Editorial Preface

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Rapid development in Information and Communications Technology (ICT) and its related techniques have caused tremendous impacts to our daily lives. One of the most representative instances can be the applications on Big Data and Internet of Things (IoT). Or we can simply consider that the ordinary IoT-empowered techniques and applications have been brought to the next level. Examples such as smart city, industrial internet, wearable and connected devices, etc., can best describe the phenomenon.

Following above-mentioned applications, it is foreseen that a great volume of data will be generated. With the data, especially a great amount of data, scientists can further do the upgrade to the existing techniques, but on the contrary, such size of data may also lead to difficulties of making decisions. And thus how and what kinds of analytics techniques shall be applied to deal with such size of data and support the decision-making process becomes an urgent issue to be solved under the scenario of Internet of Things.

Decision is a sophisticate process, in particular under the uncertain situation that requires the support from analysis or assessment. In the onset of Big Data and IoT era, more reliable data can be acquired for reducing the level of uncertainty benefiting the decision-making quality. However, the uncertainty is unable to be eliminated. The remained uncertainty would still be an issue in the decision-making process. With Big Data and IoT, the behavior of human and system can be analyzed and predicted instantly in so many areas, such as marketing, hospital, traffic, industry, disaster, etc. The decision support can be less difficult than before. Investment is a major decision not only for the government but also for the business, which requires in-depth analysis before action for reducing the risk and cost under the condition of reaching the satisfied effectiveness. We are interested in the way to develop or use

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the analytics techniques to solve decision issue that the result is able to bring decision maker to the critical insight of problem with solution.

As a quick summary of above issues in this promising theme, this special issue is for soliciting high-quality technical papers addressing decision-making process in uncertain condition, modeling or simulation of the system behaviors, decision support methods on the basis of Big Data and Internet of Things scenario.

This special issue received around 45 submissions from over 15 countries where the corresponding authors were majorly counted by the deadline for manuscript submission. All these submissions were considered significant in the area of the expected theme, but however, only half of them passed the first-round review process which is based on a strict and rigorous review policy. After a totally, and average, three round of review, 20 papers were accepted for being included in this issue. These accepted papers mainly look at the theme from the union of Internet of Things, Internet of Vehicle, Recommender System, User Profiling, Machine Learning, RNN-/Granularity-based Model, Security and Privacy, Location-based Service (LBS), Cloud Computing, Big Data, Dynamic Decision Model, Spatial Analysis, Collaborative Filtering, and Computer-Supported Collaborative Learning. All these keywords are considered promising to attract high attentions from the publics.

The paper [1] looks at the use of geographical information service to improve the IoT services. An efficient GPS signal transmission over optical fiber was proposed and deployed. The implemented system supports the delay transmission to calibrate the delay time, and the statistics from the experiments also demonstrate the effectiveness and accuracy of the GPS signal transmission with D-RoF.

The paper [2] has made a very specific contribution in proposing a novel Internet of Things (IoT) mechanism, including unmanned aerial vehicle (UAV) equipped with sensors as well as the wireless network, for improving the firefighting effectiveness with less risk by collecting the critical information from the fire scene. This novel concept has been evaluated by Monte Carlo simulation, and the result has shown the significant improvement from the current traditional firefighting method.

The paper [3] indicates that the proposed Customer Preference Index with Time Factors (CPIT) method can be deployed in physical retailers and online electronic shops to efficiently predict the user behaviors. Authors collected transaction records, as test data for the model, from an existing supermarket, and after several times of empirical experiments, the results have shown that the proposed model is able to provide recommendations that meet the expectations of end users.

The paper [4] proposes a camera-based attention-level assessment method for learning support in a large-scale classroom. The proposed method is proved to be able to assist lecturers by issuing warnings for students with low attention levels. An algorithm was designed to investigate students' attention level based on the change rate of the location of their face landmarks.

The paper [5] constructs a distributed computing environment based on both the software of RHadoop and SparkR for performing the analysis and visualization of air pollution with the R more reliably and effectively. Sensors are applied and deployed to collect the air pollution data in local city of Taiwan. The inverse distance weighting (IDW) method is then used to transform the sensors' data into the density map. Finally, the experimental results show the accuracy of the

short-term prediction results of PM2.5 by using the ARIMA model. In addition, the verification with respect to the prediction accuracy with the MAPE method is also presented in the experimental results.

The paper [6] addresses a promising method named low-complexity matching pattern (LMP) to reduce the space complexity. The LMP is combined with a look-up table (LUT) approach that solves the issue of the excessive calculations generated in AHE during linear interpolation. The experimental results indicate that the modified algorithm is applicable in ultrasound imaging systems as it is able to improve calculation times.

The paper [7] improves an RNN-based approach, WCP-RNN, to solve the Bio-NER problem for Chinese biomedical free text. This method combines word embeddings and character embeddings to capture orthographic and lexicosemantic features at the same time. In addition, POS tags are involved as a priori word information to improve the final performance. The experimental results show the proposed approach outperforms the baseline method; the highest F-scores for subject and lesion detection tasks reach 90.36% and 90.48% with an increase of 3.10% and 2.60% compared with the baseline method, respectively.

