

Editorial

Emerging services and technologies in wireless networks

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Wireless communication technologies have been characterized by an astonishing evolution process in the last years. In particular, the widespread deployment of various wireless communication infrastructures and systems has fostered the diffusion of innovative services strongly leveraging ubiquitous coverage and mobility technologies. To support the novel services mentioned above, a large number of new architectures, protocols, management and security paradigms/solutions for mobile wireless networks have been introduced, greatly increasing the heterogeneity of the networking and application-layer platforms that may be involved in modern wireless communication scenarios. Such evolution trend introduces an unprecedented flexibility to the delivery of new services, but also contributes to the revision of the architecture, model and performance of the existing ones.

In such a challenging and varied scenario, the main goal of this Special Issue is to present some recent research results in different areas related to the design and implementation of new wireless mobile services, ranging from service oriented protocols and interfaces, to security and routing services in cognitive radio and wireless sensor networks as well as to advanced network-based monitoring infrastructures.

Six papers have been selected, addressing several major topics related to advanced wireless mobile services. These papers have been selected by following a rigorous peer review process with the help of multiple reviewers. They cover several challenging issues in such specific scenario by presented some interesting solutions for several common problems.

The first work describes how, due to its convenience and flexibility, the web services paradigm has gained a lot of interest from industry. It allows the creation of interactive service-based applications by combining the functionality offered by different web services. In the paper entitled “A data extraction and layout generation framework for web service”, Wu Gui-Cheng and Yang Jie introduced a novel web service customization method with an enhanced user interface and layout model.

With the development of network technology, a huge number of hosts have been connected to the Internet. In order to protect useful information from attacking, in the paper entitled “Research and analysis on spatial adaptive strategy of End-hopping system”, Chunlei Zhao, Chengyi Xia and Chunfu Jia proposed a spatial adaptive strategy for End-hopping systems which is based on the study of attack–defense models and has been conceived as a combination of adaptive and End-hopping technologies. New services/facilities such as attack detection, feedback transmission and adaptive control are added to the original End-hopping system model.

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Monitoring and analyzing Internet traffic are the important foundations for guarding against cyber threats and ensuring quality of service (QoS) in large networks. In the paper “Identifying Internet background radiation traffic based on traffic source distribution”, Ruoyu Wang, Zhen Liu, Ming Tao and Ling Zhang presented a novel Internet Background Radiation (IBR) traffic identification method that is able to evaluate the certainty of traffic sources associated to a specific destination IP, in order to identify inactive IPs.

Wireless sensor networks (WSN) have received an increasing attention in recent years. Routing is one of the most important issues to be considered for a WSN. A distributed algorithm is proposed in the paper “Load balancing and data aggregation tree routing algorithm in wireless sensor networks” by Jing Zhang, Ting Yang and Chengli Zhao to ensure that the mean square deviation of the number of member nodes within each cluster is kept as small as possible.

Cognitive radio (CR) is a promising paradigm which can overcome the dilemma of spectrum scarcity. The paper entitled “Energy-aware resource allocation for cooperative cognitive radio dynamic spectrum access networks” by Xiaomao Chen, Shan Ouyang and Yong Ding developed a scheme which tries to minimize the power demand of primary users and maximize the throughput of secondary users.

Finally, Kai Wang, Hong Zhao, Yanan Ding, Tao Li, Lujian Hou and Fengjuan Sun proposed in their work “Optimization of air pollutant monitoring stations with constraints using genetic algorithm” a novel network-based framework for air quality monitoring stations (AQMS) that is very important for environmental protection. The powerful search capability of the genetic algorithm (GA) has been exploited for selecting optimal monitoring sites and to optimize the behavior of the overall AQMS system. This method/framework is also suitable for the design of communication networks.

In conclusion, we would like to express our thanks to the authors of the papers and to the reviewers who worked on this Special Issue. Also, we would like to thank Francesco Palmieri, the Editor-in-Chief for his assistance in editing this Special Issue.