Simulations of Energy-Harvesting Wireless Sensor Networks with GreenCastalia

Dora Spenza

Department of Computer Science
Sapienza University of Rome

OMNeT++ Community Summit 2015
Energy Consumption Modeling and Simulation Discussion Panel
Energy Harvesting Wireless Sensor Nodes

Motes (partially) powered by environmental energy

- Virtually unlimited lifetime to WSNs
- Uncertain energy availability requires protocols re-design
- Need for simulation frameworks to support design and evaluation of harvesting-aware protocols

Image credit: pictures are copyright of the respective authors
Castalia model for OMNET++

- Simulations of distributed algorithms for WSNs
- Radio model: state-based energy consumption, accounts for delay/power of state transitions
- Simple ideal battery model, no support for energy harvesting
Castalia model for OMNET++

- Simulations of distributed algorithms for WSNs
- Radio model: state-based energy consumption, accounts for delay/power of state transitions
- Simple ideal battery model, no support for energy harvesting
GreenCastalia extension

- heterogeneous harvesting and storage
- multiple energy sources
- multi-source harvesters
- multi-storage architectures
- energy prediction models


Dora Spenza spenza@di.uniroma1.it