

DEA 기법을 이용한 무인운반차량 시스템의  
급송규칙에 관한 연구

**Data Envelopment Analysis for a Dispatching Algorithm  
in Automated Guided Vehicle Systems**

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**Extended Abstract**

At the present time, automated guided vehicles (AGVs) become the most widely used method for transporting pallets and parts between workstations in flexible manufacturing systems (FMSs). These vehicles automatically navigate along a fixed guided path that is usually defined by wire embedded in the floor, or by strip of reflective tape, or by other guidance methods. For the efficient operation of AGV systems, a number of vehicle dispatching policies appeared in the literature. These policies can be classified into two categories. One is work center initiated dispatching rule and the other is vehicle initiated dispatching rule.

In this paper we develop a vehicle initiated dispatching rule. The AGV system considered in this paper is a component of a job-shop-type automated manufacturing system. It consists of several single-load vehicles traveling along guided paths between pickup/delivery points of workstations in the manufacturing system. Each workstation has incoming buffer and outgoing buffer of which capacities are assumed to be fixed.

We use three kinds of urgency functions utilizing the information of work-in-process in incoming and outgoing buffers of each workstation, and the AGV travel time to the destination workstation. If an AGV becomes idle, a value obtained from the dispatching function which is defined as a weighted sum of the urgency functions is used to select the most urgent move request among competitive ones. In this study, an appropriate weight of each urgency function is determined utilizing the concept of voting model from data envelopment analysis (DEA).

The performance of the proposed dispatching policy is compared with some well-known existing rules in terms of the system throughput through simulation on a hypothetical job shop type manufacturing system.