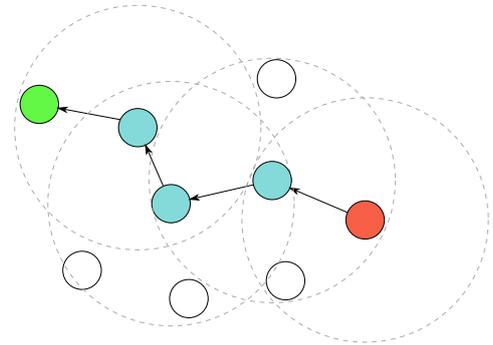


Master's Thesis

Evaluation of Selective Wake-up Receivers (SWuRx) For Routing In Wireless Sensor Networks

An important objective in the design of a communication protocol for wireless sensor networks is minimizing energy consumption. A widely used scheme to achieve this goal is duty cycling where a node is set to a deep sleep mode for most of the time and only wakes up periodically to communicate with other nodes. A new approach to save energy are wake-up receivers. These receivers only use very little power and can therefore be turned on continuously. Upon the reception of a so called wake-up signal, they wake up the node asynchronously and normal communication over the main transceiver can take place.



Recent advancements in the area of wake-up receivers add additional addressing functionality to this scheme. A *selective wake-up receiver (SWuRx)* can receive a wake-up signal that contains an address and a mask and then checks whether the received data matches the nodes address.

Goals of the thesis:

The question that should be answered within this thesis is, whether the use of an selective wake-up receiver can improve routing in a wireless sensor network. To reach this goal, it is necessary to find appropriate metrics and to think of a good way of assigning addresses to nodes. The evaluation of the developed routing algorithm should compare the solution with existing algorithms using the previously found metrics. The simulations should be conducted using the OMNeT++ framework using an existing implementation of the wake-up receiver. Knowledge in C and C++ is required and basic concepts from wireless sensor networks should be known in advance.

Literature

Johannes Blobel, Jannis Krasemann, and Falko Dressler. "An Architecture for Sender-based Addressing for Selective Sensor Network Wake-Up Receivers." In: *17th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM 2016)*. Coimbra, Portugal: IEEE, 2016. DOI: 10.1109/WoWMoM.2016.7523516

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