

Stephen
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Home

Teaching

Biography

Research

Books

Papers

Software

Students

Classes

EE103

EE263

EE363

EE364a

EE364b

EE365

MOOC

CVX101

Power Control in Lognormal Fading Wireless Channels with Uptime Probability Specifications via Robust Geometric Programming

K.-L. Hsiung, S.-J. Kim and S. Boyd

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- [lognormal.pdf](#)

This paper concerns power control in lognormal fading wireless channels with correlated interference. We consider an outage-based quality of service (QoS) specification, which requires the uptime probability, *i.e.*, the probability that no transmitter/receiver pair experiences any outage due to fading, is kept above a given level. The problem of finding an optimal power allocation to achieve this QoS goal over lognormal fading wireless channels can be posed as a stochastic geometric program (GP) with joint probabilistic constraints. This stochastic geometric program is extremely hard to solve in general, compared with the stochastic GP associated with Rayleigh fading channels. In this paper, we describe a suboptimal approach based on recently proposed robust geometric programming. With a good compromise between computational efficiency and accuracy, this robust GP relaxation approach finds a power allocation which meets the QoS requirement on the uptime probability. A numerical example is given to demonstrate the method.
