2014, sponsored by the Korean Institute of Information Scientists and Engineers (KIISE) and technically co-sponsored by the IEEE Computer Society. The technical program of the BigComp2014 was organized into 12 oral presentation sessions (consisting of 53 accepted papers), two invited sessions (consisting of 10 invited papers), two keynotes, and one workshop. The program covered a variety of topics on Big Data and Smart Computing such as Database Technology for Big Data, Big Data Analytics and Social Media, Machine Learning and Artificial Intelligence for Big Data, Software, Algorithms, and Infrastructures for Smart Computing, Applications for Big Data and Smart Computing, etc.

Following this conference, seven of the highest scored papers have been selected for submission to this special issue after further revision and extension. After additional rigorous reviews, three papers were finally accepted for this special issue. These papers are summarized in the following:

The first paper entitled “Parallel community detection on large graphs with MapReduce and GraphChi” by Seunghyeon Moon, Jae-Gil Lee, Minseo Kang, Minsoo Choy, and Jin-woo Lee proposes two parallel versions of the Girvan–Newman algorithm to efficiently discover communities from large-scale networks. The first algorithm, shortest path betweenness MapReduce algorithm (SPB-MRA), utilizes the MapReduce model, and the second algorithm, shortest path betweenness vertex-centric algorithm (SPB-VCA), utilizes the vertex-centric model. In these algorithms, edge betweenness is calculated very fast by finding the shortest path between every pair of vertices *in parallel*. An approximation technique is also developed to further speed up community detection processes. SPB-MRA is implemented on top of Hadoop, and SPB-VCA on top of GraphChi. The performance of SPB-MRA is evaluated using Amazon EC2 instances, and that of SPB-VCA using a single commodity PC. The evaluation results show that the elapsed time of SPB-MRA decreases almost linearly as the number of reducers increases, SPB-VCA outperforms SPB-MRA just on a *single* PC by 4–6 times, and the approximation technique introduces only negligible errors.

The second paper by Hyeong-Il Kim, Seungtae Hong, and Jae-Woo Chang is entitled “Hilbert curve-based cryptographic transformation scheme for spatial query processing on outsourced private data”. In this paper, researches on preserving location data privacy in outsourced databases have been spotlighted with the development of cloud computing. The existing spatial transformation schemes are vulnerable to various attack models. Therefore, the authors propose a transformation scheme to preserve the privacy of spatial data from various attacks on outsourced databases. They also propose a Hilbert curve-based index structure to enhance the efficiency of both range and *k*-NN query processing. Thus, the proposed scheme can reduce the number of message transmissions for query processing and minimize the size of communication messages by performing local data grouping based on the Hilbert curve order. It is shown from the performance analysis that the proposed scheme is robust to attack models while achieving better query processing performance than the existing cryptographic transformation scheme.

The final paper by Jongtae Lim, He Li, Kyoungsoo Bok, and Jae-Soo Yoo is entitled “A continuous reverse skyline query processing method in moving objects environments” and proposes a new efficient continuous reverse skyline query processing method over the moving objects. The proposed reverse skyline query processing method overcomes the problems of the existing methods which are limitedby service domains and require high costs of computation to provide various location-based services for processing a reverse skyline query. The proposed method makes the verification range to guarantee the result of a reverse skyline query. Therefore, it does not need to implement final verification when new objects appear or when moving objects move. In order to show the superiority of the proposed method, the author provides a comprehensive evaluation of the proposed method through various experiments.

http://dx.doi.org/10.1016/j.datak.2016.05.003

Finally, we would like to thank Professor Peter P. Chen, Editor-in-Chief of the *Data and Knowledge Engineering Journal*, for accepting our proposal for this special issue. We would also like to thank all authors for their contributions to this special issue. In addition to the authors, we are very thankful to all the reviewers for their time and effort in reviewing the manuscript, and the staff at Elsevier for their support in the production of this special issue.

Jinho Kim
Kangwon National University, Korea
E-mail address: jhkim@kangwon.ac.kr.

James Kwok
Hong Kong University of Science and Technology, Hong Kong
E-mail address: jamesk@cse.ust.hk.

Kazutoshi Sumiya
Kwansei Gakuin University, Japan
E-mail address: sumiya@kwansei.ac.jp.

Byoung-Tak Zhang
Seoul National University, Korea
E-mail address: btzhang@bi.snu.ac.kr.