

A Distributed Dispatching Method for Pickup and Delivery Vehicles

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Abstract

Dispatching is to assign delivery tasks to vehicles. When the numbers of vehicles and delivery tasks are large and owners of vehicles and shippers are independent decision makers, the dispatching-decision process becomes very complicated because of the excessive computational time and a variety of unique constraints and conditions that each vehicle or each task has. In the case, the distributed dispatching method is a practical alternative, in which each vehicle or each task is considered to be an independent decision maker who selects the most favorable delivery task or vehicle based on its own objective function. The coordination among these independent decision makers is accomplished based on the pricing mechanism of a market. The basic rationale of the distributed dispatching algorithm is discussed and a task-initiated and a vehicle-initiated dispatching algorithm are suggested. The suggested algorithms are tested by a simulation study.