

Improved Long-Distance Wireless Charging Technology

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Project Overview

Wireless charging of consumer devices at a long distance with RF technology, would eliminate wires and give freedom of placement of the charging devices. Continuous non-interrupted wireless power transfer is a goal when designing the energy transmitter and harvesters. Usually there are inevitable fluctuations of the signal strength at the input of the harvester, due to multi-path propagation. This is caused by constructive and destructive addition of the electromagnetic waves. The idea of antenna diversity is that if the first antenna is experiencing a low signal strength (a deep fade), it is not very likely that the second antenna suffers from the same deep fade. To avoid a bulky dual antenna harvester design of the consumer device, the idea is to implement antenna diversity by using multiple transmit sources. By feedback of the received harvester signal level information to the transmitters, the transmitters will control their amplitude and phase in such a way that maximum power transfer occurs.

Project in cooperation with [HOLST IMEC Center, Eindhoven](#)

1 Paper as a Start of Investigation

Fadel Adib, Swarun Kumar, Omid Aryan, Shyamnath Gollakota, Dina Katabi, [Interference Alignment by Motion](#), in Proc. ACM MobiCom 2013

Tasks Associated with a Project

The MSc student project will have the following timeline:

- Literature search on transmit and receive antenna diversity
- Experiments with wireless power transfer transmit-receive boards
- Design and implementation of feedback algorithm for transmit antenna diversity
- Validation with experiments on a wireless power transfer transmit antenna diversity system

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