Using a Modified Ant Colony Algorithm Approach to Solve Assignment Problems

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Abstract

An assignment problem (AP) is concerned with what happens to the effectiveness function when some origins are associated with the same number of destinations. Each resource should be associated with one and only one job, and the associations should be created in such a way that the total effect is minimized. The AP is a subset of transportation problems, and it is a subject that is frequently discussed in the real world. The literature demonstrates that different techniques have been developed in the past to solve the AP. In some techniques, concentrate on finding an initial basic, feasible solution, while the rest of the techniques focus on finding the optimal solution to the AP. The Hungarian method produces an effective response to the task. In this study, we apply the Modified Ant Colony Optimization (ACO) Algorithm to solve AP. This is based on the Ant Colony Algorithm (ACA) approach, which has been shown to provide near-optimal solutions to large-scale APs with a reasonable degree of satisfaction. The degree of satisfaction of the optimal solution has been improved in this unique technique by altering ACA with the incorporation of the Transition Rule and Pheromone Update Rule. This study's algorithmic method is less complicated than well-known meta-heuristic algorithms in the literature. Finally, we use the proposed method to demonstrate it**.**

Keywords: *Assignment problem, Hungarian method, optimization, ant colony algorithm, alternate method*

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