
Editorial

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Biographical notes: Maggie X. Cheng received a PhD in Computer Science from the University of Minnesota. She is currently an Assistant Professor in the Department of Computer Science at the University of Missouri at Rolla. Her research interests include wireless ad hoc and sensor networks, combinatorial optimisation in communication networks and biological systems.

Ding-Zhu Du received his PhD in 1985 from UC-Santa Barbara. He was a Computer Science Professor at the University of Minnesota and a Program Director at NSF from 2002 to 2005. Currently, he is a Professor in the Department of Computer Science at UT-Dallas and the Dean of Science at Xi'an Jiaotong University. His research interests include design and analysis of algorithms for combinatorial optimisation problems in communication networks and bioinformatics. He has published more than 140 journal papers and 10 written books. He is the Editor-in-Chief of *Journal of Combinatorial Optimisation* and book series on *Network Theory and Applications*.

Coverage is one of the most important performance measures of a sensor network. It is directly related to the surveillance capability and many other QoS performance in sensor networks. To highlight the most recent contributions in sensor network coverage research and further promote the research activity in sensor networks, we edited this special issue of *Coverage Problems in Sensor Networks*.

The Special Issue consists of contributions that address the fundamental issues related to coverage in sensor networks as well as the relation between coverage and other practical performance metrics such as delay and network lifetime. Papers selected in this issue focus on the mathematical modelling of coverage, sensor deployment and scheduling techniques to achieve the required coverage and the solution methods to optimise other network performance while meeting the coverage requirements.

A study by Koutsougeras et al. addressed the event-driven coverage problem and provided methods of deploying sensors to minimise coverage divergence when the probability density function of events is given; Akkaya and Younis studied how to deploy actor nodes to maximise coverage area and minimise data collection

delay in Wireless Sensor and Actor Networks (WSANs), where more capable actor nodes are available; Wang and Zhong provided solutions for a very practical problem – to find a sensor arrangement to achieve the required coverage duration such that the total cost of sensors is minimum. Beyer et al. addressed how to select n distinct 1-covers while maximising n and minimising both the time taken and the messages passed in a distributed environment; Mihaela and Ionut Cardei studied the connected coverage problem with an objective of maximising network lifetime while targets are continuously observed and the active sensors each have a connected path to the base station; Finally, a survey of sensor coverage problems is given by Thai et al. The scope of this survey includes variations of the sensor coverage problem with a common objective of maximising network lifetime and different requirements/constraints on network connectivity, channel bandwidth and fault tolerance.

We would like to sincerely thank the authors, the anonymous referees and the Editor-in-Chief Dr. Xiao for providing the opportunity of editing a Special Issue on coverage problems in sensor networks, and the staff in editorial office to help publishing this issue.