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Guest Editors' Introduction

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Service systems are complex socio-technological systems that combine people, physical facilities and software together to offer various types of business services to end users. Traditional software engineering methodologies cannot sufficiently deal with the design, development and operation of such complex service systems due to the huge difference between software and service systems. In recent years, with the flourish of new information technologies, such as cloud computing, edge computing, fog computing, Internet of Things (IoT), mobile computing, micro-services, Artificial Intelligence, and big data, the philosophy of Everything as a Service (EaaS) has pushed many traditional industries into service-oriented business for better service offering and delivery with higher quality and efficiency. Building on deep insights into these new technologies and new service industries, new insights into complex social relationships, values, identities, and organizations to inhabit advanced technological societies, new visions for transforming business and service systems toward improved societal outcomes, and new approaches to the design and developmental complex service systems and governance of continuous service system evolution, are all great challenges in today's service computing and software engineering academic communities. Intensive research is required on advanced software service engineering methods, service innovation and design methodologies, intelligent technologies for services, service industry practices, and so on.

This special issue, as a dedicated forum, aims for the scientific and industrial community to present their novel methodologies, techniques, and solutions which

can address theoretical and practical issues. It is worth mentioning that the submissions are the selected papers with high quality which have been reported at the CCF 13th International Conference on Service Science (ICSS 2020). These selected papers are seriously improved with substantial extensions and recommended to this special issue. At last, there are 6 articles being included into this special issue after a rigorous review process. A brief summary about each article is presented as follows:

The first paper, "Semantic Discovery of Composite GIS Services", by Jiaqi Zheng et al., proposes a composite GIS service discovery mechanism. Given a service requirement, the authors first select parent nodes and remove their inactivated children. Then, the authors use remaining children to build the network and repeat the previous operation until finding the services that contain the required output. Semantic similarity degree is evaluated by services functional description in the networks, which is used to recommend a composite GIS services solution with simulated annealing algorithm. Experimental evaluation is conducted to demonstrate the superiority of the proposed compared with state-of-the-art approaches.

The second paper, "An Effective Method of Evaluating Pension Service Quality Using Multi-Dimension Attention Convolutional Neural Networks", by Chunshan Li et al., proposes a novel approach to evaluate pension service quality by leveraging a multi-dimension attention convolutional neural networks (MACNNs) model. To effectively predict the QoS of pension service, the authors analyze customer review texts and combine the emoticon feature, sentiment feature and word feature together to mine more accurate feature. In MACNNs, attention layer and convolution layer collaboratively work to predict the service quality. Compared with the conventional machine learning and neural network methods, the proposed approach is more objective and accurate to reflect consumers' real evaluation of pension service.

The third paper, "Lecture Information Service Based on Multiple Features Fusion", by Zhongguo Yang et al., proposes a method based on fusing multiple features to locate lecture news on the university web site. These features include the linked relationship between parent webpage and child webpages, the visual similarity, and the semantic of webpages. Additionally, the authors design an information service based on a main content extraction algorithm for extracting lecture information. Stable and invariant features enable the method to adapt to many kinds of campus websites. The experiments conducted on 50 websites show the effectiveness and efficiency of the provided service. The proposed approach is most suitable for implementing high-performance lecture information extraction about certain topic across multiple websites.

The fourth paper, "Urban Region Function Mining Service Based on Social Media Text Analysis", by Yanchun Sun et al., proposes a novel approach for mining urban region functions based on the analysis of social media texts, boosting the various applications such as urban planning and transportation management. The authors first predefine a variety of human activities and design a service to mine the related activities corresponding to each Weibo post using an urban function classification model, and then further describe a region's main functions with a function vector

based on the human activities. The results have been integrated for the implementation on querying service of urban region functions with a developed Web application.

The fifth paper, "Using API Call Sequences for IoT Malware Classification Based on Convolutional Neural Networks", by Qianguang Lin et al., proposes an algorithm for the malware classification problem of the IoT domain to deal with the increasingly severe IoT security threats. The authors present a multi-layer convolutional neural network to classify various types of malwares, where the convolution window slides down the time sequence to obtain higher-level positions by collecting different sequence features, thereby understanding the characteristics of the corresponding sequence position. The results validate the performance on practical suitability for IoT malware classification with high accuracies and low computational overheads by undergoing a comprehensive evaluation.

The sixth paper, "Memory-Aware Scheduling Parallel Real-Time Tasks for Multicore Systems", by Zhenyang Lei et al., describes a memory-aware scheduling policy for parallel real-time tasks on multicore platforms. The scheduling policy consists of two levels: the first level scheduling schedules ready real-time tasks in the task pool to cores, and the second level scheduling schedules real-time tasks on cores. Priorities of tasks which access main memory are increased and the task with the highest priority can be scheduled immediately to preempt the core. In general, this policy provides a valid solution to the problem of interference in main memory on multicore systems with better performance in terms of schedulability rate of tasks.

Finally, we would like to take this opportunity to express our gratitude to all the authors, reviewers, editors and publisher for their expertise and efforts in organizing this special issue. We specially thank Prof. S. K. Chang, the Editor-in-Chief of the International Journal of Software Engineering and Knowledge Engineering, for his advice and great support for the publication of this special issue. We also hope the readers will enjoy reading the articles included in this special issue.