Wireless Communications and Mobile Computing

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Special Issue on
Multiobjective Optimization Algorithms for Wireless Sensor Networks

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Wireless Sensor Networks (WSNs) have an ever-growing number of applications and are considered to be among the most significant technologies in the 21st century and the basis of the Internet of Everything. However, the development of WSNs faces many problems, due to both the restricted capabilities of sensor nodes in energy supply, memory and processing, and the inherent limitations of wireless communications. These are in terms of power, speed, and capacity of communication channels as well as resistance to interferences and intrusion detection and prevention to preserve data security. Consequently, the performance of any WSN relies on various metrics such as energy consumption, Quality-of-Service (QoS), sensors and network lifetime, connectivity, coverage, throughput, and the achieved security level.

Scientific literature is rich in terms of approaches that aim to optimize a specific set of these metrics; however, in real applications, a number of objectives that aim to optimize these metrics may conflict with each other. Thus, conventional single-objective optimization algorithms may be unsuitable for real applications, since they act to the detriment of the rest of the performance parameters. The development of multiobjective optimization algorithms which aim to simultaneously achieve various goals, subject to a set of constraints, in order to enhance the performance of WSNs is a critical challenge.

This special issue welcomes innovative research articles in multiobjective optimization algorithms which have been exclusively proposed for WSNs, in order to enhance the overall WSN performance.

Potential topics include but are not limited to the following:

- Minimization of network energy consumption
- Conservation of network connectivity
- Achievement of optimal rate allocation
- Minimization of the total number of nodes to be deployed
- Maximization of coverage given a specific number of sensor nodes
- Optimization of QoS
- Achievement of fair rate allocation
- Maximization of network lifetime
- Attainment of maximal network fault tolerance
- Minimization of network end-to-end latency
- Maximization of data security based on intrusion prevention and detection mechanisms

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