Abstract

TV white spaces (TVWS) can be used by Secondary Users (SUs) through Dynamic Spectrum Access (DSA) as long as they do not cause harmful interference to Primary Users (PUs). Due to spectrum scarcity, there is increasing demand for DSA. When there is a high density of SUs in a TVWS network such as cellular access to TVWS, a problem of interference among SUs will arise. The possibility of harmful interference to PUs may also arise. Optimization of power allocation is therefore necessary to reduce the level of interference among SUs and to protect PUs against harmful interference. Performance of different hybrid firefly algorithm with particle swarm optimization and genetic algorithm for optimization of power allocation in a TVWS network are compared. Simulation was done using Matlab. Simulation results show that hybrid of firefly algorithm, particle swarm optimization and genetic algorithm outperform other hybrid firefly algorithms. Hybrid of firefly algorithm, particle swarm optimization and genetic algorithm achieves best throughput, sum power as well as objective function value.
References


Comparison of Hybrid Firefly Algorithms for Power Allocation in a TV White Space Network


Index Terms

Computer Science

Algorithms

Keywords

TV White Spaces, power allocation, cognitive radio, hybrid firefly algorithm, continuous
optimization, firefly algorithm, genetic algorithm, particle swarm optimization.