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GUEST EDITORIAL

Special Section Guest Editorial: Real-Time Image Steganography and Steganalysis

Shi Dong,[a] Stelvio Cimato,[b] Joarder Kamruzzaman,[c] and Yongsheng Hao[d]
[a]Zhoukou Normal University, School of Computer Science and Technology, Zhoukou, China
[b]Università degli studi di Milano, Department of Computer Science, Milano, Italy
[c]Federation University, Australia Department of Information Technology, Brisbane, Australia
[d]Nanjing University of Information Science & Technology, Nanjing, China

As an important branch of network security, image steganography has set off a research upsurge since it was proposed and plays an important role in all kinds of copyright protection. With social changes, the traditional way of hiding important information in the carrier at the cost of permanent distortion of the carrier can no longer meet more practical needs. For example, in medicine, it is necessary to ensure not only the security of information in the transmission process but also the lossless recovery of the carrier after the receiver extracts the hidden information. Similarly, in military, the security of the carrier information is much more important than the amount of information that can be embedded. With large data storage, cloud systems are also facing the challenges of ensuring data security and reversible information extraction. In addition, the massive spreading of harmful information will increase the difficulty of security management. To address the above, image steganalysis techniques are highly effective. Of particular interest here is the real-time image steganalysis when information timeline is of importance. Using new technologies such as deep learning and pattern recognition to improve the embedding rate and real-time steganalysis and to reduce time complexity are ongoing research challenges.

This special section is intended to serve as a forum to provide recent advances in real-time image steganography and steganalysis technology. The included papers cover exciting topics of image steganography and steganalysis, including novel algorithms and applications.

Lu and Su build a user-news interaction graph and then present the weight learning and preference decomposition (WLPD) news recommendation model for graph neural networks, which is based on WLPD. This model not only takes into account the impact of the relationship between news titles and content, both explicit and implicit, on the likelihood that users will click on the news but also considers various potential preferences between users and their interactions with the news.

Gottimukkala et al. put forward an image watermarking method for tamper detection and correction using remainder value differencing (RVD) and extended Hamming code (EHC). The efficacy of this technique is accessed through various quality metrics.

Hajjaji et al. present a hardware solution for securing digital information, specifically images. To ensure both a high level of security and favorable performance, they proposed a robust algorithm employing Shannon's theory and Chaos, and implemented it on hardware. The algorithm is a block cipher scheme that treats a block of 128-bit length.

Li, Kang, and Sakamoto propose a lossless data hiding technique focusing on cover data size. Due to its short processing time, this technology can be applied to real-time scenarios. Experimental results with MPEG-2 videos also show the technique's efficacy.

Shi Dong is a distinguished professor with Zhoukou Normal University. His current research interests include network management, network security, image steganography, and steganalysis. He has published more than 100 papers in top conferences and journals. He is a reviewer of *IEEE Transactions on Parallel and Distributed Systems*, *IEEE/ACM Transactions on Networking*, *IEEE Transactions on Neural Networks and Learning Systems*, *Computer Networks*, *IEEE Transactions on Network Science and Engineering*, *IEEE Transactions on Industrial Informatics*, *IEEE Internet of Things Journal*, *Information Processing & Management*, *Expert Systems With Applications*. He also is an associate editor for *IEEE Systems Journal, Physical Communication, PeerJ Computer Science, IEICE Transactions on Communications, Journal of Artificial Intelligence and Soft Computing Research, IET Wireless Sensor Systems, IET Networks*, and *International Journal on Artificial Intelligence Tools*. He had served as member of the program committee of several international conferences in the area of network and data security and as the lead guest editor of international journals.

Stelvio Cimato is an associate professor with the Dipartimento di Informatica of the Università degli Studi di Milano. He received a PhD in computer science at the University of Bologna, Italy, in 1999. His main research interests are in the area of cryptography, network security, and Web applications. He has published several papers in the field and is active in the community, serving as member of the program committee of several international conferences in the area of cryptography and data security.

Joarder Kamruzzaman is a professor of information technology and the director of the Centre for Smart Analytics at Federation University Australia. His interests include Internet of Things, machine learning, and cybersecurity. He has published 300+ peer-reviewed articles, which include over 90 journal and 180 conference papers. He is the recipient of best paper awards in four international conferences: ICICS'15, Singapore; APCC'14, Thailand; IEEE WCNC'10, Sydney, Australia, and IEEE-ICNN'03, Nanjing, China. He is the founding program co-chair of the First International Symposium on Dependability in Sensor, Cloud, and Big Data Systems and Applications (DependSys), China, in 2015. He has served many conferences in leadership capacities including program co-chair, publicity chair, track chair, and session chairs, and since 2012 as an editor of the Elsevier *Journal of Network and Computer Applications* and had served as the lead guest editor of Elsevier *Journal Future Generation Computer Systems*.

Yongsheng Hao is a senior engineer of Network Center, Nanjing University of Information Science & Technology, Nanjing, China. His current research interests include cloud computing, distributed and parallel computing, mobile computing, grid computing, web service, particle swarm optimization algorithm, and genetic algorithm. He has published more than 60 papers in international conferences and journals.