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Using Clustering to Improve Material Handling in Warehouses + Software

Software utilizing advanced algorithms minimizes material handling and aisle congestion in warehouses by optimizing part locations and movements, resulting in over 40 percent efficiency reduction.

In warehouses, the primary resources are material handling tools and workers. The material handling systems, which include tools and human resources, are responsible for picking, moving, and storing the parts, packages, and pallets within warehouses. Workers spend considerable time in the picking area collecting the parts ordered by the customers and taking them to the packing area for packing and shipment. The length of time spent by such workers is the primary cause of late shipments.

Researchers at Purdue University have developed software that helps minimize material handling in warehouses. This software uses several methods and algorithms to form part families and determine optimal locations of parts in the layout. The proposed algorithms also consider the intergroup movements to minimize the travel distance of such movements. Furthermore, this technology helps users minimize the amount of congestion in aisles caused by multiple workers. This software has been shown to reduce material handling by more than 40 percent.

Advantages:

-Compares several algorithms for clustering and locating parts in the layout

-Algorithms consider the inter-group movements to minimize the travel distance

-Ability to create quick, customized scene sketches and documentation

Potential Applications:

-Logistics

-Warehouse Management

Technology ID

2015-LEHT-67001

Category

Artificial Intelligence & Machine Learning/Reinforcement & Federated Learning
Robotics & Automation/Simulation, Digital Twins, & Industrial Automation

Authors

Mark R Lehto
Mohammad Moshref Javadi

Further information

Aaron Taggart
adtaggart@prf.org

View online

TRL: 4

Intellectual Property:

Provisional-Patent, 2014-11-07, United States | Copyright, 2016-02-01, United States

Keywords: warehouse material handling minimization, part family formation, optimal part location, warehouse layout optimization, minimized travel distance, aisle congestion reduction, material handling software, logistics optimization algorithms, warehouse management technology, clustering algorithms, Big Data, Computer Technology, Software