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Editorial

With the March 2023 (Vol. 31, No. 1) issue, *CIT. Journal of Computing and Information Technology* enters its 31st year of continuous publishing. Professor Jan Šnajder decided to leave the Editorial Board for other professional endeavors, and I would like to thank him for his valuable service over the years as Editor of our journal. The current issue brings four papers from the areas of machine vision, image analysis, natural language processing and mental health modeling.

The first paper in this issue, titled *Enhancing Automation with Label Defect Detection and Content Parsing Algorithms*, deals with machine vision methods for automated defect detection in circuit breakers. Namely, it is important to automate the appearance and assembly quality of low-voltage circuit breakers. However, current detection processes mainly rely on manual operation, which is cumbersome and error prone. The author of the paper, Min Zheng, proposes character defects on circuit breakers' labels detection based on LeNet-5 convolutional neural network combined with squeeze excitation network (SENet). The methods are further optimized using label content parsing with an LSTM recurrent neural network. The combination of the methods leads to an overall 99.57% average accuracy on self-trained font library, with 84 milliseconds duration for detection, which meets effective detection standards.

In the paper, titled *A Visual Cortex-Attentive Deep Convolutional Neural Network for Digital Image Design*, the author Lei Zheng deals with the topic of enhancing digital image quality. The author proposes an interactive multi-stage convolutional neural network model with addition of an attention mechanism, thus integrating convolutional block attention module with a self-channel interaction module. This approach leads to improved spatial information correlations and feature channel interactions. For improved image segmentation, an attention model is proposed that extracts edge features and integrates them into the network. The overall approach is evaluated on the LIVE 3D Phase dataset, and it demonstrates marked improvements with respect to state-of-the-art methods, with saliency maps closely mirroring human visual perception and having strong agreement with subjective rankings of image quality.

Language pattern, a linguistic level between word/character, plays an important role in the field of natural language processing. In the paper titled *N-gram Language Model for Chinese Function-word-centered Patterns*, the authors Jie Song, Yixiao Liu, and Yunhua Qu focus on N-gram modeling, a proven and effective probabilistic language modeling, and apply the modeling to the study of language patterns. In their work, Chinese function-word-centered patterns are extracted from the LCMC corpus and aligned into pattern chains. The authors train the N-gram language model from these chains to investigate the properties and distribution of Chinese function words and their interactions. In addition to finding about 10,000 function-word-centered patterns in the corpus, the work summarizes and visualizes the most common function-word-centered patterns and content-word-centered patterns and discusses the interactions of patterns.

In the last paper of the issue, titled *Evaluation Model of the Mental Health Education Effectiveness Based on Deep Neural Networks*, the authors Junmei Luo and Shuchao Deng propose a deep neural network model, consisting of four fully connected hidden layers, called DNN-MHE, to evaluate mental health education effects in universities. A questionnaire survey collected data on 916 students' mental health knowledge, attitudes, and behaviors, including demographic data. The

authors present a detailed analysis of the results of the model, with ablation studies on the network architecture and comparison with similar models, showing that the currently proposed model is sufficient for highly accurate representation of students' mental health education results, achieving over 99% accuracy in predicting metrics like knowledge, attitudes, and behaviors from the survey data. Real-world applications of the model would enable universities to assess their mental health programs accurately and efficiently.

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Editor-in-Chief