

Energy Consumption in Wireless Sensor Networks using GSP

Master's Thesis

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Abstract

The energy consumption rate for sensors in a wireless sensor network varies greatly based on the protocols the sensors use for communications. The Gossip-Based Sleep Protocol (GSP) implements routing and some MAC functions in an energy conserving manner. The effectiveness of GSP has already been demonstrated via simulation. However, no prototype system has been previously developed. GSP was implemented on the Mica2 platform and measurements were conducted to determine the improvement in network lifetime. Results for energy consumption, transmitted and received power, minimum voltage supply required for operation, effect of transmission power on energy consumption, and different methods for measuring lifetime of a sensor node are presented. The behaviour of sensor nodes when they are close to their end of lifetime is described and analyzed. A comparison with other models for energy consumption is made and suggestions for future work are presented.