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GUEST EDITORIAL

Guest Editorial: Automated Big Data Analysis for Social Multimedia Network Environments

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1 Summary

Recently, with the rapid proliferation of various social network services, it has become very common for people to express their thoughts or opinions on various issues using brief comments. Popular issues include political events, new movies, commercial products, controversial bills and presidential candidates, to name a few. Even though such comments contain personal opinion or preference, they can collectively represent public opinions or trends. In practice, such public opinions or trends could provide very crucial information in many applications. For instance, it is quite important to know from user comments whether public opinion is positive or negative on a specific issue such as new regulation or policy. Another interesting example is to know in advance how big hit a new movie would be from user reviews or reactions on the movie trailer. However, to predict such thing is a very complicated task because there are so many factors that have influence on it. In many cases, such user comments are informal and sometimes unstructured, in that they contain many non-standard structures such as abbreviations, informal terms, emoticons, etc. Most previous works have focused on analyzing long documents such as blogs and hence they are not effective for very short and possibly informal SNS documents. Therefore, due to the abovementioned problems, the big data analysis using data mining and machine learning techniques should be considered in social network environment.

We have finally selected nineteen manuscripts for this special issue after the first, second review processes. Each manuscript selected was blindly reviewed by at least three reviewers consisting of guest editors and external reviewers.

The paper entitled “Multi-Scale Local Structure Patterns Histogram for Describing Visual Contents in Social Image Retrieval Systems,” by Baik et al. [1] proposes a local descriptor for personalized social image collections by utilizing twenty distinct structure patterns in salient edge maps at multiple scales. This allows both fine-grained and coarse-grained features to be

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captured during the image representation process. Integrating spatial saliency with these features into the local structure patterns histogram offers effective image matching thereby improving retrieval and visual content recommendation performance for diverse social image collections.

The paper entitled "View pattern-based adaptive streaming strategy for mobile content delivery services" by Kim et al. [9] proposes a View Pattern-based Adaptive Streaming (VPAS) strategy for mobile content delivery services that considers mobile network environments characterized by limited available bandwidth. The VPAS offers a distinction by requesting smaller data chunk sizes in the remaining parts of the video content, which are not as frequently referenced as the first parts.

In another paper entitled "A Secure Biometric based Multi-Server Authentication Scheme for Social Multimedia Networks," Shehzad Ashraf Chaudhry [3] has reviewed two most recent biometric based multi factor authentication schemes proposed by Lu et al. [14, 15] and proposed an improved biometric based multi factor authentication scheme which is proved to be robust against all known attacks.

The next paper entitled "Big-Data: Transformation from Heterogeneous Data to Semantically-Enriched Simplified Data," by Malik et al. [16] proposes the Semantic Representation model for arranging approaching data assets and develops a process which translates data in a way without any type of information loss. They used a case study to show transformation of relational database textual data into RDF.

The paper entitled "User Privacy-enhanced Security Architecture for Home Area Network of Smartgrid," by Shon et al. [13] proposes a HAN(Home Area Network)-centric Smart grid logical architecture, based on the analysis of the existing reference models to study HAN of Smart grid which handles mainly personal information of customers and presents a security architecture which was made by applying security functions to HAN logical architecture to prevent security threats which can happen due to the security vulnerabilities existing in Smartgrid environment, respectively.

Next paper entitled "Extracting and Evaluating Topics by Region," by Noh et al. [17] proposes a method to extract topics that represent regional interests from news articles collected by region. The proposed method consists of a novel word-weighting step to extract regional keywords and a word-clustering step to extract regional topics based on the associations between the extracted keywords.

In another paper entitled "A Gap Analysis Study between Multimedia Security Research and Education by Meta Data Analysis," Chang et al. [11] study on the multimedia security that have been conducted and to systematically design specialized education for the future. They compare the specialized education response level according to changes in multimedia security studies.

Next paper entitled "ESOTAG: E-Book Evolution using Collaborative Social Tagging by Readers," by Yoo et al. [19] proposes the ESOTAG (E-Book Evolution using Collaborative Social Tagging) model which uses social tagging by which users can add resources to existing books and also do so when authors write a new book.

In another paper entitled "Texture Feature-based Text Region Segmentation in Social Multimedia Data," Kim et al. [12] propose a method for effectively segmenting text areas that exist in images by using the texture features of various types of input images that are obtained in a social multimedia network and an artificial neural network.

