

Generalized Stable Marriage-Assisted Power and Sub-band Allocation for Energy Efficient OFDMA-based Uplink

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Abstract—In this paper, we address a problem of joint power and sub-band allocation to maximize the energy efficiency at mobile terminals (MTs) for an OFDMA-based uplink data transmission. Due to difficulty of the combinatorial programming problem, we solve the problem by two steps. With the aid of the generalized stable marriage (GSM) method, we firstly obtain the optimal number of sub-bands as well as the corresponding sub-band assignment for each MT based on their required transmission rates and the channel state informations (CSIs). Then, a greedy algorithm is proposed to achieve an optimal power allocation for each MT based on the predecided sub-band assignments. Simulation results demonstrate that the energy efficiency of MTs for an OFDMA-based uplink data transmission can be greatly promoted by the proposed algorithm, especially for the cases with a smaller number of sub-bands.

Keyword—energy efficiency, generalized stable marriage, power allocation, sub-band allocation



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