

An ant colony system approach for variants of the traveling salesman problem with time windows

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Abstract

The Traveling Salesman Problem with Time Windows has important applications in routing and scheduling and has been extensively studied in literature. In the paper, a mathematical formulation of the *temporal*-Traveling Salesman Problem with Time Windows is presented and a meta-heuristic based on Ant Colony System is proposed and implemented. Computational experience on a benchmark problem is reported and a case study is analyzed, where interesting results are obtained.

Keywords : Ant Colony System, temporal-TSPTW.

1. Introduction

The Traveling Salesman Problem with Time Windows (*TSPTW*) consists in finding the minimum length circuit to be travelled by a vehicle, which must visit a set of nodes exactly once. The service at each node must begin within a specific time window. If the vehicle arrives too early, it has to wait until the window opens, while if it arrives too late the service is not possible [4].

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