

**GROUP COOPERATION WITH OPTIMAL RESOURCE
ALLOCATION IN WIRELESS POWERED COMMUNICATION
NETWORKS**

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ABSTRACT

- This paper considers a wireless powered communication network (WPCN) with group cooperation, where two communication groups cooperate with each other via wireless power transfer and time sharing to fulfill their expected information delivering and achieve “win-win” collaboration.
- To explore the system performance limits, we formulate optimization problems to respectively maximize the weighted sum-rate (WSR) and minimize the total consumed power. The time assignment, beamforming vector and power allocation are jointly optimized under available power and quality of service (QoS) requirement constraints of both groups.

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CONT...

- For the WSR-maximization, both fixed and flexible power scenarios are investigated. As all problems are non-convex and have no known solution methods, we solve them by using proper variable substitutions and the semi-definite relaxation (SDR).
- We theoretically prove that our proposed solution method guarantees the global optimum for each problem. Numerical results are presented to show the system performance behaviors, which provide some useful insights for future WPCN design. It shows that in such a group cooperation aware WPCN, optimal time assignment has the most great effect on the system performance than other factors.



EXISTING SYSTEM

- However, existing works only studied the energy transfer and information delivering within the same communication group, which means that the energy was transferred from the H-AP to its users and the users used the harvested energy to transmit information to the H-AP or the energy was transferred from the source to the energy constrained relay node and then the relay help to forward the information from the source to its destinations.
- Therefore, no group cooperation was involved in existing works and the systems were designed only by considering the utility maximization of the single communication group.

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PROPOSED SYSTEM

- In this paper, we investigate the group cooperation with optimal resource allocation in WPCNs. We consider a network composed of two communication groups, where the group 1 has sufficient energy supply but no licensed bandwidth, and the group 2 has licensed bandwidth but no sufficient energy.
- Therefore, neither group can fulfill the information delivering to meet its desired information transmission rate. Considering that SWIPT provides an effective approach for information transmission and energy cooperation between nodes, we introduce the energy cooperation and time sharing between the two groups, so that group 1 may transfer some energy to group 2 and then get some transmission time from group 2 in return.



HARDWARE REQUIREMENTS

- Processor - Pentium-IV
- Speed - 1.1 Ghz
- RAM - 256MB(min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

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SOFTWARE REQUIREMENTS

- Tool - Network Simulator-2
- Operating system - LINUX
- Front end - OTCL (Object Oriented Tool Command Language)

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