

Guest Editorial:

Recent Advances in Specific Applications of Communication, Computer Vision, and Networks

Raveendra K, He Xiao, Kang Chia Chao

Communication, Computer Vision and Networks are the attracting areas to apply the specific applications for enabling the recent technological advancements taking place in present world of technology. Communication especially wireless communication is must for the present days to interact with the globally spreading systems of various types. Computer vision plays its automation related role to make the difficult tasks in a very easiest way and The Networks will acts as an intermediate role to have the fruits of both Communication and Computer vision. All the Technocrats, Researchers and Engineers are applying their specific task based applications and they are making the solutions for global tasks with good efficient systems. Recent developments taken place in the era of communication throughout the globe are very attracting and remarkable. This was made possible due to the achievements and enhancements in new fields like Artificial Intelligence, Machine learning, Deep Learning, 5G and Big data analytics along with the rapid developments in electronics and information technology. With these tremendous happenings in the communication technology will definitely create a platform to fulfil our further dreams to reach our information up to Chandra Mandala also.

The main purpose of this special issue is to publish selected high standard and worthy papers from the special issue for Journal of Internet Technology, which entitled “Recent Advances in Specific Applications of Communication, Computer Vision, and Networks”, collects five selected articles from the tenth International Conference on Electronics, Communications and Networks (CECNet2020). CECNet2020 has been held successfully online via Microsoft Teams, during October 25-28, 2020. And hence to solve our dreams to come practical solutions and also to face the challenges of the present internet technology Passionate. This special issue will also provide a great media to all the academicians, Industrialists and researchers to share all their views and concepts throughout the enthusiastic technology globalists by selecting the five top class worthy papers entitled as 1. ‘Node Similarity Index and Community Identification in Bipartite Networks’ is presented by Dongqi Wang, Mingshuo Nie, Dongming Chen, Li Wan and Xinyu Huang. 2. ‘Location selection strategy of distribution centers based on Artificial Fish

Swarm Algorithm Improved by Bacterial Colony Chemotaxis’ is brought by Teng Fei, Liyi Zhang, Xiaoqin Zhang, Qi Chen, Jingyi Liang. 3. ‘Psychological Factors in Consumer Acceptance of Artificial Intelligence in Leisure Economy: A Structural Equation Model’, and it is authored by Xuelin Xian. 4. ‘A static gesture recognition method based on improved SURF algorithm and Bayesian regularization BP neural network’ is co-authored by Hongji Xu, Haibo Cao. And 5. ‘Research on Underwater Noise Features Based on Spectrum Analysis and Welch Algorithm’ authored by Hui Zhou, Biyuan Yao, Kun Ye, Guiqing Li, Jin Guo.

These five papers were selected for the publication as these are fulfilling the required measures for publication in all respects.

First Paper:

Bipartite networks or affiliation networks are a particular class of complex networks. It comprises two types of nodes, and only edges between the nodes of different types are allowed. The bipartite network model is a natural representation of the relationships between diverse entities. Most of the traditional complex network research, such as community detection and link prediction, focus primarily on a single network, so research on bipartite networks is particularly necessary. In this paper, a novel DA similarity is proposed to measure the similarity between nodes, which takes both the influence of nodes and neighbourhood structure information of nodes into consideration. Based on the DA similarity index, a community detection algorithm for bipartite networks (i.e., CDBNS algorithm), is firstly proposed. The experimental results show that DA similarity is superior to traditional similarity indices, and the CDBNS algorithm has an excellent performance in modularity and time-consuming. Furthermore, the authors employ the CDBNS algorithm in recommendation missions and propose a recommendation algorithm called RASCS, which calculates the node similarity of each community detected by CDBNS and incorporates user-based collaborative filtering to achieve recommendation. It is also verified by experiments on several real-world datasets that the RASCS algorithm outperforms some baselines, such as RACD, Item Based CF, and User Based CF algorithms.

