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Intelligent power allocation for cognitive HAP wireless networks using TVWS spectrum

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Abstract

Aiming at the problem of downlink power allocation in cognitive high-altitude platform wireless networks exploiting TV white space spectrum, it is mathematically formulated as a constrained optimization problem, and then an improved immune clonal optimization algorithm is proposed. The mathematical optimization model, algorithm realization process, and key technologies for power allocation are given, and coding, cloning, and mutation suitable operator for algorithm solving are designed. The findings of the simulation experiment indicate that, under the constraints of total transmit power, bit error rate, and interference tolerable to the main user, the algorithm can obtain a greater total data throughput, faster convergence speed, and better power allocation can be obtained. Finally, the proposed algorithm outperforms the Particle Swarm Optimization algorithm.