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# Editorial

The December 2024 (Vol. 32, No. 4) issue of *CIT. Journal of Computing and Information Technology* brings four papers from the areas of power load forecasting, fault detection, multiobjective optimization, and information retrieval.

The first paper in this issue, titled *An Integrated SVM-LSTM Method for VPP Resource Classification and Load Forecasting in Real-time Market Trading*, deals with an important topic for the energy industry. Namely, the authors of the paper, He Zhao, Yucheng Hou, Zhifa Lin, Xin Cao, and Xiao Yu propose to enhance the efficiency and responsiveness of virtual power plants (VPPs) in electricity markets through advanced resource scheduling and trading strategies. They propose a resource grading model based on support vector machine, improved using adaptive synthetic sampling (ADASYN), PCA, and deep embedded clustering (DEC). The improved model achieves high classification accuracy, with an F1 mean of 85.41%. Additionally, an improved long short-term memory (LSTM) network provides ultra short-term load forecasts with an average error of just 0.35%. These models significantly optimize real-time market trading, enabling more precise resource allocation and minimizing deviations between predicted and actual backup service capacities. The models are particularly successful in high electricity price scenarios, where the maximum deviation is only 87.69 kW. The authors consider that future research may leverage generative adversarial networks or transfer learning to further improve prediction accuracy and overcome data sparsity issues that they encountered.

In the paper, titled *Enhanced YOLOv5s for PCB Defect Detection with Coordinate Attention and Internal Convolution*, the author Zhijun Xiao deals with defect detection for printed circuit boards (PCBs). His work introduces an enhanced YOLOv5s deep learning model for automated PCB defect detection, integrating coordinate attention (CA), convolutional block attention mechanisms (CBAM), and inception-style convolutions (IO). This model, trained on a dataset from Peking University that contains 693 high-resolution images covering six common defect types improves small defect detection accuracy while minimizing computational complexity, achieving a detection accuracy of 97.8%, a recall rate of 98.6%, and an F1 score of 98.3%. The CA mechanism enhances spatial feature representation, CBAM strengthens feature map representation, and IO reduces computational overhead, making the model both efficient and precise. These results make the model suitable for industrial PCB inspections, ensuring reliable quality control in electronics manufacturing. Future research could extend its applicability to a wider range of defect types and imaging conditions, further enhancing its robustness and utility in real-time fault detection systems.

Accurate power output prediction in photovoltaic (PV) generation clusters is essential for managing power systems, including adjusting the generation plan of PV power plants or developing on-site PV consumption strategies in advance. In the paper, titled *Improved Multiobjective Genetic Algorithm for Partitioning Distributed Photovoltaic Clusters: Balancing Spatial Distance and Power Similarity*, the authors Yansen Chen, Kai Cheng, Zhuohuan Li, Shixian Pan, and Xudong Hu propose a method to segment distributed PV systems into clusters using the NSGA-II multi-objective genetic algorithm. This approach optimizes cluster division by considering spatial distance modularity and electricity similarity, enhancing the prediction system's convergence speed while reducing complexity and costs.

The algorithm incorporates adaptive mutation and crossover operators, thereby boosting computational efficiency and accuracy while avoiding local optima. The developed method enables aggregating similar PV stations into larger clusters for more effective power predictions, addressing challenges like intermittent and fluctuating outputs caused by meteorological factors. Simulations and practical tests run on 20 PV stations demonstrate that the clustering approach aligns well with real-world scenarios, improving prediction accuracy compared to simpler approaches and supporting safer grid operations.

In the last paper of the issue, titled *Big Data Related Patent Retrieval System Based on Filtering Rules*, the author Xuanrong Zhao deals with the topic of patent retrieval. She proposes a new big data patent retrieval method using filtering rules to address inefficiencies in traditional patent keyword retrieval processes. By combining multiple filtering techniques and building a data storage and processing system using the Django framework, the method enhances the accuracy and efficiency of keyword searches in large patent datasets. Experimental results on the Chinese Wikipedia dataset show that the optimal performance occurs at a threshold for filtered keywords of 100. The method increased keyword usage frequency in training and test sets by 10 and 16, respectively, while reducing the Euclidean distance by 0.88 compared to other methods. Additionally, the model achieved a mean value increase of 0.16 and a cosine value increase of 0.43 over traditional approaches. These results highlight its superior filtering effect and practicality in patent data retrieval. The author suggests that future research should aim to enhance performance for various article types and address keyword duplication challenges.

Alan Jović
Editor-in-Chief