



EDITORIAL

APPLIED SOFT COMPUTING FOR ONLINE SOCIAL NETWORKS

*Z. Zhang**, *A.K. Sangaiah*[†]

Social media are computer-mediated tools that allow people to create, share or exchange information, ideas, pictures, audios or videos in virtual communities by using open Internet. Over the past five years, online social network (OSN) websites or services have been widely developed and deployed, including general-purpose OSNs like Twitter, Facebook and Wechat, or some special-purpose ones for multimedia sharing, e.g. YouTube, professional communication LinkedIn, and so on. Whatever the type of an OSN, there exist very interesting and challengeable research works on how to improve efficient social media computing and how to make an effective social network analysis and mining from the perspectives of both academia and industry. In order to better cope with the burning issues, advances on soft computing technologies, such as neural network and system, evolutionary computing and genetic algorithms, fuzzy sets and rough set theories, probabilistic computing, as well as chaos theory and chaotic systems, are paving the road to more valuable and feasible solutions to the emerging social media and big data, finally bringing a brilliant future of wisdom and intelligent social media network. This special issue has addressed the recent trends and solicits the cutting edge research contributions of applied soft computing on social media and online networks.

Among various submissions received for the special issue, we have finally selected 11 high standard manuscripts.

In the first paper entitled “A Novel Framework to Alleviate Dissemination of XSS Worms in Online Social Network (OSN) Using View Segregation”, by Pooja Chaudhary and B. B. Gupta, a client-server based framework that alleviates the dissemination of XSS worms from the Online Social Networks (OSN) was proposed. The experimental testing of this framework was performed on two platforms of open source OSN-based web applications. The observed detection rate of JavaScript attack vectors was effective and acceptable as compared to other existing XSS defensive methodologies. The proposed framework optimized the method of auto-context-aware sanitization in contrast to other existing approaches and hence incurred a low and acceptable performance overhead.

The second paper by Changwei Zhao et al., “Hybrid Matrix Factorization for Recommender Systems in Social Networks,” proposed a novel and efficient hybrid matrix factorization (HMF) method which combined implicit and explicit attributes, and could be used to solve the problem of the cold start and recommender

*Zhiyong Zhang, Department of Computer Science, College of Information Engineering, Henan University of Science and Technology, Luoyang, China, E-mail: xidianzzy@126.com

[†]Arun Kumar Sangaiah, School of Computing Science and Engineering, VIT University, Vellore, Tamil Nadu, India, E-mail: arunkumarsangaiah@gmail.com

interpretation. The authors used MovieLens datasets, and the experimental analysis showed the proposed method was promising and efficient as compared to the existing methods. The main innovations in this paper are as follows: (1) the correlation among users and items are retained in HMF, more information is utilized rather than the simple assumption i.i.d. of users and items factors; (2) the explicit attributes of the user and the items are included in a factors matrix, so HMF can be used to recommend new users and new items; (3) mapping from rating matrix to weights of explicit attributes is realized, and to some extent interpretation of a recommender has been addressed.

The paper titled “FbMapping: An Automated System for Monitoring Facebook Data,” by Md.Sarwar Kamal et al. focused on grouping the datasets collected from active Facebook users to monitor the interaction among thousands of users. Both grouping and tracking were done for handling big datasets with mapping based machine learning techniques such as Fisher Discriminant Analysis (FDA), Canonical correlations, Maximum likelihood and Dynamic Source Monitoring. The FDA was efficient for redundant datasets removal from the training datasets. In this paper adequate experimental comparisons and synthesis were performed with mapping the Facebook datasets. The results proved the efficiency of the proposed based machine learning approaches for the Facebook datasets monitoring.

The paper entitled “No Rounding Reverse Fuzzy Morphological Associative Memories,” by Nai-Qin Feng and Ying-Le Yao, aiming at the shortcomings of hetero associative morphological memories, proposed the no rounding reverse fuzzy morphological associative memories (NR²FMAM) method. Theoretical analysis shows that NR²FMAM, under certain conditions, could realize perfect recall memories, at the same time with a certain noise robustness. Experiments demonstrated that, in many cases, NR²FMAM had better effects of hetero associative morphological memories than the fuzzy morphological associative memories (FMAM). At the same time, the condition, that the recall rate of NR²FMAM was greater than FMAM, was given by the corresponding theorem in this paper.

In the paper titled “Community Detection Algorithm Based on Local Expansion K-Means,” by Lin Li et al., an improved community detection algorithm based on Principal Component Analysis (PCA) mapping and local expansion K-means was proposed to uncover community structure in the complex networks. This algorithm would uncover the community structure more accurately in the complex network, such as the online social network and the Internet.

The paper by C. Huang et al., “Attribute Significance, Consistency Measure and Attribute Reduction in Formal Concept Analysis,” proposes the notions of information entropy in formal contexts and conditional information entropy in formal decision contexts, which are further used to measure attribute significance. Moreover, an approach is presented to measure the consistency of a formal decision context in preparation for attribute reduction in inconsistent formal decision contexts. Finally, a heuristic attribute reduction method is developed for inconsistent formal decision contexts.

In the paper titled “A Novel Attribute-Based Access Control Model for Multimedia Social Networks,” by Zhiyong Zhang and Linqian Han et al., an attribute-based access control model called ABAC-MSN for Multimedia social networks (MSNs) was formulated. A formal theoretical model was established, which in-

cluded constraint rules, data flow rules, policy conflict resolution mechanisms, and was applied to CyVOD.net, a multimedia social-network-platform prototype systems. The deployment and application denoted that this method could effectively and flexibly address the use-case scenario of multi-attribute-based media access control which would improve the social media platforms and resources security.

The paper titled “Exploiting Multi-Sources Query Expansion in Microblogging Filtering,” by Zhen Yang et al., proposed a framework for query expansion based on multiple sources of external information. The authors found out that query expansion was the key technique of the proposed algorithm (Multi-Sources Data Based Query Expansion). The experiment compared the external knowledge set based query expansion methods such as Wiki, WordNet, and those based on the frequency distribution of the local expansion method such as Word2Vector.

In the paper titled “Optimized Trust-Aware Recommender System Using Genetic Algorithm,” by Weiwei Yuan and Donghai Guan, a Trust-aware recommender system (TARS) model was proposed which greatly improved the recommending efficiency of the existing TARS models. The recommender searching mechanism of the new proposed TARS model utilized an optimized skeleton selection strategy. Simulations were held on the real application data to verify the effectiveness of the proposed TARS model. It showed that compared with the existing TARS model, the new proposed TARS model was able to reduce the skeleton maintenance costs by more than 90% with reasonable prediction coverage. This fact greatly improved the recommending efficiency of the existing TARS models.

In the paper titled “Feature Matching of Multi-View 3D Models Based on Hash Binary Encoding,” the authors Haisheng Li et al. proposed a multi-view 3D model feature matching algorithm based on cascade hash binary encoding. In processing of the feature extraction, this study used laplacian operator to sharpen depth image and RANSAC (Random Sample Consensus) as the filter algorithm. In the feature matching stage, the hash binary encoding would get a similar result of the method based on Hausdorff distance, but with much faster matching time.

In the last paper titled “Comparative Analysis of Quality Metrics for Community Detection in Social Networks Using Genetic Algorithm,” Simrat Kaur et al. investigated the performance of four important objective functions namely Modularity, Modularity Density, Community Score and Community Fitness on real-world benchmark networks, using Genetic Algorithm (GA). The performance measure taken to assess the quality of partitions was NMI (Normalized mutual information). From the experimental results, this study found out that the communities identified by these objectives had different characteristics, and modularity density outperformed the other objective functions.

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