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Dynamic spectrum allocation for TVWS wireless access from high altitude platform

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Abstract

The issue of spectrum allocation in cognitive high altitude platform wireless networks using TV White Space (TVWS) spectrum is presented in this paper. The mathematical model of spectrum allocation is given, and this model is converted into a constrained optimization problem with the goal of maximizing network benefits. Then, a spectrum allocation optimization approach is proposed that is based on improved immune clonal selection algorithm. According to the characteristics of the problem, the design, coding, cloning, mutation, hypermutation and selection operators suitable for the algorithm's solution are presented. Finally, a simulation experiment was carried out on this algorithm. The proposed algorithm was validated and proved that it converges better than Genetic Algorithm (GA) and Particle Swarm Optimization (PSO). Moreover, experiments demonstrate that the suggested approach maximizes network benefits or rewards more effectively when compared with GA and PSO algorithms and results proved the effectiveness of the algorithm.