EDITORIAL

JOURNAL OF INFORMATION PROCESSING SYSTEMS JIPS

Advanced Data Processing, Optimization & Software Engineering

Young-Sik Jeong* and Jong Hyuk Park**

Executive Editor and Editor-in-Chief, *JIPS*

1. Introduction

The *Journal of Information Processing Systems* (*JIPS*) is the journal published by the Korean Information Processing Society (KIPS), which has indices such as ESCI, SCOPUS, EI-COMPENDEX, DOI, DBLP, EBSCO, and Google Scholar. The research on Computer System and Theory, Multimedia Systems and Graphics, Communication Systems and Security, and Information Systems and Application is introduced. Especially, JIPS contains diverse kinds of hot issues related to the research topics of artificial intelligence, network, database, security, and so forth.

This issue includes 17 peer-reviewed papers that propose novel algorithms, processes, and frameworks in the fields of network, artificial intelligence, person identification, image processing, software & system architectures, Internet of Things, and so on.

2. Related Works

In this section, diverse kinds of algorithms, processes, and frameworks for user-oriented applications are introduced as regular papers published by JIPS.

Chu and Jin [1] provide the delay partial differential equation with constant coefficients under three dimensions. They established the alternating direction difference scheme. They also give the expression of difference scheme truncation errors for time delay partial differential equation with constant coefficients from extended to three-dimensional. This paper shows that this method is simple, easy, and compact by analyzing the effectiveness of the proposed format through the corresponding numerical example.

Lotfi and Benyettou [2] propose a new cross-validation probabilistic neural networks algorithm for various benchmarking databases. This algorithm reduces the hidden layer's size and voids over-fitting at the same time. The proposed algorithm can be used for various and huge datasets. In this paper, the authors show that this algorithm has better processing speed, fewer hidden layers, and better

Corresponding Author: Jong Hyuk Park (jhpark1@seoultech.ac.kr)
* Dept. of Multimedia Engineering, Dongguk University-Seoul, Seoul, Korea (ysjeong@dongguk.edu)
** Dept. of Computer Science and Engineering, Seoul National University of Science & Technology (SeoulTech), Seoul, Korea (jhpark1@seoultech.ac.kr), http://www.parkjonghyuk.net

generalization of the network than the standard PNN.

Lee et al. [3] propose a group order-preserving data encryption scheme to overcome the limitation of POPIS in case of order matching attacks and data count attacks. It can support efficient query processing, preserve the order of each data group, and also protect data from both order matching attacks and count attacks by generating the signature and data transformation of the encrypted data. The proposed scheme achieved higher degree of data privacy protection than the existing POPIS.

Chu and Zhu [4] present a vibrotactile reading system for mobile phones for new vibrotactile codes utilizing known index characters. In this study, two user experiments were conducted to improve the speed and accuracy of user perception, and vibrotactile codes and reading system prototype were then designed. The evaluation test shows that this method is better than traditional encoding methods.

Kundu and Sarker [5] propose a multi-level integrator with programming-based boosting to build highly secure systems for person authentication using different biometrics. The system consists of single classifiers, super-classifiers, and mega-super-classifier. It uses accuracy, precision, recall, and f-score metrics through the holdout method and confusion matrix for each of the single classifiers, super-classifiers, and mega-super-classifier to evaluate performance. The evaluation results show that the proposed system is more accurate and efficient than conventional systems.

Tong et al. [6] conduct power cable ampacity and influential factors analysis under operation for safe cable operation. In this paper, the authors calculate the diverse steady-state ampacity under different actual circumstances and use the control variety method to discuss the rank of influence of various factors related to the ampacity by specific quantitative data. As a result, this paper shows that this method can effectively improve cable utilization and solve the short-time overload or short circuit fault that happens in various cases.

Lee and Lee [7] present a physical storage design method for image access structures using transformation techniques of multidimensional file organizations in image information systems to provide optimal query processing performance for a given set of queries. This method improves the search query performance by up to 5 times compared with the existing storage structure.

Aydadenta and Adiwijaya [8] propose a clustering approach for feature selection that removes the redundancy in microarray data classification using random forest. This method offers higher accuracy than the approach using random forest without clustering for each dataset, namely Colon, Lung Cancer, and Prostate Tumor.

Aamir et al. [9] introduce a hybrid proposed framework for object detection and classification using an enhanced bag of words. This approach provides a description of the features of the image by measuring the similarity between the image features using the VLFeat linear SVM classifier. The experiment results show that this method is much more efficient than a conventional approach.

Chantrapornchai et al. [10] present a prototype system to search images using the semantic web concept to enhance the performance of search engines. The authors build images and tourism corpus, create ontologies, and develop search engines. The evaluation methods use the precision and recall of the prototype system. The experiment results show that this methodology is efficient and highly satisfactory to the user.

