Application of the conditional gradient method to resource allocation in wireless networks

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Abstract

© 2016, Pleiades Publishing, Ltd.We propose a new two-level iterative method for solution of a general problem of optimal allocation of a homogeneous resource (bandwidth) in a wireless communication network. It is divided into service zones (clusters) and the network manager can buy external volumes of this resource. This approach leads to a convex optimization problem, which is solved with a dual Lagrangian method, where calculation of the cost function value decomposes into a system of independent zonal optimization problems. Each of them is treated as a market equilibrium problem. This optimization problem is solved with conditional gradient method for different information exchange schemes for participants. Besides, we suggest several ways to adjust the basic problemto the case of moving nodes. We give some results of numerical experiments on the proposed method which confirm its preference over the previous ones.

Keywords

bandwidth, conditional gradient method, dual Lagrange method, information exchange schemes, Resource allocation, wireless networks, zonal network partition