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Editorial

Ant Colony Optimization with New Approaches

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DESCRIPTION

Ant Colony Optimization (ACO) is one of the most successful techniques in the wider field of swarm intelligence. Ant Colony Optimization (ACO) is a metaheuristic used to solve combinatorial optimization problems, as with other metaheuristics, like evolutionary methods, ACO algorithms often show good optimization behavior but are slow when compared to classical heuristics. Hence, there is a need to find fast implementations for ACO algorithms. In order to allow a fast parallel implementation, This proposes several changes to a standard form of ACO algorithms. The main new features are the non-generational approach and the use of a threshold based decision function for the ants. It shows that the new algorithm has a good optimization behavior and also allows a fast implementation on reconfigurable processor arrays. This is the first implementation of the ACO approach on a reconfigurable architecture. The work is devoted to solving transportation problems with ant colony algorithms. These algorithms are based on the simulation of the behavior of an ant colony. Several modifications of the ant colony algorithm are developed.

Ant colony optimization based polymorphism

To solve the problem, a routing algorithm (APAR algorithm based on ant colony optimization) that is conscious of polymorphism has been proposed. This algorithm integrates the ACO algorithm and the dynamic source routing algorithm, and the pheromone level of the route acquired during the routing recognition process is selected as the standard for route selection, and it is calculated by detecting the distance and congestion level of the route increase and route stability. A new pheromone volatilization mechanism has also been introduced into the algorithm. In the meantime, the algorithm can adjust the distribution formation to avoid poor network performance. Stimulation results show that the APAR algorithm is superior to traditional algorithms in terms of packet delivery rate, end-to-end latency, and routing overhead, and is reliable in a battlefield environment.

Ant's social and behavioral polymorphism

The observed social and behavioral polymorphisms identify the factors that cause these changes and thus provide an opportunity to further study the behavioral and social polymorphisms of this species of ants. In ants, both the number of matings per queen and the number of queens per colony can vary significantly. Polygamy and polygamy colony workers often fight fiercely, but extreme polygamy involving thousands of queens in spatially separated but interconnected nests and interact peacefully. Studies of social and behavioral polymorphisms within ant species help to elucidate their effects on genetic diversity and behavior, as well as the factors that cause changes in social structure and behavior. Social and behavioral polymorphisms can also be observed within ant species that explain behavioral changes. Workers belonging to the same super colony behave peacefully with each other, although they may often come from different nests hundreds to thousands of kilometers apart, but single-wife and single-wife colony workers usually, when you encounter a non-nest companion, you fight fiercely.

CONCLUSION

ACO (Ant Colony Optimization) asynchronous agents or ants are constantly released from different nodes to produce partial solution to the problem while traversing through different phases of the problem. While traversing, these agents follow a greedy local decision policy which reply over two parameters, namely, attractiveness and trail information. Each ant while traversing through different phases of the problem incrementally produces a partial solution to the problem. Search of the future ants are directed by the trail value which is updated by the ants which earlier traversed through the same path. Furthermore, an ACO algorithm involves two mechanisms which enhance the capabilities of the algorithm which are trail evaporation and daemon actions.

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