

## ABSTRACT

MACHADO, R. C. R. *Adaptative Backoff Algorithm based on active neighbors control for IEEE 802.11 networks*. 2016. 73 f. Dissertação (Mestrado em Engenharia Eletrônica) – Faculdade de Engenharia, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, 2016.

On IEEE 802.11 wireless networks, the backoff algorithm of the MAC sublayer plays a significant role on the distributed coordination of the stations competing for the media access. Even after studies and several enhancements, problems of excessive collisions and injustice that cause permanent or prolonged starvation of one or more stations still occur, especially in saturation scenarios. The purpose of this work is to evaluate the performance of a new backoff algorithm proposal named nMBEB (Modified Binary Exponential Backoff Algorithm - with node control). The nMBEB algorithm provides a better adaptation to network load variation through the monitoring of the number of active stations in range of the sender station. The nMBEB algorithm uses different multiplicative factors into contention window increment and decrement functions of the backoff algorithm. Simulation results obtained using the NS-2 simulator show that the nMBEB algorithm achieves an enhancement on throughput and fairness performance when compared with traditional Binary Exponential Backoff (BEB) algorithm of IEEE 802.11 and with other algorithms from the literature in network saturation scenarios. The performance improvement also happens in scenarios where a large number of stations asynchronously initiate their respective data flows.

Keywords: Wireless, 802.11, MAC, *Backoff*, Performance, Fairness