Guest Editorial Preface

Special Issue on Intelligent Data Analysis and Management

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The theme of this Special Issue of JDM is *Intelligent Data Analysis and Management*. It focuses on the theories, methodologies, and software systems for analyzing data intelligently, mostly new algorithms to achieve better results in the targeted applications. JDM is one of the leading academic journals for publishing original research on all aspects of data management, systems analysis and design, and software engineering, including data science and mining, machine learning, knowledge modeling and engineering, among other topics. This special issue follows JDM's tradition to promote innovative ideas and novel methodologies that have been illustrated in the previously published issues of JDM.

This special issue received 21 submissions, 3 of which were accepted after rigorous reviews by experts in the respected areas. The papers in this issue cover several research interests in areas of intelligent data analysis and management. In particular, these papers tackle challenging classification problems using active learning and deep neural networks. Research in these areas has a long history and is advancing rapidly in recent years with significant achievements (Karpathy et al., 2014, Liu et al., 2017, Qiu et al., 2016, Sze et al., 2017). However, challenges remain in terms of more efficient and effective algorithms and fine-tuning of parameters to solve real world application problems. The papers in this special issue address some of these challenges with novel methods and algorithms that apply to specific application domains.

The special issue is a natural addition to the prior research findings published in JDM. Many of the research results published in JDM have been focused on the modeling, design and management aspects of data (databases in particular) and data-processing software systems, whereas some papers published in JDM discussed intelligent approaches to problems in data, including classification problems using convolutional neural network (Jiao et al., 2018). A review on artificial intelligence, machine learning, automation and robotics was recently published in JDM (Wang and Siau, 2019). This special issue, to certain extent, complement the prior JDM research by focusing on intelligent data analysis.

The topics and main contributions of the papers are briefly summarized below:

1. Lei Li, Yuqi Chu, Guanfeng Liu, and Xindong Wu. *Multi-objective Optimization-based Networked Multi-label Active Learning*. An interesting algorithm named MOSS was proposed to improve both the prediction accuracy of unknown labels of nodes during classification and the system overhead for mining the labels of seed nodes with third parties before classification. A novel Multi-objective Optimization-based networked multi-label Seed node Selection algorithm (called MOSS) is proposed in this paper. The structure of the proposed MOSS algorithm is described in detail and its effectiveness is shown through an experiment and the performance comparison between the proposed method and some other methods. The experimental result seems to show the superiority of the proposed method over the other methods since most of the performance measurements (time, memory, micro-F1, macro-F1, and hamming loss) of the proposed method are better than those of the other methods;

2. Zhicheng Wu, Huafeng Liu, Yanyan Xu, and Liping Jing. *Collaboration Matrix Factorization on Rate and Review for Recommendation*. In this paper, the authors proposed a model, named Collaboration Matrix Factorization (CMF), to tackle the recommendation problem. It combines the projection method with convolutional matrix factorization (ConvMF) to extract the collaboration between rating-based latent factor and review-based latent factor. This paper presents a deep learning framework to systematically learn the user/item latent factor within the matrix factorization framework from both rating matrix and item-level textual review data. Specially, convolutional neural network is adopted to embed the textual review data and integrate with the item-level latent factor to the final item-level latent factor, along with the user-level latent factor that generate the final rating matrix;

3. Jingzhou Sun and Yongbin Wang. *An improved approach for audio segmentation and classification*. This paper proposes an improved approach for audio segmentation and classification. The authors achieve the audio pretreatment by audio segmentation and classification. Audio classification is a challenging problem for audio streams such as broadcast news, containing not only single type classes (e.g. speech and music) but also mixed type of classes. In this article, the authors proposed to use the method of dual DCNN, or CNN-DCNN, for audio/voice classification. The dual DCNN method consisting of three networks and multiple data processing phases increased the accuracy of classification for multiple labels. The experiments show the proposed methods increased the accuracy in multiple benchmarks.

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