Liu [11] proposes a novel correlation coefficient of interval-valued neutrosophic hesitant fuzzy set (IVNHFS). A method of dealing with multi-attribute decision making (MADM) problems within the framework of IVNHFS is developed based on the novel correlation coefficient. To verify the feasibility of the developed MADM method, a practical numerical example is used.

Gong et al. [12] study a research on the design of a humane animal care system and propose a system that monitors whether the owners actually carry out the management of animals' safety and health. GPS and Bluetooth-based methods have been proposed to prevent loss of pets through simple operation.

Tian and Zhang [13] present an improved method of generating solutions in a genetic algorithm using harmony search algorithms. The experiment results show that the proposed improved harmony search algorithm is simple and easy to implement, and that it finds a better solution than the other algorithms more efficiently.

Batsuren et al. [14] propose two novel techniques on top of the state-of-the-art keyphrase extraction methods: the anti-patterns that aim to recognize non-keyphrase candidates and the dependency graph. The experiment results show that the combination method of dependency graph and anti-patterns outperforms the state-of-the-art methods.

Huang and Yin [15] present a novel embedded multifunctional media server (EMMS) for mobile devices to receive various media programs. The EMMS receives the terrestrial DTV radio signals and demodulate out digital TS or reads streaming media bit-stream from VOD disk, camera, and access interface to the Internet. The experiment results show that the proposed EMMS is stable and quality-efficient.

Lee et al. [16] propose an Internet of Things (IoT) system architecture that is configurable and applicable to firefighting and rescue in various disaster situations. This system renders increased adaptability and reusability to systems compared to existing approaches.

Hu and Feng [17] propose an improved multi-focus image fusion method that uses Lifting Stationary Wavelet Transform to obtain the initial fused image quickly. The experiment results show that the proposed algorithm can simplify the selection of fusion rules as well as overcome loss of definition, and it has validity.

3. Conclusion

This issue contained 17 novel and enhanced peer-reviewed papers from India, China, Korea, Algeria, Thailand, and Indonesia. We present diverse kinds of approaches to subjects, which tackle diverse kinds of research fields such as probabilistic neural networks, query processing of encrypted data, vibrotactile interface, person identification, physical storage design, feature selection in microarray data classification, object detection and classification, semantic web, decision-making, software engineering and so on. We would like to thank all authors who submitted their papers for this issue and all reviewers who accepted our review invitations.

References

[1] Q. Q. Chu and Y. Jin, "The three-dimensional partial differential equation with constant coefficients of time-delay of alternating direction implicit format," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1068-1074, 2018. https://doi.org/10.3745/JIPS.04.0094.
[2] A. Lotfi and A. Benyettou, "Cross-validation probabilistic neural network based face identification," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1075-1086, 2018. https://doi.org/10.3745/JIPS.04.0085.

[3]   H. Lee, Y. Song, and J. W. Chang, "GOPES: group order-preserving encryption scheme supporting query processing over encrypted data," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1087-1101, 2018. https://doi.org/10.3745/JIPS.01.0032.

[4]   S. Chu and K. Zhu, "Designing a vibrotactile reading system for mobile phones," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1102-1113, 2018. https://doi.org/10.3745/JIPS.02.0093.

[5]   S. Kundu and G. Sarker, "A multi-level integrator with programming based boosting for person authentication using different biometrics," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1114-1135, 2018. https://doi.org/10.3745/JIPS.02.0094.

[6]   Q. Tong, J. Qi, Y. Wang, L. Liang, X. Meng, and Q. Zhang, "Power cable ampacity and influential factors analysis under operation," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1136-1149, 2018. https://doi.org/10.3745/JIPS.04.0068.

[7]   J. A. Lee and J. H. Lee, "A physical storage design method for access structures of image information systems," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1150-1166, 2018. https://doi.org/10.3745/JIPS.04.0086.

[8]   H. Aydadenta and Adiwijaya, "A clustering approach for feature selection in microarray data classification using random forest," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1167-1175, 2018. https://doi.org/10.3745/JIPS.04.0087.

[9]   M. Aamir, Y. F. Pu, Z. Rahman, W. A. Abro, H. Naeem, F. Ullah, and A. M. Badr, "A hybrid proposed framework for object detection and classification," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1176-1194, 2018. https://doi.org/10.3745/JIPS.02.0095.

[10]   C. Chantrapornchai, N. Bunlaw, and C. Choksuchat, "Semantic image search: case study for western region tourism in Thailand," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1195-1214, 2018. https://doi.org/10.3745/JIPS.04.0088.

