



*Institute for Operations Research
and the Management Sciences*



The INFORMS Computing Society

2007 ICS Prize

for

Research Excellence in the Interface

Between Operations Research and Computer Science

**J. Csirik, D. S. Johnson, C. Kenyon,
J.B. Orlin, P.W. Shor, and R.R. Weber**

for their paper

On the Sum-of-Squares Algorithm for Bin Packing,

Journal of the Association of Computing Machinery 53, (2006), 1-65.

The paper presents a very comprehensive analysis of an algorithm for the online bin packing problem. The algorithm, which is deceptively simple, is known as the sum-of-squares algorithm. The authors show that under a very wide class of input distributions the algorithm is asymptotically optimal. Further the analysis leads to simple algorithmic modifications that lead to asymptotic optimality for input distribution classes where the basic algorithm is not asymptotically optimal. The paper fits very strongly at the interface between operations research and computer science as both the bin packing problem and online algorithms have received significant research attention from both communities. In addition, while this work develops strong theory, the theory is used to derive a practical solution approach for all classes of input streams. The proofs of the several results are both deep and, at times, elegant and include the analysis of a linear program of interest in its own right. The algorithm's simplicity and the fact that it is specifically oriented for the online setting suggest that these results should have applicability beyond the bin packing setting.

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