Guest Editorial

Advanced Algorithms and Techniques for Certain Engineering Applications Such as Satellite Communication, Anisotropic and Complex Networks, Machinery Systems and Computing Platforms

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Nowadays, engineering applications with advanced algorithms and newly emerged techniques are more significantly disposable to faster and automatic processing demand. Recently, modification of current algorithms or unity of novel algorithms provide advanced algorithms and developed techniques. Basically, no algorithm can accomplish the best in all engineering applications. Thus, in order to provide a better solution and compare miscellaneous methods, research efforts are required. Researchers aim at searching the optimum solution in order to gain the best in good processing power required for the engineering systems.

This special issue is on *"Advanced Algorithms and Techniques for Certain Engineering Applications Such As Satellite Communication, Anisotropic and Complex Networks, Machinery Systems And Computing Platforms"* for *Journal of Internet Technology*. It contains the selected six papers from the 8th International Conference on Electronics, Communications and Networks (CECNet2018). CECNet2018 will be held in conjunction with the 4th International Conference on Fuzzy System and Data Mining (FSDM2018) in Bangkok during November 16th-19th, 2018. CECNet2018 is one of the leading international conferences for providing a comprehensive global forum for experts and participants from academia to exchange ideas and present results of ongoing research in the most state-of-the-art areas of electronics technology, communication engineering and technology, wireless communications engineering and technology, computer engineering and technology. In the following, summary has been given for each of the selected papers. Readers are suggested to download the full manuscript for detailed understanding.

The **first paper** 'Intelligent Recognition of Subcarrier for Wireless Link of Satellite Communication' is written by Mingxiang Guan and Le Wang and deals with combining wavelet multi-resolution analysis and Fourier transform and proposed an adaptive separation algorithm for subcarrier signals with uncertain signal number and bandwidth and non-overlapped frequency spectra of mixed signals. A simple and effective estimation algorithm for subcarrier frequency was proposed and the code rate was estimated based on the instantaneous characteristics of the modulated signal through analysis. Using the proposed adaptive separation and recognition method, multiple signals can be effective separated from the mixed signal, with high precision and strong noise immunity according to the results. This paper is qualified because developed an adaptive separation algorithm for subcarrier separation by combining wavelet multi-resolution analysis and Fourier transform is developed by this paper.

The **paper number two** is entitled 'Structural and State Controllability Study of the Supply Chain Network Based on the Complex Network Theory' co-authored by Bing Yang, Ming-hua Hu, Gang Zhao, Ying-bao Yang. The contributions of this paper are that based on the complex network theory, the state and structural controllability conditions of complex supply chain network (SCN) are analyzed in detail. The criterion for the state controllability of SCN is introduced, and the method for estimating the minimum number of control inputs for achieving the complete state/ global structural controllability is proposed. The proposed criterion can effectively assess the global controllability of SCN, while the introduced method can effectively determine the minimum number of control inputs for the global controllability of SCN. The respective theorem and its proof presented in this study yielded a quite unexpected corollary: it is not necessary to control the inputs of core enterprises in SCN, to achieve the complete state controllability on the global scale. This paper is qualified since the control of agricultural SCN is quite problematic, and the strengthening of ties between planting households (or enterprises) or increasing the scale of planting households (or enterprises) is lucrative for the improved controllability of SCN.

Manuscript entitled 'Research of Improved Artificial Fish Swarm Portfolio Optimization Algorithm Based on Adaptive Levy Mutation' is included as the **third paper** co-authored by Liyi Zhang, Xiufei Zhou, Teng

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Fei. The contributions of this paper are that this paper puts forward a new idea of improvement, which combines the Levy mutation with the artificial fish swarm algorithm so that improve the convergence precision of the algorithm. Then the average visual field and step size are used into the cluster and following behavior , while the foraging behavior adopt adaptive visual field and step size that contain optimal and recent distance of artificial fish. The results of solving five classical test functions show that the improved algorithm has better optimization performance. Finally, the improved algorithm is used to solve the portfolio model, the effect is better, while the investment income increased significantly and the risk has been effectively controlled at the same time. This paper is qualified because this paper combine basic artificial fish swarm algorithm with Levy mutation. Computer simulation shows the improved algorithm has better convergent performance, and the improved algorithm is used to solve the investment portfolio model. Experimental results show that the income is increased, and the risk is reduced.

The **paper number four** "Research on Trajectory and Modeling of Body Movement", is written by Biyuan Yao, Jianhua Yin, Guiqing Li, Hui Zhou and Lixin Liu. The contributions of this paper are that ten kinds of movement experiments are studied in nine parts of 10 individuals in normal and active states. Furthermore, the change of displacement of time series in action is taken as the characteristic model of body movement. The feature vectors are extracted by regression analysis, and the feature vectors are extracted to represent an action class. An action class is represented by a feature vector, which reduces the complexity of the data and improves the efficiency. The recognition of body movement is realized through the trajectory of human motion and the equation of movement. This paper is qualified because body movement analysis and identification are difficult and complex areas, and also this work is supported by National Natural Science Foundation of China.

The **fifth paper** "A new multi-hop localization based on ℓ_2 constraint least square for anisotropic networks", written by Bo Hu, Sainan Zhang and Zhenyan Yuan, proposes proposes a range-free localization method ML-ℓ_2CLS, which can be used to build the hops-physical distance relationship model with ℓ_2CLS. The algorithm standardizes the hops and physical distance to prevent the order of magnitudes problem during the conversion process. Then, the algorithm prevents the over-fitting problem during the model building process by restricting the hops scale, and in this way, it can control the complexity and improve the generalization ability of the model. The algorithm has also obtained the optimal value of Lagrange multiplier with the GCV method to improve the algorithm's localization accuracy. The ML-ℓ_2CLS

method proposed in this paper has good localization performance and strong adaptability. This paper is qualified because this paper uses the ℓ_2 constraint least square to build a mapping relationship that represents the anisotropy of a network based on anchors in order to improve the performance of multi-hop localization in anisotropic networks.

Guest Editors

Özlem Boydak was born in Turkey. She was graduated from both Mechanical Engineering and Electrical Engineering from Yildiz Technical University in Istanbul in 2004. She gained her master's degree from Mechanical Engineering department of Bogazici University, which is one of the best universities of Turkey. Now, she is a phD candidate of Mechanical Engineering at Marmara University in Istanbul and she is also an academician at Istanbul Medeniyet University. She also worked as R&D engineer at international companies previously. She has many international publications. She serves as a reviewer for many international journal and conferences. Her research interests include energy, energy production cycles, rankine cycle, renewable energy, production of electricity, product development and manufacturing methods.

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