Next paper entitled "A Photomosaic Image Generation Method using Photo Annotation in a Social Network Environment," by Seo et al. [18] proposes an algorithm that generates a

photomosaic image by considering social network context and creates a photomosaic that incorporates photos posted by other users in the user's network. They design the algorithm to more frequently select the photos of users who have a close relationship with the user associated with the input image.

In another paper entitled "An Algorithm for Movie Classification and Recommendation Using Genre Correlation," Hwang et al. [6] presents an algorithm for movie recommendation that exploits the genre of the movie to enhance the accuracy of rating predictions. The proposed algorithm consists of three parts: 1) numerical measurement of the correlation between movie genres; 2) movie classification using the genre correlations and recommendation list generation; 3) movie rating prediction using traditional CF (Collaborative Filtering) algorithm.

Next paper entitled "Multi-hop WBAN Configuration Approach for Wearable Machine-to-Machine Systems," by Kim et al. [10] proposes a multi-hop WBAN configuration approach (MWCA) for wearable M2 M systems which can improve network throughput by exploiting multi-channel communications, and it achieves high energy efficiency by reducing the transmission power of each M2 M device. They also investigate the performance of MWCA by using an analytical model, which is validated through the use of experimental simulations.

The paper entitled "Topic category analysis on Twitter via cross-media strategy," by Cho et al. [5] proposes a cross-media approach to define the nature of South Korea Tweets by inferring the topic category distribution through short-text categorization. To do that, they select newspapers as cross-media, examine the categorization of news articles from major newspapers, and then train the classifier based on the features from each topic category. They also propose a word clustering and filtering method to exclude those words that do not provide semantic content for the topic categories.

Next paper entitled "Task rescheduling optimization to minimize network resource consumption," by Zhou et al. [21] proposes a task rescheduling method that minimizes network resource consumption. The method consists of 3 algorithms: 1) obtains a set of good virtual machines from the large quantity of service-providing virtual machines using the skyline operation; 2) A ranking algorithm fuses the data size and the task emergency to identify significant tasks; 3) an algorithm that automatically determines the optimal insertion point for each task. They extend the renowned simulator *CloudSim* and conduct a series of experiments to verify the effectiveness.

In another paper entitled "Latent Semantic Learning with Time-Series Cross Correlation Analysis for Video Scene Detection and Classification," Cheng et al. [4] presents a DTW-based video detection and classification based on the time-series cross correlation analysis with a latent semantic learning to generate the discriminative dynamic scene model for recognizing the event exhibited by a video sequence.

Next paper entitled "Online Distribution and Interaction of Video Data in Social Multimedia Network," by Ji et al. [7] provides a comprehensive technical review and analysis on HDV streaming and interactive techniques applicable for social multimedia network. They firstly introduce the some basic knowledge of sensing, rendering and display of these two types of HDV (such as MVV and video plus depth map). Then they also reviewed HDV coding schemes specially focusing on interactive streaming.

In another paper entitled "Analysis of Effectiveness of Tsunami Evacuation Principles in the 2011 Great East Japan Tsunami by using Text Mining," Yun et al. [20] analyzes an effectiveness of tsunami evacuation principles from descriptive comments from the survivors and the nonsurvivors in the 2011 disaster using text mining method. They used Naïve Bayesian classification for survivors' or non-survivors' full-text comments as input data

corresponding to the six principles (such as P1: Check the fire sources when an earthquake occurs; P2: Immediately evacuate to the hills or higher grounds, and so on).

Next paper entitled "Big data driven decision making and multi-prior models collaboration for media restoration," by Jiang et al. [8] proposes a generic framework for combining multi-prior models and their framework adopt a big reference image set to provide the references and predictions of different popular prior. They also propose the scatter-matrix-based KRR achieve high accuracy and low complexity in big data related decision making task.

The last paper entitled "Image retrieval technique using the clustering based on rearranged radon transform," by An et al. [2] proposes a rearranged retrieval algorithm based on the radon transform and develops a system robust to geometric transformations with images. In their algorithm, the radon transform was performed on query images through pre-processing to obtain each vector value and then, the values were rearranged according to size and after level clustering and normalization, a feature vector table was set up.

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