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Editorial

The September 2024 (Vol. 32, No. 3) issue of *CIT. Journal of Computing and Information Technology* brings four papers from the areas of power load forecasting, fault diagnosis, recommender systems, and biomedical data mining.

The first paper in this issue, titled *Power Load Prediction Algorithm Based on Wavelet Transform*, deals with an important topic for the energy industry. Namely, the authors of the paper, Xu Chen, Haomiao Zhang, Chao Zhang, Zhiqiang Cheng, and Yinzhe Xu propose a novel power load prediction system that integrates wavelet transform and digital twin technology. Prior studies proposed various models, including XGBoost with long short-term memory (LSTM), hybrid frameworks with encoder-decoder units, and deep learning for predicting power loads under fluctuating conditions. The novel method that uses a digital twin system, discrete wavelet transform, and an ensemble deep learning model consisting of a deep belief network, LSTM, and multilayer perceptron outperforms the other approaches in accuracy, stability, and speed, proving its effectiveness through extensive testing on PLAID and Simulink datasets. Additionally, on a separate validation dataset from the Fuxin region (2022–2023), it demonstrated resilience to noise and environmental factors, achieving a false detection rate under 5%. Although the current results are satisfactory, future work will explore incorporating other methods for a more comprehensive prediction system.

In the paper, titled *PW-FBPNN: A Hybrid Fault Diagnosis Method for Power Circuit Systems Combining Principal Component Analysis, Wavelet Packet Transform, and Fuzzy Neural Networks*, the authors Xu Chen, Chao Zhang, Haomiao Zhang, Zhiqiang Cheng, and Yu Yan deal with fault diagnostics for complex power circuits. The study presents a new fault diagnosis method, PW-FBPNN, which addresses challenges posed by fault states and non-linear input-output relationships. The PW-FBPNN method integrates principal component analysis (PCA), wavelet packet transform (WPT), and fuzzy back propagation neural network (FBPNN) to enhance diagnosis accuracy and efficiency. PCA was used to reduce data dimensionality, WPT to capture circuit fault features, and FBPNN to adapt to non-linearities and uncertainties, which are common in fault diagnosis. Tested on operational amplifier circuits, the model achieved up to 100% accuracy for most faults and a minimum accuracy of 91.67% for more complex cases. The method outperformed traditional methods in accuracy, speed (diagnosing in 0.01 seconds), and computational efficiency.

Recommendation systems are used across various applications. Libraries store extensive book resources that continue to grow and require constant updates. Therefore, it becomes challenging to offer targeted personalized recommendations for readers. In the paper, titled *Leveraging Deep Learning for Personalized Book Recommendations: A Big Data Algorithm Combining Capsule Networks and Attention Mechanisms*, the authors Jiali Liao and Tianxiang Li focus on a novel recommendation algorithm for books that uses capsule networks (CN) to capture high-level features and self-attention mechanism (SAM) to better understand user behaviors, effectively modeling both short-term and long-term borrowing preferences through a controllable multi-interest network. The algorithm, HBRACDP, short for hybrid book recommendation algorithm considering different preferences, was used to build a model on a real-world dataset with 1,000 students. The model achieved a recommendation accuracy of 97.89% with an error rate of only 0.08%, producing recommendations in 0.09 seconds. Compared to traditional methods, HBRACDP proved significantly better at managing issues like cold starts and data sparsity, which hinder many existing systems.

In the last paper of the issue, titled *Enhancement of Breast Cancer Classification Using Bat Feature Selection with Recurrent Deep Learning*, the author Ali Nafaa Jaafar deals with the topic of biomedical data mining and, more specifically, deep learning models built on gene expression data for breast cancer diagnosis. The study compares three types of recurrent neural networks: RNN, LSTM, and GRU. The focus is on improving classification accuracy by selecting the most relevant features from datasets with high dimensionality. For this purpose, the author uses the bat algorithm, a nature-inspired optimization method. A gene expression dataset consisting of 70 predictive features with measurements from 295 patients was used to evaluate the proposed approach. After data preprocessing, the study integrated the bat algorithm with each model. The LSTM model combined with the bat algorithm achieved the highest accuracy, especially in identifying true positives, with a recall rate of 0.994. This was significantly higher than both the regular RNN and GRU models, with GRU showing the lowest accuracy.

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