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Editorial

The September 2025 (Vol. 33, No. 3) issue of *CIT. Journal of Computing and Information Technology* brings four papers from the areas of graph data processing, computer vision, and business intelligence.

The first paper in this issue, titled *Network Information Processing Analysis Based on Big Data Parallel Graph Partitioning Algorithm*, deals with an important topic in network data processing. Namely, the authors of the paper, Keqing Guan and Xianli Kong propose a parallel graph partitioning (PGP) algorithm tailored for large-scale, dynamic graph structures, such as social networks, by dividing them into balanced sub-graphs for efficient computation. The algorithm employs the distributed Fennel algorithm, optimizing both intra-partition cohesion and inter-partition communication costs through a global objective function. Experimental results on a Hadoop cluster using the Facebook dataset (4,039 vertices, 88,234 edges) show strong performance: network extraction time of 198 ms and overall runtime of 385 ms, outperforming comparable algorithms. The algorithm achieved a resource utilization rate of 0.95 and an energy efficiency ratio of 0.98, significantly higher than the 0.67–0.78 range of existing methods. Furthermore, it maintained a very low load imbalance rate and point weight imbalance rate, indicating highly balanced task and resource allocation. Future work will test its scalability in larger clusters and real-time streaming environments.

In the paper, titled *A Lightweight Real-time Fire Detection Framework for IoT Devices Utilizing Fine-tuned YOLOv10 and Accelerator Module*, the authors Trong Thua Huynh, De Thu Huynh, Du Thang Phu, and Anh Hao Nguyen propose a real-time fire detection framework for IoT devices, integrating a fine-tuned YOLOv10-S model with a Coral Accelerator to balance accuracy and speed in resource-constrained environments. The system was trained on a combined dataset of 34,410 images and 48,718 annotations, covering fire, smoke, and distracting objects. Experimental results show strong detection performance with mAP values exceeding 84% and a maximum mAP50 over 91%, while maintaining low false alarm rates. Leveraging hardware acceleration, inference latency was reduced by 58% compared to CPU-only systems, achieving 1.7 seconds inference per frame and lowering power consumption by about 30%. The proposed framework proved scalable and reliable for diverse applications, including homes, industrial sites, and forest monitoring, offering efficient deployment even under unstable connectivity. Future work will aim to reduce inference time below 1 second/frame and enhance detection under challenging conditions.

Digit recognition methods are significant because they enable accurate extraction of numerical information in noisy environments, which is critical for applications such as license plate recognition, postal services, and commercial bill management. In the paper, titled *Digit Recognition Method Based on Discrete Hopfield Neural Network Optimized by Artificial Fish Swarm Algorithm*, the authors Xin Su, Daiheng Xie, and Yue Zhao propose a digit recognition method based on the Discrete Hopfield Neural Network (DHNN), optimized with the Artificial Fish Swarm Algorithm (AFSA), called the AFSA-HOP integration method. Unlike traditional Hopfield networks that often fall into local optima and fail under noise intensities above 0.2, AFSA's global search ability effectively tunes network weights and thresholds, avoiding pseudo-stable points. Simulation experiments show that AFSA-HOP maintains high recognition accuracy at noise levels of 0.4 and 0.5, where traditional DHNNs and even the versions based on genetic algorithm or particle swarm optimization perform poorly. The framework systematically integrates preprocessing, initialization, optimization, and testing. Results confirm that AFSA-HOP outperforms baseline methods in digit recognition accuracy under noisy conditions, making it suitable for real-world tasks. Future work will aim to enhance AFSA itself or combine it with other optimization algorithms to further boost recognition efficiency and adaptability.

In the last paper of the issue, titled *Lifecycle Prediction for Tobacco Products Using IGWO-Optimized CNN-GRU Network*, the authors YiShuang Qin, JianShuang Jia, Dong Liang, and Che Yu deal with the topic of intelligent product lifecycle prediction. The model they propose is for the tobacco industry and it integrates Convolutional Neural Networks (CNN) with Gated Recurrent Units (GRU), further optimized with an Improved Grey Wolf Optimizer (IGWO). Using a large dataset of 180,000 labeled samples from real-world operations, including sales, logistics, inventory, and environmental data, the model dynamically forecasts lifecycle stages and durations. Experimental results show that the IGWO-CNN-GRU achieves an MSE of 2.13, MAE of 1.17, and R^2 of 0.932, outperforming baseline methods with an average MSE reduction of 17.9% and MAE reduction of 20.1%. The model also achieved 96.2% classification accuracy for fine cigarette lifecycles, identifying stage boundaries within 3 days. The authors point out that future work must address seasonality, cross-industry adaptability, and real-time IoT integration challenges.

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