

Guest Editorial: Special Issue on “Sustainability in Electrical Engineering and Renewable Energy”

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The rapid development of engineering field and information technology over the last few decades has brought about dramatic changes in people's way of thinking and life. Technologies that promote sustainable energy include renewable energy sources, such as wave power, solar energy, bioenergy, hydroelectricity, geothermal energy, wind energy were designed in order to improve energy efficiency. This special issue facilitates the exchange of new knowledge in the areas of sustainable technology and its environmental impact. The goal is to provide opportunities that have the potential to significantly improve the infrastructure and capacity to implement arts, science and technology for sustainability. This special issue is to publish selected 5 high-quality articles from CECNet2021 which entitled as 1. Improved Artificial Bee Colony Algorithm Based on Harris Hawks Optimization by Liyi Zhang, Zuo Chen Ren, Ting Liu, Jinyan Tang. 2. Vibrational Bruise Prediction Of Harvested Kiwifruits Under Transportation Based On The BP Neural Network by Shujie Song, Xue Huang, Yuchi Li. 3. Detection Method of Photovoltaic Panel Defect Based on Improved Mask R-CNN by Shuqiang Guo, Zhiheng Wang, Yue Lou, Xianjin Li, Huanqiang Lin. 4. Development and Practice of Mobile Internet Experimental Platform System by Yiqin Bao, Hao Zheng, Qiang Zhao and lastly 5. Network Representation Learning Algorithm Based on Community Folding by Dongming Chen, Mingshuo Nie, Jiarui Yan, Jiangnan Meng, Dongqi Wang.

First Paper: Artificial bee colony algorithm, as a kind of bio-like intelligent algorithm. However, it is low convergence accuracy, slow convergence speed, and not easy to jump out of the local optimum. This paper proposes improved artificial bee colony algorithm based on reverse learning Harris Hawk (HABC). The Harris Hawks optimization progressive rapid dives stage in the onlooker bee phase can speed up the algorithm convergence; Secondly, Cauchy reverse learning is added in the scout phase to make the algorithm development more promising areas. Finally, 13 standard test functions and CEC-C06 2019 benchmark are used to test the proposed HABC algorithm. Compared with other algorithms, the convergence speed, optimization accuracy and algorithm success rate of the HABC algorithm are relatively excellent.

Second paper: Vibrational bruise is common mechanical damages of fruit under transportation. Transportation vibrational bruise prediction can reduce the bruise and package design. In this study, a vibrational bruise prediction model based on BP neural network was established to predict vibrational bruise of harvested kiwifruit. Results showed that neural network model has good prediction effect of vibrational

bruise deformation and the average relative error of predicting vibrational bruise of kiwifruit is 1.32%, the average absolute error was 0.01 and R2 is 0.9683.

Third paper: This paper presented to solve the low efficiency and accuracy of uncrewed inspection in photovoltaic power stations. A segmentation method of improving the defective photovoltaic panels based on improved Mask R-CNN is proposed. The atrous spatial pyramid pooling and spatial attention mechanism were introduced into the extraction network to improve detection accuracy. Uncrewed aerial vehicle infrared video of the panels is used to input the network model for defect detection. As a result, the automatic annotation of the defect position is achieved, significantly improving the efficiency and accuracy of uncrewed inspection. The experimental results show that its accuracy is improved by 6.4% to be applied to the actual detection engineering.

Fourth paper: Nowadays, mobile Internet technology involves almost all knowledge points in the technology application. The traditional Internet of things has limited functions, which cannot meet the experimental requirements of mobile Internet. Due to this, a set of mobile Internet experimental platform system is designed. It's built according to three levels of perception layer, transmission layer and application layer, using ZigBee, Modbus, MQTT. Through the design of 21 experimental projects, the system practice shows that compared with before the platform is implemented, it improves the teaching level of students' mastery of mobile Internet technology, and achieves a good purpose of experimental teaching.

Fifth paper: Network representation learning is a machine learning method that maps network topology and node information into low-dimensional vector space. This paper addresses the problem that neighbourhood information-based network representation learning algorithm ignores the global topological information of the network. It proposes the Network Representation Learning Algorithm Based on Community Folding (CF-NRL). Each community of the target network is regarded as a folding unit, the same network representation learning algorithm is used to learn the vector representation of the nodes on the folding network, the target network. The vector representations are spliced correspondingly to obtain the final vector representation of the node. Experimental results show the excellent performance of the proposed algorithm.

Guest Editors



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