A discrete event framework for OFDMA relay-based cellular networks

ABSTRACT

The cooperation of Relay-Based Cellular Network (RBCN) and Orthogonal Frequency-Division Multiple Access (OFDMA) techniques provide rich of promising solutions especially in terms of Radio Resource Management (RRM). However, the main challenge of this cooperation is managing the resources in a dynamic system in the midst of co-channel interference. Allocating of the RRM associated schemes have been developed to overcome these interferences and to operate the relays in a dynamic and opportunistic manner. The deployments of these RRM schemes have enormous matrices of combination analyzing these performances are of vital essence. There are different simulator tools to address these needs such as NS2, OPNet, OMNet++, etc. An effort to enrich these repositories of simulators is to provide a discrete customization of analyzing the main aim of the study. A discrete event simulation for RBCN evaluation using a general-purpose programming language has been solved. The performance analysis orientation is on Signal-to Interference-plus-Noise Ratio (SINR) algorithm with specific focus on the transmission reliability of relays for channel fading in terms of spectral efficiency for downlink of OFDMA relay-based cellular networks. The developed simulator has been extensively tested and has proven to be a valid and substantial simulator.

Keyword: Discrete event simulation; Scheduling; Queuing; Performance modeling