

Master 2015

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Network Level Energy Optimization of Wireless Sensor Networks.

ABSTRACT - Masterthesis

Wireless sensor networks have become increasingly popular in many everyday applications. But, its limited source of energy has become a serious hindrance to its wide use. So, this work presents the network level energy optimization of wireless sensor networks using the process of benchmarking. Benchmarking includes defining certain parameter metrics like total energy consumption, network lifetime, etc. and monitoring their values for several network scenarios. The network scenarios are obtained by suitably changing the topology depending on the obtained values of the metric. These changes are performed until the metric values are optimized. Using the concept of topology control, the network topology is successively changed by adding and deleting the required node types and power module types according to the application requirements.

So, benchmarking is used to monitor and evaluate the optimization process, while the topology control assists in making the necessary scenario changes required for the optimization. Thus, the work performs the optimization of the performance metrics like total energy consumption, network lifetime, etc. using the benchmarking process with the help of topology control.

Along with the optimization of network level energy, the validation of the simulator using real application scenario is performed. The objective of this work also, is to validate the use of simulator to perform the network level energy optimization.