Wireless Energy Transfer to a Pair of Energy Receivers using Signal Strength Feedback

ABSTRACT

This paper focuses on wireless energy transfer (WET) to a pair of low complex energy receivers (ER), by only utilizing received signal strength indicator (RSSI) values that are fed back from the ERs to the energy transmitter (ET). Selecting the beamformer that maximizes the total average energy transfer between the ET and the ERs, while satisfying a minimum harvested energy criterion at each ER, is studied. This is a nonconvex constrained optimization problem which is difficult to solve analytically. Also, any analytical solution to the problem should only consists of parameters that the ET knows, or the ET can estimate, as utilizing only RSSI feedback values for channel estimation prohibits estimating some channel parameters. Thus, the paper focuses on obtaining a suboptimal solution analytically. It is proven that if the channels between the ET and the Ers satisfy a certain sufficient condition, this solution is in fact optimal. Simulations show that the optimality gap is negligibly small as well. Insights into a system with more than two ERs are also presented. To this end, it is highlighted that if the number of ERs is large enough, it is possible to always find a pair of ERs satisfying the sufficient condition, and hence, a pairwise scheduling policy that does not violate optimality can be used for the WET.

EXISTING SYSTEM

- In existing system, received signal strength indicator (RSSI) based channel learning was proposed.
- A methodology for estimating the phase values of the channels between an ER and each antenna of a multi-antenna ET, using RSSI feedback values.
- These estimates are utilized to employ equal gain transmit (EGT) beamforming for WET.

PROPOSED SYSTEM

- We focus on maximizing the average energy transfer in the WPB stage, in each transmission block.
- However, we ensure that a minimum harvested energy criterion for each ER is fulfilled, so that they can stay operational.
- In this way, we guarantee some fairness in the WET while being conscious on increasing the overall performance of the WET.

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

- Processor - Intel core i3
- RAM - 2B
- Hard Disk - 20 GB

SOFTWARE REQUIREMENTS

- Operating System : LINUX
- Tool : Network Simulator-2
- Front End : OTCL (Object Oriented Tool Command Language)

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