Foreword and Editorial

International Journal of Multimedia and Ubiquitous Engineering

We are very happy to publish this issue of International Journal of Multimedia and Ubiquitous Engineering by Science and Engineering Research Support soCiety.

This issue contains 6 articles. Achieving such a high quality of papers would have been impossible without the huge work that was undertaken by the Editorial Board members and External Reviewers. We take this opportunity to thank them for their great support and cooperation.

In the paper "Space-Time-Frequency Tight Coupling Routing Algorithm Based on Delay-Tolerant Pheromone Dispersion Search", a kind of Space-Time-Frequency Tight Coupling Routing Algorithm based on Delay-Tolerant Pheromone Dispersion Search is proposed according to the problem of the uneven distribution of traffic according to the high dynamic and low ability of the processing capacity of the Satellite Network Service. In this method, difference of time, space, frequency domain among various satellite business are adopted to make quantitative description and dynamic learning towards the phernmone mentioned in the algorithm, thus the link status in the satellite network can be reflected by the phernmone dynamically. The new strategy can not only overcome the existing disadvantage of single reference value and low learning ability of algorithm, but also solve the local tidal effects issue resulted from the high dynamic of network and low processing capacity of satellite nodes. This algorithm can monitor the distribution of the traffic in real time and adjust the routing strategy in accordance with the results.

Authors of the paper "Domain Specific Predictive Analytics: A Case Study With R" are interested to perform experiments on the areas, Supply Chain Risk Management, Credit Scoring and Bankruptcy Prediction. When comparing to previous studies on this topic, our research is novel in the following areas. All the experiments carried out in this paper have used three different application specific data repositories that are described in detail in Design and implementation section. Focused on making use of traditional predictive techniques Linear Discriminant Analysis (LDA), Quadratic Discriminant Analysis (QDA) and compared their performance with respect to Accuracy, Misclassification, Precision, Recall, prevalence and F-Score.

The paper "The Matching Research on Carrying Capacity of Shenyang Dalian Highway and Development of High-tech Industry Belt in Central and Southern Liaoning Province" uses time series prediction and linear regression model to forecast respectively the carrying capacity of Shenyang Dalian highway and the freight demand of high-tech industry belt in central and southern Liaoning province from 2016 to 2020, then analyzes their matching condition, finally, drawing a conclusion that the carrying capacity of Shenyang Dalian highway is more than the freight demand for the development of high-tech industry belt in central and southern Liaoning province.

In the study "A Range-Based Three Dimensional Node Self-Localization Algorithm for Wireless Sensor Network", the node localization technology is one of the key technologies in wireless sensor network. Considering the following problems that most of existing localization algorithms are based on the two dimensional environment, and the error in the multi-hop ranging is easy to accumulate, a range-based three dimensional nodes self-localization algorithm is presented in this paper. First, based on the topological

relation between the anchor nodes and the unknown nodes in the three dimensions, the basic principle and calculation process of the node self-localization algorithm are described. On this basis, the procedure of the localization algorithm is given. In addition, the two-hop ranging method is introduced, which can effectively reduce the error accumulation caused in the calculation of the node coordinates.

In the article "An Improved PSO-GA Hybrid Algorithm Based on P Systems for Data Clustering", clustering is the process of grouping a series of data objects into multiple groups or clusters so that intra-cluster data are similar and inter-cluster data are dissimilar. It is widely used in many fields, such as machine learning, image pattern recognition, and so on. K-means clustering is one of the most widely-used clustering methods. But its random choice of initial cluster centers may lead to trapping into the local optimum and attaining unstable clustering results. For this problem, P systems is introduced into a modified evolutionary algorithm which combines particle swarm optimization with an improved genetics algorithm (PGHAPS) in this paper. On account of the maximal parallelism feature and the communication rules of P systems, the PGHAPS algorithm owns better global search power and convergence capacity. This algorithm is then applied to improve K-means algorithm by optimizing the initial cluster centers (PGHAPS-K-means).

The study entitled "Locality Preserving Canonical Correlation Analysis Distributed Localization Algorithm for Wireless Sensor Networks" states that localization is essential for wireless sensor networks. The state-of-the-art methods mainly adopt low accurate signal strength to perform localization, which are suffering from low localization accuracy and high variance. The machine learning methods are introduced to confront the low data quality challenges and provide considerable localization accuracy and other advantages. However, these series of methods also bear some drawbacks such as high training cost and high energy consumption. To this end, learning from our previous algorithm LE-LPCCA (Location Estimation-Locality Preserving-Canonical Correlation Analysis), they proposed an improved version, called, LE-DLPCCA (LE-Distributed-LPCCA), which greatly reduces the training cost and energy consumption. Specifically, LE-DLPCCA employs a clustering algorithm based on energy equilibrium. The training process, which maps the signal space into physical space, is conducted in a distributed manner for each cluster. Then, in the positioning phase, the unknown node estimates the distances from the most similar anchor nodes through the mapping and perform the localization of the unknown nodes through the maximum likelihood method. Demonstrated by multiple simulations, LE-DLPCCA algorithm is in high accuracy, fast localization model efficiency and low average energy consumption.

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