

GUEST EDITORIAL

RECENT ADVANCES IN INFORMATION SECURITY AND INFORMATION TECHNOLOGY

Recent years have witnessed rapid developments of the information communication technology and the next-generation Internet. We have seen the potential and value for new technologies from a variety of digital networks to various interconnected digital devices, which make it possible to realize the ubiquitous network and society. But, in such environment, copyright infringement behaviors, such as illicit copying, malicious distribution, unauthorized usage, and free sharing of copyright-protected digital contents, will also become a much more common phenomenon. Researchers, content industry engineers, and administrators attempt to resort to the state-of-the-art technologies and ideas to protect valuable digital contents and services assets against attacks and IP piracy in the emerging ubiquitous network.

This special issue aims to bring together related research works in the realm of ubiquitous network and multimedia contents security and further investigates and discusses trusted solutions and secure techniques for ubiquitous network as well as some open issues faced by digital contents, owners/rights, holders/multimedia, and services providers, who dedicate themselves to protect their intellectual property rights and business benefits.

In this section, thirteen papers have been selected for publication. All selected papers followed the same standard (peer-reviewed by at least three independent reviewers) as applied to regular submissions. They have been selected based on their quality and their relation to the scope of the special section.

In the paper entitled “SARSA Based Access Control with Approximation by TileCoding” by Fei Zhu et al., an efficient and feasible TileCoding reinforcement learning algorithm for access control is proposed, which provides a policy for sensor nodes in different complex situations.

The paper entitled “Research on Improved Privacy Publishing Algorithm Based on Set Cover” by Haoze Lv et al. proposes a marginal table cover algorithm based on frequent items by considering the effectiveness of query cover combination, and then obtain a regular marginal table cover set with smaller size but higher data availability.

A novel survivability entropy evaluation method is proposed in the paper entitled “A Novel SMP-based Survivability Evaluation Metric and Approach in Wireless Sensor Network” by Hongsong Chen et al. The method is aimed to precisely calculate the survivability ability under DoS flood attack in wireless sensor network.

In the paper entitled “A Framework for Fog-assisted Healthcare Monitoring” by Jianqiang Hu et al., a framework for fog-assisted healthcare monitoring is proposed. This framework is composite of the body-sensing layer, fog layer and cloud layer. The body sensing layer measures physiological signals and fog-assisted gateway collects these information.

The paper entitled “Design of Intrusion Detection System Based on Improved ABC_elite and BP Neural Networks” by Letian Duan et al. proposes an intrusion detection method based on improved artificial bee colony algorithm with elite-guided search equations (IABC_elite) and Backpropagation (BP) neural networks.

The paper entitled “Hierarchical Authority Based Weighted Attribute Encryption Scheme” Qiuting Tian et al. discusses a weighted attributed encryption scheme based on a hierarchical authority.

The study presented in the paper entitled “Algorithm of Web Page Similarity Comparison Based on Visual Block” by Xingchen Li et al. introduces a new similarity matching algorithm based on visual blocks. The proposed algorithm analyzes the RenderLayer tree of the web page, extracts visual information by making the matching rules, determines the feature sets of the visual blocks corresponding to a web page by processing the visual nodes, and obtains similarity matching in accordance with the optimal free matching principle.

The scheme proposed in the paper entitled “Privacy-preserving Multi-authority Attribute-based Encryption with Dynamic Policy Updating in PHR” by Xixi Yan et al. aims to construct the MA-ABE scheme for PHR scenario which has the requirement for privacy preserving and policy updating.

In order to study on learner’s state and its change, the Hidden Markov Model was applied in the paper entitled “Classification and analysis of MOOC Learner’s State: The study of Hidden Markov Model” by Haijian Chen et al. to analyze data about learners, which includes MOOCs learner’s basic information, learning behavior data, curriculum scores and data of participation in learning activities and so on.

Sensor networks will always suffer from load imbalance, which causes bottlenecks to the communication links. In order to address this problem, a multipath routing algorithm based on data-fusion-mechanism (MR-DFM) is proposed in the paper entitled “MR-DFM: A Multi-path Routing Algorithm Based on Data Fusion Mechanism in Sensor Networks” by Zeyu Sun et al.

The paper entitled “Research of MDCOP Mining Based on Time Aggregated Graph for Large Spatio-temporal Data Sets” by Zhanquan Wang et al. proposes the design and implementation of the prototype of PANBED, which builds a small-scale personal testbed for users utilizing devices in their own personal area networks (PANs). The experimental results show that PANBED allows users to set up different network scenes to test applications easily using a home router, PCs, mobile phones and other devices.

The paper entitled “A Novel Self-adaptive Grid-partitioning Noise Optimization Algorithm Based on Differential Privacy” by Zhaobin Liu et al. This article is based on application scenarios for the partition based data distribution algorithm. For the partition-based data distribution method, the authors first uniformly partitions the original spatial data, add a Laplace noise with uniform scale parameters, then select the set of grids to be optimized in a standard way based on the maximum ratio

between the value of overall error reduction and privacy budget increase value, and then operate noise optimized algorithm for the grid.

The paper entitled “Enhanced Artificial Bee Colony with Novel Search Strategy and Dynamic Parameter” by Zhenxin Du et al. describes a novel triangle search strategy to enhance the capability of escaping from local minimum without loss of the exploitation ability of ABC-BB.

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