

Opportunistic Scheduling with Quantized Feedback in Wireless Networks

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Abstract

Wireless scheduling algorithm can extract multiuser diversity (MUDiv) via prioritizing the users with best current channel condition. One drawback of MUDiv is the required feedback carrying the instantiations channel rate from all active users to the access point base station. This paper shows that this feedback load is, for the most part, unjustified. To alleviate this problem, we propose an optimal discrete rate switch-based multi-user diversity system (DSMUDiv) that allows reducing the feedback load while preserving the essential of the scheme performance. We examine DSMUDiv scheme using an absolute signal-to-noise ratio (SNR)-based scheduling mechanism, assuming all users are independent identical distributed (i.i.d.). We provide a theoretical analysis of the feedback load and the spectral efficiency for the DSMUDiv scheme and compare it with the optimal (full feedback load) selective diversity scheme. Slow Rayleigh fading is assumed. Our results show a reduction in the feedback load.