International Journal of Distributed Sensor Networks

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Special Issue on

# Computational Intelligence in Wireless Sensor and Ad Hoc Networks

# CALL FOR PAPERS

Wireless sensor and ad hoc networks have attracted a lot of attention in the last decades. They represent a new paradigm of communications where decentralized wireless nodes communicate with each other in a collaborative and self-organizational way to achieve a common goal. The ad hoc networking paradigm has evolved since its origin leading to different classes of networks such as MANETs (mobile ad hoc networks), VANETs (vehicular ad hoc networks), FANETS (flying ad hoc networks), WSNs (wireless sensor networks), WMNs (wireless mesh networks), and OppNets (opportunistic networks). A wide variety of solutions related to the performance, efficiency, and deployment of all these networks have been proposed considering also a large diversity of scenarios. However, finding an optimal solution to sensor and ad hoc network problems, such as coverage, deployment, routing, broadcasting, mobility, and energy consumption among others, is challenging due to the high variable conditions of these networks, together with the high number of variables involved and the mutual dependency of these variables.

Computational intelligence has been demonstrated to be highly useful in a large number of applications of many different domains such as design, engineering, multimedia, telecommunications, and bioinformatics. Modern technologies based on computational intelligence have also been applied in the field of ad hoc and sensor networks in the last few years. They can help to explore optimal solutions beyond the knowledge of researchers and intuitions or automatically learn the properties of the environment and adapt their behavior to the changing conditions. Examples of computational intelligence techniques that can be applied with success to enhance the performance of wireless and ad hoc networks are machine learning, clustering, expert systems, forecasting methods, swarm intelligence, or evolutionary computation, just to name a few.

The purpose of this special issue is to publish high quality research papers related to the applications of computational intelligence techniques to the optimization of wireless sensor and ad hoc networks.

Potential topics include, but are not limited to:

- Application of computational intelligence techniques to energy consumption optimization in wireless sensor and ad hoc networks
- Application of computational intelligence techniques to routing and broadcasting protocols in wireless sensor and ad hoc networks
- Optimized deployment and coverage of wireless sensor networks
- Self-adaptive wireless sensor and ad hoc networks using computational intelligence approaches
- Technologies complexity and computational issues, as well as prototype systems and real-world deployment experiences, in case of delay-tolerant, sensor, mobile social, and/or vehicular networks
- Analytic methods and modelling, simulation, and real implementations of optimization techniques for performance evaluation of wireless sensor and ad hoc networks
- Multiobjective optimization for wireless sensor and ad hoc networks
- Optimization of tactical movements of nodes in mobile scenarios such as rescue operations, evacuation routes, and military scenarios, among others
- Optimized security mechanisms for wireless sensor and ad hoc networks
- Optimization of protocols' configuration parameters for wireless sensor ad hoc networks
- Machine learning and reinforcement learning techniques for enhancing the performance of wireless sensor and ad hoc networks and autonomous intelligent systems
- Clustering algorithms, geometric graphs, and access control for wireless sensor and ad hoc networks
- Handling mobility in mobile social networks and mobile ad hoc computing platforms
- Genetic programming applied to wireless sensor and ad hoc networks

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