

Parameter Tuning of Complex Systems Modeled in Agent Based Modeling and Simulation

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Abstract : The major problem encountered when modeling complex systems with agent-based modeling and simulation techniques is the existence of large parameter spaces. A complex system model cannot be expected to reflect the whole of the real system, but by specifying the most appropriate parameters, the actual system can be represented by the model under certain conditions. When the studies conducted in recent years were reviewed, it has been observed that there are few studies for parameter tuning problem in agent based simulations, and these studies have focused on tuning parameters of a single model. In this study, an approach of parameter tuning is proposed by using metaheuristic algorithms such as Genetic Algorithm (GA), Particle Swarm Optimization (PSO), Artificial Bee Colonies (ABC), Firefly (FA) algorithms. With this hybrid structured study, the parameter tuning problems of the models in the different fields were solved. The new approach offered was tested in two different models, and its achievements in different problems were compared. The simulations and the results reveal that this proposed study is better than the existing parameter tuning studies.

Keywords : parameter tuning, agent based modeling and simulation, metaheuristic algorithms, complex systems

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