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THE METHOD OF SELF-ORGANIZATION OF INFORMATION NETWORKS IN THE CONDITIONS OF THE COMPLEX INFLUENCE OF DESTABILIZING FACTORS

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Optimization is a complex process of identifying multiple solutions for a variety of functions. Many calculation tasks today belong precisely to optimization tasks. While solving optimization tasks, decision variables are defined in such a way that information networks work at their best point (mode) according to the optimization criterion. The problems of optimization of information networks are discontinuous, undifferentiated and also multimodal. Thus, it is impractical to use classical gradient deterministic algorithms to solve the tasks of self-organization of information networks. Considering the above, the actual scientific task is the development of the self-organization method of information networks under the complex influence of destabilizing factors with the use of artificial intelligence, which would allow you to increase the efficiency of the decisions made regarding the management of self-organization parameters of information networks with a given reliability.

The method of self-organization of information networks in conditions of destabilizing factors consists of the following sequence of actions:

Step 1. Input of initial data.

Step 2. Exposure of individuals of the combined flock on the search plane.

Step 3. Numbering of individuals in the flock of the combined algorithm.

Step 4. Determining the initial speed of individuals of a flock of the combined algorithm.

Step 5. Preliminary evaluation of the search (feeding) area by individuals of the combined flock.

Step 6. Classification of food sources for combined swarm agents.

Step 7. Sorting of the best individuals of the flock of the combined algorithm. Steps 1−7, 10−15 are common to all individuals of the combined algorithm. The remaining procedures are unique for each of the swarm optimization algorithms.

Step 8. Procedure for optimizing a flock of hawk agents.

Step 8.1 Execution of the intelligence procedure of the algorithm of a flock of hawk agents.

8.2 Research phase for the hawk-agent swarm algorithm.

8.3 Implementation of the soft siege strategy by individuals from the flock of hawk agents.

8.4 Execution of a hard siege strategy by hawk agents.

8.5 Executing a soft siege strategy with gradual rapid dives for a flock of hawk agents.

8.5 Execution of a hard siege strategy of hawk agents with gradual rapid dives.

Step 9. Execution of the coot herd optimization algorithm.

9.1 Random movement of coot agents.

9.2 Chain movement of coot agents.

9.3 Setting positions based on group leaders.

9.4 Leadership movement of coot agents

Step 10. Combining individual optimization algorithms into a mixed one.

Step 11. Checking the presence of predator agents of the combined flock. At this stage, agents check for prey. If there are predators, go to step 12. If there are no predators, go to step 11.

Step 12. Escape and struggle with predators of combined flock agents.

Step 13. Checking the stop criterion.

Step 14. Training of the knowledge bases of agents of the combined flock.

Step 15. Determining the amount of necessary computing resources, intelligent decision making support system.