Abstract

Cognitive radio network (CRN) is the latest paradigm of techniques for enhancing the utility and quality of radio communication systems by the efficient utilization of frequency spectrum. It is classified by overlay and underlay cognitive radio. Antennas designed for the overlay scheme must have the capability to sense the channel and provide communication over a portion of it. Overlay antennas can be designed as two-port, where one port supports ultra wideband, and the other supports narrowband and are frequency reconfigurable. Moreover, they can be implemented as a one-port antenna, in which the same port is used for both sensing as well as communicating, and thus it must switch between wideband and narrowband modes. Evolutionary computation techniques like the genetic algorithm (GA) are efficient in designing new kinds of antennas with challenging designs. A binary genetic algorithm can be utilized to optimize the shape of an antenna to achieve maximum possible frequency reconfigurability with minimum number of switches for obtaining a wideband performance from a single cognitive radio antenna.

References


Index Terms

Computer Science Wireless

Keywords

Cognitive radio networks, reconfigurable antenna, genetic algorithm.