Abstract

Cognition is a high level mental faculty of the brain that includes functions like adaptation, learning, deciding, and others. Accordingly, a Cognitive Radio must have capabilities that mimic such Cognitive functions. As one of the fundamental cognitive abilities of the radio, this paper proposes a novel adaptation method; which uses Real-coded Genetic Algorithms (RGA) to adapt physical layer radio parameters in response to varying environmental conditions and different user services. The adaptation method is applied in a single objective optimization setting – that's the minimization of BER. Minimum transmitted EIRP levels of the resulting solutions are achieved by using a special Power Limiting Algorithm (PLA) which increments the maximum transmitted allowable EIRP levels during the engine run, if it experienced a slow convergence towards the optimal required solution. Results have indicated the success of the engine in adapting the physical layer radio parameters in response to varying environmental conditions and different user services to minimize resulting link BER, with the minimum possible transmitted EIRP levels.
References


Index Terms

Computer Science       Wireless Communications

Keywords

Adaptation Cycle      Adaptation Engine      Real-coded Genetic Algorithms