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1 Abstract of the original proposal

Sensor networks are a new paradigm of wireless networks in which each wireless node is equipped with a low cost microprocessor as well as a simple sensor. As a result, each node has some sensing and computation capabilities. Unlike other wireless networks such as ad hoc networks, sensors networks have a stringent requirement on energy efficiency. For such reason, protocols used in other wireless networks are almost unsuitable for sensor networks; new protocols must be designed to take their particularities into consideration. Thus, we propose to perform theoretical analysis on the topology of the sensor network, and hopefully we can design more efficient protocols by taking advantages of the properties of sensor network topology. Considering that the discovery of real Internet topology had a tremendous impact on the research in many related areas, we believe that the systematic modeling of sensor network topology can also help us develop protocols that are particularly suited for sensor networks.

2 Outcomes

The author achieved very positive research results on the proposed project. A conference paper has been published in The 8th World Multiconference on Systemics, Cybernetics and Informatics (SCI 2004). Another paper has been completed, and will be submitted to a conference. The author believes the research results are of high quality and will attract a lot of attention in sensor networking area. The author and his collaborator are still working on the second paper, trying to further improve its quality, and hopefully we can submit it to a first-rank journal. Copies of both papers are attached to this final report, and they can also be found in the author’s personal website, http://www.uwplatt.edu/~fengg/publication.html.

The author benefited a lot from this project; after about one year’s study in sensor networking, I am confident that I have become an expert in this area. The research experience also inspired me to come up with several good ideas for how to conduct some other projects on sensor networks. The author is planning to write a proposed based on the research results to seek fund from external funding agencies.