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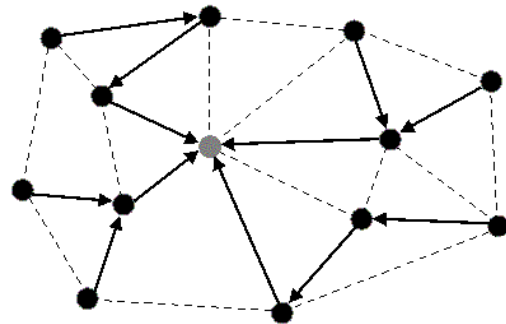
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Semester/Diploma/Master Thesis “On Correlated Data Gathering in Sensor Networks”

Recent developments in processor, memory and radio technology have made possible wireless sensor networks which are deployed to collect useful information from an area of interest. The sensed data must be gathered and transmitted to a base station where it is further processed for end-user queries. Since battery power is the scarcest resource of a sensor node, power efficient methods must be employed for data gathering and aggregation in order to achieve long network lifetimes.

The problem of gathering data in sensor networks is to find a suitable topology that minimizes the energy consumption over the whole network. There are multiple parameters that influence an optimal solution such as

- initial network topology
- correlation structure of the data
- aggregation capabilities at the nodes
- lossless vs. lossy encoding
- ...



Based on former work in this area an algorithm that results in an optimal topology for the data gathering problem is known. On the other hand, if we inverse the aggregation restriction in the former model, the problem seems to become hard. Consequently, the goal of this thesis is to derive a deeper understanding of the problem itself and of the parameters that account for the problem complexity. Therefore (distributed) algorithms should be designed that yields good data gathering topologies in various models. Besides theoretical analysis the efficiency of different algorithms can be studied by simulations.

Skills

- Basic knowledge of theoretical computer science (e.g. “Kernfach Theoretische Informatik”)

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