Computer Science > Information Theory

Distributed SIR-Aware Scheduling in Large-Scale Wireless Networks

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(Submitted on 8 Jul 2011 (v1), last revised 20 Jul 2011 (this version, v2))

Opportunistic scheduling and routing can in principle greatly increase the throughput of decentralized wireless networks, but to be practical they must do so with small amounts of timely side information. In this paper, we propose three techniques for low-overhead distributed opportunistic scheduling (DOS) and precisely determine their affect on the overall network outage probability and transmission capacity (TC). The first is distributed channel-aware scheduling (DCAS), the second is distributed interferer-aware scheduling (DIAS), and the third generalizes and combines those two and is called distributed interferer-channel-aware scheduling (DICAS). One contribution is determining the optimum channel and interference thresholds that a given isolated transmitter should estimate and apply when scheduling their own transmissions. Using this threshold, the precise network-wide gain of each technique is quantified and compared. We conclude by considering interference cancellation at the receivers, and finding how much it improves the outage probability.

Comments:	35 pages, 5 figures, 1 table
Subjects:	**Information Theory (cs.IT)**
Cite as:	**arXiv:1107.1731 [cs.IT]**
	(or **arXiv:1107.1731v2 [cs.IT]** for this version)

Submission history

From: Chun-Hung Liu [view email]
[v1] Fri, 8 Jul 2011 20:57:36 GMT (189kb)
[v2] Wed, 20 Jul 2011 02:02:39 GMT (189kb)

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