Computer Science and Information Systems 18(4): iii–iv https://doi.org/10.2298/CSIS210400iiiC

Guest Editorial – Pattern Recognition, Optimization, Neural Computing and Applications in Smart City

Mu-Yen Chen[1], Jose de Jesus Rubio[2], and Arun Kumar Sangaiah[3]

[1] National Cheng Kung University, Taiwan
[2] Instituto Politécnico Nacional, Mexico
[3] Vellore Institute of Technology, India

Machine Learning was coined in 1980's. It comes under the category of Artificial Intelligence. Without being explicitly programmed by human or assistance, Machine Learning gives the opportunity to the computer to learn automatically. The primary aim is to allow the computer learn automatically without the human intervention. But it has the limitation of handling only smaller dimensional data with lesser amount of inputs and parameters. Due to this drawback, Deep Learning was introduced. Deep Learning on the other hand is the enhancement of Machine Learning which can handle any number of high dimensional data as well as greater number of inputs and outputs. Due to this advancement it can handle complex model in easier manner. Since Deep Learning uses multiple layers to extract high level features from input, it can work with various disciplines such as Biomedical, Computer Vision, Handwriting Recognition etc.

The idea of smart city requires connecting every related matter with the Internet tightly; from public facilities to municipal management systems, it has to integrate information technology with the Internet of Things (IoT) to enhance the quality of life and the resource management of the city. Through collecting various types of data by IoT, utilizing cloud spaces or other types of storage equipment to share data, and conducting big data research to analyze relevant issues could support the municipal decision-making. To improve resource efficiency, all of the devices in a smart city system, including transportation, medical care, electricity, disaster prevention etc, could conduct big data and artificial intelligence analyses to understand the usage of user traffic, logistics, and resource. With the high-performance technology in smart city systems, such as cloud computing, fog computing, and high-consumption sensors, to handle massive data for satisfying the demands from the public.

The first article entitled" The Dynamic Two-echelon MSW Disposal System Study under Uncertainty in Smart City", authors construct a grey fuzzy multi-objective two-echelon MSW (municipal solid waste) allocation model. According to the result, the MSW is prior to be allocated to RDF (Refuse Derived Fuel) plant and incineration plant.

The second article entitled "The Application of E-commerce Recommendation System in Smart Cities based on Big Data and Cloud Computing", authors present one comprehensive evaluation system based on improved collaborative filtering recommendation algorithm under the Hadoop cloud computing platform. The experiential results showed the proposed model has more efficient than the traditional single machine environment.

The third article entitled "Optimization of Intelligent Heating Ventilation Air Conditioning System in Urban Building based on BIM and Artificial Intelligence Technology", this research proposes the energy consumption of building HVAC (heating ventilation air conditioning) system by combining back propagation neural network (BPNN) and Ad-

aboost algorithm. The experimental results illustrate the proposed hybrid Adaboost-BP algorithm can be useful to predict the energy consumption of the air conditioning system.

The fourth article entitled" Face Recognition Based on Full Convolutional Neural Network Based on Transfer Learning Model", authors develop an adaptive scale feature extraction method based on convolutional neural network (CNN). This research also adopts the transfer learning approach to construct the sketch face recognition model by using the training sample. The proposed model can reach about 97.4% and the accuracy rate has been outperformed than the traditional sketch face recognition algorithm.

The fifth article entitled "Background Modeling from Video Sequences via Online Motion-Aware RPCA", authors propose a novel online motion-aware RPCA (robust principal component analysis) algorithm, named OM-RPCAT, which adopt truncated nuclear norm regularization as an approximation method for low rank constraint. In this research, the dataset is used scene background initialization (SBI) and the experimental results illustrate the proposed algorithm has the better performance than traditional online RPCA algorithms.

Finally, in the last article entitled "A Novel Network Aligner for the Analysis of Multiple Protein-protein Interaction Networks", authors present the Accurate Combined Clustering Multiple Network Alignment (ACCMNA) method. It is a novel and accurate multiple network alignment algorithm. After several performance evaluations, the results illustrate the proposed ACCMNA algorithm outperforms better than traditional PPINs (protein-protein interaction networks) of various sizes within an acceptable running time.

Acknowledgments. The guest editors are thankful to our reviewers for their effort in reviewing the manuscripts. We also thank the Editor-in-Chief, Professor Mirjana Ivanovic, for her supportive guidance during the entire process.