



Editorial: Special Topic on Data Intelligence in New AI Era



Guest Editor

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Guest Editor

QIAO Yu is a professor with the Shenzhen Institutes of Advanced Technology (SIAT), the Chinese Academy of Science, China and the director of Institute of Advanced Computing and Digital Engineering, China. His research interests include computer vision, deep learning, and robots. He has published more than 170 papers in international journals and conferences, including IEEE T-PAMI, IJCV, IEEE T-IP, IEEE T-SP, CVPR, ICCV, AAAI, and ECCV. He received LV Jiaxi Young Research Award from Chinese Academy of Sciences. He is a senior member of IEEE, and a youth science and technology innovation leader of Ministry of Science and Technology (MOST) of China. His group achieved the first runner-up at the ImageNet Large Scale Visual Recognition Challenge 2015 in scene recognition and the winner at the ActivityNet Large Scale Activity Recognition Challenge 2016 in video classification. His group also achieved top places in wide international vision challenges such as ChaLearn, LSun, and THUMOUS. He served as the program chair of IEEE IICIST 2014.

The new artificial intelligence (AI) era heavily depends on three converging forces: the advance of AI algorithms, the availability of big data, and the popularity of high performance computing platforms. Data-driven intelligence, or data intelligence, is a new form of AI technologies that leverages the power of big data and advanced learning algorithm. It is becoming an extremely active research area with broad area of applications such as computer vision, speech recognition, natural language processing, medial and healthy, intelligent transportation system, multimedia system, communication, and social network.

With the huge volume of data available in various domains, big data brings opportunities to boost the performance of AI system with advanced machine learning especially deep learning techniques. It has been widely verified that deep neural networks achieve significantly better performance than previous shallow models and even surpass human performance in certain specific tasks or datasets. One well-known example is ImageNet Large Scale Visual Recognition Challenge (ILSVRC) which aims to classify or detect objects in images from 1 000 categories. The state-of-the-art deep convolutional neural networks like squeeze - and - excitation networks (SE - Net) have achieved error rates lower than 3%, which is better than human performance (error rate 5.1%). These networks usually include a deep architecture with a huge number of parameters, which are optimized with one million training datasets. In nature language processing, recent language networks like BERT or XLNet leverage more than 100 GB text for training and achieve re-

markable performance on wide tasks like SQuAD, GLUE, and RACE. All these successes heavily rely on the large scale training data. In addition to the amount of data, the label or annotation of data is also important in supervised learning. Although unsupervised learning is desirable in many applications, supervised learning usually exhibits better performance. In the next, it is important to design effective learning algorithms in unsupervised, semi-supervised, or weakly-supervised setup. On the other hand, it also presents unprecedented challenges to manage and exploit big data for a variety of applications. Learning with big data is not easy, which always needs powerful models and efficient training algorithms. Take deep networks as an example. One may need to carefully design network architectures, training losses and strategies, and effectively exploit high performance computing platforms.

This special issue seeks original articles describing development, relevant trends, challenges, and current practices in the field of big data, artificial intelligence and their applications. After careful reviews, four papers have been selected for publication in this special issue.

The first paper is titled "A Lightweight Sentiment Analysis Method". It proposes a data driven approach to perform sentiment analysis of film's critics from the Douban website and visualize the results with a word cloud.

The second paper is a survey paper with the title of "Big Data-Driven Residents' Travel Mode Choice: A Research Overview". This paper surveys the studies of residents' travel mode identification, influencing factors acquisition and choice model construction using data driven approaches.

Face detection is a fundamental yet important problem in computer vision. The third paper "Face Detection, Alignment,

➔ To P. 08

to the Python-based sentiment analysis method, the new ideas and methods of sentiment analysis are expanded. On the other hand, our experiments still have some shortcomings; for example, the accuracy is not very high, which has a possible solution of training the class library by adding data sets to SnowNLP and using short-term emotional polarity analysis only for small project data. We hope our research has a contribution to the research of textual sentiment analysis.

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Biographies

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←From P. 01

Quality Assessment and Attribute Analysis with Multi-Task Hybrid Convolutional Neural Networks” introduces multi-task hybrid convolutional neural networks for face detection, alignment, quality assessment and attribute estimation.

The last paper “RAN Centric Data Collection for New Radio” is from the communication area, which exploits self-orga-

nizing networks and minimization of driver tests to support deployment of new radio (NR) system and conduct performance optimization.

Finally, we would like to thank all the authors, the external reviewers for their contributions and efforts to organize this special issue in this esteemed journal.