The paper [8] then looks at the privacy and security part under the theme of Internet of Things. Authors propose a privacy considered information security risk assessment model that can take both privacy impact analysis and risk assessment into consideration. The proposed model can facilitate risk assessor achieve the comparable and reproducible for the whole risk assessment process. Meanwhile, pISRA can also assist organizations selecting the high-risk item for carrying out risk treatment.

The paper [9] proposes a grid-based indexing with expansion of resident domains for monitoring CRQs for mobile and ubiquitous computing environments. The proposed method expands resident domains for moving objects as large as possible so that they have less chance to inform the server about updates. Comprehensive experiments with various settings have verified that our proposed method outperforms the QR*-tree.

The paper [10] proposes an advanced hybrid procedure to organize multi-expert granularity-based models with comprehensible decision rule-based wisdom to experience the enterprise resource planning system (ERPS) selection and identify its determinants for performance evaluation to employ more efficient deep classifiers for successfully evaluating the ERPS for the suitable system of provider. The study finding implies that the determinants are varied from the class types and benefit interested parties useful references to facilitate positive migration of inter-industry. This paper significantly contributes clear motivation and originality with further good ERPS selection application values.

The paper [11] looks at the support from an emerging IAAS cloud-based service. Authors present dynamic demand-based pricing model to assist the provider to dynamically determine the price of provisioning the cloud services by considering the provider's and users' utility concurrently. Genetic algorithm is applied for the optimized evaluation users' request parameters and provider's computation capacity that will minimize the cost of execution. Experimental results demonstrate that price evaluation more efficient and users' utility increases considerably

using the proposed framework in comparison with the existing utility-based pricing model.

The paper [12] targets to develop an interactive crawling approach and a crawler that overcomes the issue of exploring an unknown web application. Instead of passively receiving directives from the user, proposed crawler actively asks the user for directives when Web pages containing input fields are found. In addition, this method offers a hierarchical directive structure, allowing the user to define multiple values for directive structure, allowing the user to define multiple values for the same input field.

The paper [13] discusses an important topic of dynamic energy management under IoT environment. Authors propose an energy-efficient dynamic decision model for wireless multi-sensor network. Behaviors of the deployed nodes under this network are analyzed. After the analysis, one simple dynamic decision model is then proposed to support the decision-making process in a theoretical way.

The paper [14] intends to combine the regional information of emergency medical resources and the database of geographic information for ambulance to assess optimal method of medical treatment for patients. Authors consider that better decision support system for specific purpose, i.e., medical support, can be implemented once the above-mentioned resources are properly integrated and used.

The paper [15] initializes an iris segmentation technique based on active contour to find the center position and radius of pupil correctly. Results demonstrate that the proposed iris segmentation method can perform well with high accuracy and better efficacy for iris segmentation in images. Through a relatively high-performance algorithm to further cut up the round out the picture of the pupil conversion cutting growth square picture in order to make the judgment for biometric applications.

The paper [16] applies the Computer-Supported Collaborative Learning (CSCL) pedagogy with NetGuru network experimental platform and the Computer-Supported Personalized Learning (CSPL) pedagogy with the Teaching Assistant on Demand (TAoD) network experimental platform, respectively, in the undergraduate school course to assess the distinctions in impacts for the two methods. The results indeed demonstrate the potential of proposed method to support computer-based collaborative learning environment.

The paper [17] targets a respiratory monitoring method based on BP neural network combined with multi-sensor fusion technology. The results can be made into high-quality wearable equipment widely used in athletes' training and competition. The method can also save on various expensive and heavy pieces of equipment. Authors claim that the proposed method can greatly improve the cost and performance of future equipment development for specific and high-end fields.

The paper [18] constructs a two-layer SIR information propagation model and designs an node selection method for coupled network based on TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution). The experimental results show that subjective heterogeneity can hinder the dissemination of information, while the memory effect heterogeneity can facilitate the dissemination of information. In addition, different immune strategies have different effects on different coupled networks, for example, the TOPSIS immune strategy has the best effect in BA_BA network.

The paper [19] looks for a purpose that tests the quality of white-shell eggs and brown-shell eggs through nondestructive full spectral analysis. Authors design a calibration curve of different colors of egg shells based on the training data set. The obtained curve serves as a reference for developing techniques to measure egg freshness and facilitates egg vendor management.

The paper [20] is a survey paper on knowledge extraction techniques for Big Data and Internet of Things. Authors categorize current literature content as content, metadata, collaborative filtering, and citation-based techniques and identified the strengths and limitation for each approach. This paper evaluates published techniques and research-based products to identify relevant document task and identified strengths and limitation for each approaches. Results of this result will greatly help end users to understand current state-of-the-art techniques internal workings for finding relevant papers, understand the relevant strengths and limitations, and explore previously proposed techniques targeting this area.

With the continued and increasingly attracted attentions on Big Data and Internet of Things, we foresee that this fast-growing field will flourish as successfully as what the related computing paradigms have achieved over the past decade and half. We hope the readers will like this special issue and enjoy the journey of studying the fundamental technologies and possible research focuses in this important field.

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