

Research

EXECUTIVE SUMMARIES : EDITED BY CANDACE YANO



Packing it up: Kevin Gue knows how to load a car trunk ... or a ship.

Here, we highlight two articles from the January 2006 issue of IIE Transactions, which covers design and manufacturing. The first summary gives an overview of research motivated by ship design problems facing the U.S. military. The second focuses on speeding the diagnosis of quality problems in integrated circuit manufacturing. Both articles appear in the January 2006 issue of IIE Transactions (Vol. 38, No. 1).

Ship loading

Do you recall the last time you loaded your car trunk at the beginning of a driving vacation, and then only hours into the trip, one of your family members wanted something that happened to be at the bottom of your tightly packed trunk? If the trunk had not been packed so tightly, it would have been easier to

access this needed item. On the other hand, less tight packing would have meant that you wouldn't have been able to carry as much.

The U.S. Navy and Marine Corps face the same problem when designing a floating distribution center. On one hand, they want the densest possible storage to conserve space on the ship; on the other, they need a high rate of throughput to retrieve items to support Marines on the beach.

In "Very High Density Storage Systems," professor Kevin Gue in the department of industrial and systems engineering at Auburn University tackles the problem of determining how many items can be fit into a space such that getting any single item out is not too difficult. Of course, it becomes harder to get

something out as the number of layers of storage increases.

Gue's method determines the best way to load a rectangular storage space to minimize retrieval times. It allows the designer to specify the maximum stacking depth and to see the effects on retrieval times. The method can be applied to the design of other storage systems such as parking lots and storage yards for shipping containers.

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Speedy quality diagnosis

The integrated circuit industry has