This paper proposes a measure index of node similarity (DA similarity index) for bipartite networks, which incorporates the influence of the degree of two types of nodes as well as the influence of the common neighbours of two types of nodes on the similarity calculation. Furthermore, a community detection algorithm based on the DA similarity index for bipartite networks (CDBNS algorithm) is proposed, which is parameter-free and does not extract the maximal connectivity sub graph of bipartite networks. It only measures the similarity between nodes to identify the Communities, and merges the nodes with the maximum similarity into the same community. Sequentially, combining the CDBNS algorithm and user-based collaborative filtering algorithm, the method of calculating user attribute similarity is designed, and a new recommendation algorithm (RASCS algorithm) is proposed. Finally, the DA similarity index, CDBNS algorithm, and RASCS algorithm are verified by experiments and compared with typical traditional methods. The experimental results show that the DA similarity index is reasonable and effective, CDBNS algorithm and RASCS algorithm outperform classical algorithms.

Second paper:

The distribution center (DC) is crucial in the connection between the suppliers and customers, thus the strategy for the selection and optimization of distribution centre location plays an important role in logistics systems. In order to minimize the total cost, a distribution center location model with the lowest total cost is established. Accordingly, a distribution center location strategy based on artificial fish swarm algorithm improved by bacterial colony chemo taxis (BCC-AFSA) is proposed aiming to obtain a more feasible distribution center location strategy promptly. The algorithm of BCC- AFSA applies bacterial colony chemo taxis (BCC) to artificial fish swarm algorithm (AFSA) when the results do not change or change infinitesimally after multiple iterations. As result, the global optimization ability of the algorithm is improved. Through algorithm tests and example simulation, it is shown that the improved BCC- AFSA is more effective in the location selection strategy of distribution centers.

First of all, this paper introduces the significance of the study of location problem, and on this basis, it summarizes the literature of location problem in the second part. The third part introduces the basic fish swarm algorithm model, the fourth part establishes the location model of distribution center, the fifth part introduces the artificial fish swarm algorithm improved by bacterial colony chemo taxis algorithm, the sixth part uses the improved fish swarm algorithm to solve the model, and the seventh part tests and simulates the improved algorithm. In the article, a location selection strategy of distribution centers in logistics systems based on BCC- AFSA is established. In order to solve

the problems such as falling into local optima easily and poor convergence accuracy, BCC is applied to the original algorithm, which enhances the global search ability and improves the convergence speed as well as the convergence accuracy. The effectiveness of the original algorithm is verified by comparing the test functions. Finally, the BCC-AFSA is adopted to optimize the location selection model of logistics distribution centers. The simulations indicate that BCC-AFSA can reduce the total cost remarkably, at the same time 'select the feasible distribution centers rapidly can be reduced as well. However, the proposed primary algorithm is in the preliminary research, and thus further research is still required. In addition, the location selection model of distribution centers is inaccessible to completely simulate the practical situation and therefore remains in the initialization phase. Therefore, the model construction for more practical situation is an essential research direction in our further research.

Third paper:

In global economics, Artificial Intelligence (AI) developed rapidly along with mobile internet, big data and sensor network. Technology becomes a key segment of an innovation system that affects global tourism. To analyze the pattern of technology in tourism leisure economy is to determine the critical mechanism of the innovation network in global tourism. This paper examines the psychological factors affecting the adoption of AI in leisure economy by individual consumers. 560 valid Data was analyzed via structural equation modelling. Based on the study results, expected performance of AI, social circle, facilitating conditions, pleasure derived from using AI, price value, and user habit significantly influence AI adoption. And Personal Innovativeness is verified as a new factor in the integrated research model. This study contributes to the explanation of the determinants in AI acceptance and provides an insight for AI manufacturers or leisure industries to better understand consumer behaviours.

According to the Smart PLS results, the P- values of six constructs are less than 0.05, meaning PE, FC, SI, PV, HM and HB have significant influence on BI. Thus, except H2, all the other Hypothesis 1, 3, 4, 5, 6 and 7 are supported.

Fourth paper:

Gesture recognition plays an important role in the aspect of human-computer interaction (HCI). It has become one of the most challenging tasks in the pattern recognition field. So far, many gesture representations using two-dimensional image have been proposed, but normally they are vulnerable to environment factors, such as illumination, cluttered backgrounds and so on. In this paper, The authors propose a static gesture recognition method based on the improved speed up robust feature (SURF) algorithm and Bayesian regularization BP neural network with Microsoft

Kinect sensor. With the advantages of the Kinect, Authors captured the depth data to enhance the robustness of the proposed algorithm. Gesture analysis can be viewed as a two-fold problem, i.e., gesture representation and classification. On the one hand, they implemented gesture segmentation by the depth data, and then extract the feature descriptor of the gesture based on the improved SURF algorithm which is optimized through the key point detection and orientation calculation. On the other hand, the method based on Bayesian regularization BP neural network is used as classifier. Subsequently, in order to further intensify the recognition rate, another method of classification of gestures based on maximum angle between fingers is proposed as well. Finally, two kinds of classification results are also combined to get the final classification result. The experimental results show that the proposed method can eliminate the interference of the background, and enhance the robustness and accuracy of the gesture recognition.