[11]   C. Liu, "Multi-attribute decision-making method applying a novel correlation coefficient of interval-valued neutrosophic hesitant fuzzy sets," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1215-1224, 2018. https://doi.org/10.3745/JIPS.04.0089.

[12]   H. S. Gong, S. Weon, and J. H. Huh, "A study on the design of humane animal care system and Java implementation," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1225-1236, 2018. https://doi.org/10.3745/JIPS.02.0096.

[13]   Z. Tian and C. Zhang, "An improved harmony search algorithm and its application in function optimization," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1237-1253, 2018. https://doi.org/10.3745/JIPS.04.0090.

[14]   K. Batsuren, E. Batbaatar, T. Munkhdalai, M. Li, O. E. Namsrai, and K. H. Ryu, "A dependency graph-based keyphrase extraction method using anti-patterns," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1254-1271, 2018. https://doi.org/10.3745/JIPS.04.0091.

[15]   J. Huang and H. Yin, "An embedded multifunctional media system for mobile devices in terrestrial DTV relaying," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1272-1285, 2018. https://doi.org/10.3745/JIPS.03.0100.

[16]   H. Lee, S. G. Hong, and K. B. Lee, "An internet of things system architecture for aiding firefighters in the scene of disaster," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1286-1292, 2018. https://doi.org/10.3745/JIPS.04.0092.

[17]   K. Hu and X. Feng, "Research on the multi-focus image fusion method based on the lifting stationary wavelet transform," *Journal of Information Processing Systems*, vol. 14, no. 5, pp. 1293-1300, 2018. https://doi.org/10.3745/JIPS.04.0093.

Young-Sik Jeong https://orcid.org/0000-0002-7421-1105

He is a professor in the Department of Multimedia Engineering at Dongguk University in Korea. His research interests include multimedia cloud computing, information security of cloud computing, mobile computing, IoT (Internet of Things), and wireless sensor network applications. He received his B.S. degree in Mathematics and his M.S. and Ph.D. degrees in Computer Science and Engineering from Korea University in Seoul, Korea in 1987, 1989, and 1993, respectively. He was a professor in the Department of Computer Engineering at Wonkwang University in Korea from 1993 to 2012. He worked and researched to Michigan State University and Wayne State University as visiting professor in 1997 and 2004, respectively. He is also an Executive Editor of *Journal of Information Processing Systems*, an Associate Editor of *Journal of Supercomputing* (JoS) and *International Journal of Communication Systems* (IJCS), and an Editor of *Journal of Internet Technology* (JIT), finally an Associate Editor of *Journal of Human-centric Computing* (HCIS). In addition, he has been serving as a Guest Editor for international journals by some publishers: Springer, Elsevier, John Wiley, Oxford University Press, Hindawi, Emerald, Inderscience, and so on. He is also a member of the IEEE.

James J. (Jong Hyuk) Park https://orcid.org/0000-0003-1831-0309

He received Ph.D. degrees in Graduate School of Information Security from Korea University, Korea and Graduate School of Human Sciences from Waseda University, Japan. From December 2002 to July 2007, Dr. Park had been a research scientist of R&D Institute, Hanwha S&C Co. Ltd., Korea. From September 2007 to August 2009, he had been a professor at the Department of Computer Science and Engineering, Kyungnam University, Korea. He is now a professor at the Department of Computer Science and Engineering and Department of Interdisciplinary Bio IT Materials, Seoul National University of Science and Technology (SeoulTech), Korea. Dr. Park has published about 200 research papers in international journals and conferences. He has been serving as chairs, program committee, or organizing committee chair for many international conferences and workshops. He is a founding steering chair of some international conferences—MUE, FutureTech, CSA, UCAWSN, etc. He is editor-in-chief of *Human-centric Computing and Information Sciences (HCIS)* by Springer, *The Journal of Information Processing Systems (JIPS)* by KIPS, and *Journal of Convergence (JoC)* by KIPS CSWRG. He is Associate Editor / Editor of 14 international journals including 8 journals indexed by SCI(E). In addition, he has been serving as a Guest Editor for international journals by some publishers: Springer, Elsevier, Wiley, Oxford University press, Hindawi, Emerald, Inderscience. His research interests include security and digital forensics, human-centric ubiquitous computing, context awareness, multimedia services, etc. He got the best paper awards from ISA-08 and ITCS-11 conferences and the outstanding leadership awards from IEEE HPCC-09, ICA3PP-10, IEE ISPA-11, and PDCAT-11. Furthermore, he got the outstanding research awards from the SeoulTech in 2014. Dr. Park's research interests include human-centric ubiquitous computing, vehicular cloud computing, information security, digital forensics, secure communications, multimedia computing, etc. He is a member of the IEEE, IEEE Computer Society, KIPS, and KMMS.