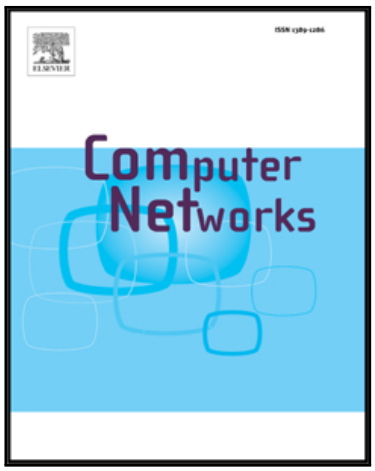

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Adaptive Resource Allocation with Traffic Peak Duration Prediction and Admission Control for Cognitive Wi-Fi Networks ☆

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Abstract

Cognitive radio network (CRN) architecture can be efficiently utilized to support different QoS requirements under variable traffic and channel conditions. Generally, deterministic radio resource allocation algorithms could significantly increase the channel utilization as well as the network QoS. In this paper, we propose an advanced cognitive network resource allocation algorithm for IEEE 802.11 cognitive Wi-Fi networks. By making use of the status of the transmission channels and the traffic conditions, the proposed algorithm effectively allocates secondary radio resources to improve the overall radio resource utilization and the QoS of the CSMA/CA-based networks. To improve the accuracy and efficiency of the proposed algorithm, a Markov chain model based technique that estimates the achievable network throughput is employed. Furthermore, an autoregressive moving average (ARMA) based model is used to predict the traffic peaks when allocating the channels. OMNeT++ based simulation models are then developed to analyze the performance of the proposed algorithm. It is

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