Guest Editorial Preface

Special Issue on Intelligent Data Mining and Engineering-Assisted Mobile Software System Analysis and Design

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In the past decades, mobile systems become more and more popular. It is critical to design associated software systems in this mobile era. Nowadays, various software systems with intelligent functions cooperatively provide people-oriented services by massive intelligent software models and technologies (e.g., machine learning approaches and complex network techniques), network paradigms (e.g., edge computing, fog computing and cloud computing) and smart hardware devices (e.g., IoT devices, wearable devices, and smart sensors). It is worth noting that the current analysis and design of software systems concentrate on two nature attributes: complexity and sustainability. On one hand, since heterogeneous types of sensors spring up, the sensed and interfaced data in software systems are more difficult to be mined and explored, which induces spectacular complexities in data collecting, saving, processing, and transmitting. On the other hand, sustainable solution is a nontrivial goal for any software system. For instance, the internet of things (IoT)-based smart agriculture technology has greatly reduced agriculture's dependence on labour.

Although an enormous amount of effort has been made, the intricate and dynamic data analysis in software systems still requires multi-scale and diverse intelligent data mining and engineering approaches to support. It is urgently intractable that how to leverage intelligent data mining and engineering approaches to satisfy the demands of a software system which is high complexity and sustainability. This primary intent of this special issue is to attract and solicit the recent advances from academic researchers and industry practitioners in the development and improvement of software systems by adopting data mining and data engineering technologies. The eight papers in this special issue cover the theme of this special issue.

The first article, "Intelligent Data Mining-Based Method for Efficient English Teaching and Cultural Analysis," by Qing Ai and Hongyu Guo mainly studies an intelligent English teaching method to improve the quality of English teaching. Specifically, the random forest is firstly used to analyse and excavate the grammatical and syntactic features of the English text. Then, the decision tree-based method is proposed to make a prediction about the English text in terms of its grammar or syntax issues.

The second article, "Intelligent Skiing Posture Detection and Recognition Through Internet of Bodies," by Peihua Liu establishes a system to automatically recognize the skiing posture which can help athletes grasp the skiing postures. First, the skiing images are collected by distributed camera. Second, the skeleton features are extracted to learn a classification model which is used to recognize and adjust skiing postures. Lastly, the analytical results of posture recognition is returned to athletes through Internet of bodies.

The third article, "Mobile Edge Computing to Assist the Online Ideological and Political Education," by Dan Wang and Jian Zhao utilizes a combined optimization to minimize total cost and maximize QoE simultaneously to provide users with better quality of experience (QoE) in the mobile video business.

The fourth article, "Online Music Style Recognition via Mobile Computing," by Lizhu Yuan and Yue Zhang adopts machine learning technology to establish an automatic music style recognition system. First, the online music is process by waveform analysis to remove the noises. Second, the denoised music signals are represented as sample entropy features by using empirical model decomposition. Lastly, the extracted features are used to learn a relative margin support vector machine model to predict future music style.

The fifth article, "Prediction of Football Match Results Based on Edge Computing and Machine Learning Technology," by Yunfei Li and Yubin Hong proposes a football match result prediction method based on edge computing and machine learning technology. Specifically, it first extracts some game data from the results of the previous games to construct the common features and characteristic features, respectively. Then, the feature extraction and classification task are deployed to multiple edge nodes. Finally, the results in all the edge nodes are uploaded to the cloud server and fused to make a decision.

The sixth article, "Video Sequence Analysis for on Table Tennis Player Ranking and Analysis," by Xiaoni Wei establishes a table tennis players' ranking model by using competition videos and prestige scores in the competition relationship network. The competition relationship network is constructed according to the competition events between athletes.

The seventh article, "English Article Style Recognition and Matching by Using Web Semantics," by Mi Zhou and Lina Peng adopts termed-based model to extract the features in web semantics to represent document. The extracted web semantics features are used to learn a reduced support vector machine which help people automatically classify text and liberates them from the tedious document processing work.

The eighth article, "Aesthetic Evaluation of Interior Design Based on Visual Feature," by Zhen Zhang and Jianwei Ban implements an intelligent aesthetic evaluation of interior design framework by using computer vision and artificial intelligence technologies, which can help people choose the appropriate and effective interior design from collected images or mobile digital devices.

In conclusion, the articles presented in this special issue demonstrates fruitful research in the field of intelligent data mining and engineering in mobile software system analysis and design. We wish to thank both the authors and the reviewers for their hard work in helping us assemble this Special Issue, and would also like to express our sincere gratitude to the Editor-in-Chief, Dr. Agustinus Waluyo, for providing this opportunity and lots of guidance throughout the process.

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