

Resource competition is inevitable in shared resource systems, as the number of users increases or their resource demands change. In wireless networks, this problem is aggravated due to the existence of co-channel interference. Without appropriate control, harmful competition causes unbalanced user consumption of resources (e.g. starvation), and resource waste due to conflicts and idleness. In this paper we propose a novel framework to effectively manage resources (e.g. shared wireless channels). Compared with the state-of-art global optimization algorithm, our method is superior in terms of eliminating control overhead caused by message passing, achieving competitive performance, and reducing computation complexity. This framework combines the advantages of both global and local optimization methods and drives the system toward a global optimum by intelligently exploiting local information.