

Ant Colony Optimization Approach to Tokens' Movement within Generalized Nets

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Generalized Nets (GNs) is a concept extending the concept of Petri nets and the rest of its modifications. One of the aspects of generalization is the fact that the GN transitions possess an index matrix of predicates, determining the conditions for tokens' transfer from any input place of the transition to any output place. On the other hand, the tokens enter the GN with their initial characteristics and during their transfer from the input to the output places of the transition, they are assigned new characteristics by means of special characteristic functions. GNs have been applied to modelling of processes in the field of artificial intelligence (expert systems, neural networks, pattern recognition, machine learning, etc.), and in particular to metaheuristic methods for solving of optimizational problems like the transportational problem, the travelling salesman problem, the knapsack problem. An important venue of application of GN is the area of Ant Colony Optimization (ACO). So far, GN have been used as a method for description of the ACO procedures. The present article for the first time adopts the opposite approach: it discusses the possibility for optimization of the GN tokens' movement, using ACO algorithms.