In this paper authors propose a static gesture recognition method based on the depth data captured by Kinect which can overcome some kinds of interference of illumination and background. To improve the efficiency, they optimize SURF algorithm through key point detection and calculation of orientation, and these gestures are classified by Bayesian regularization BP Neural Network and the proposed classification method based on maximum angle between the fingers, and then two kinds of classification results are combined to get the optimal output. The experiments show that the proposed method has a better performance than the compared one and can enhance the robustness and accuracy of gesture recognition. However, for some very similar gestures, the accuracy of recognition is still not very high. In addition, with the development of the convolutional neural network (CNN), it can bring very good performance and very high accuracy. But it normally needs to be supported by very expensive computing equipment and resources, like high performance GPU and so on, and it usually cannot execute on the platform of minicomputer or embedded computer. For the future work, authors plan to combine the feature level fusion and decision level fusion, and also try to use some state-of-the-art neural network techniques to further optimize the system performance.

Fifth paper:

In order to study the characteristics of underwater noise, according to the 5-day noise data which obtained by the root mean square data, sequence diagram, periodic diagram, density diagram and the improved

Welch algorithm are used to analyze the power spectrum and frequency of underwater noise. The study shows that the power spectrum estimation obtained by Welch algorithm is smoother and closer to theoretical analysis than period gram and density graph.

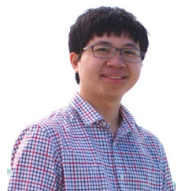
The periodogram method estimates the frequency by searching the power spectrum peaks of the signal without calculating the autocorrelation function, which is simple to achieve and has stable performance. But its performance is affected by noise frequency resolution and random errors. Segmentation process of the Welch algorithm reduces the resolution of the noise frequency and the random error, which has a higher algorithm complexity than the periodogram method. When the total amount of data becomes larger, the simulation effect obtained by the welch algorithm is more accurate than the result of the periodogram method.

Guest Editors



Raveendra K has finished his Bachelor of Technology in SRKR Engineering College, Andhra University, Bhimavaram and Master of Technology in Jawaharlal Nehru Technological University (JNTU) College of Engineering, Kakainada.

And Research at Koneru Lakshmaiah Educational Foundation, Vijayawada, Andhra Pradesh, India. He is working as Associate Professor in the Department of Electronics and Communication Engineering and Officer In-Charge Examination Section, Sri Venkateswara Engineering College, Tirupati, Andhra Pradesh. He has published nine papers in international journals and two papers in national journals. He is a life member of ISTE and ISOI. He has total teaching experience of 19 years. His research interest includes image processing, biomedical imaging, ocean exploration, machine learning and deep learning. E-mail: raveendrasvew@gmail.com



He Xiao graduated from Georgia Institute of Technology and his Ph.D. research focused on characterizing and simulating the physical effects on multi-core microarchitectures using 3DIC technology, as well as exploring adaptive architectures based on the

Multiphysics analysis. His research interests include computer architecture, low power design, programming models and compiler optimization. E-mail: xiheasas@gmail.com



Kang Chia Chao is currently a senior lecturer at Xiamen University Malaysia. He is a registered Graduate Engineer under Board of Engineering Malaysia (BEM), member of Malaysian Society of Engineering Technology (MySET), Professional Technologists of Malaysia

Board of Technologists and member of Institute of Electrical and Electronic Engineering and Technology (IEEE). He received his Bachelor of Electrical & Electronic Engineering at Northumbria University in Newcastle upon Tyne, Master of Science in Electronic System Design Engineering and Doctor of Philosophy in Microwave and System Satellite at Universiti Sains Malaysia. He has several years of industrial working experience prior joining as academician. His research interest is renewable energy, antenna, power electronics. E-mail: wattkang@yahoo.com.hk