

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE  
UNIVERSITY OF SOUTHERN DENMARK, ODENSE

# COMPUTER SCIENCE COLLOQUIUM

## **Bin packing with general cost structures**

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### **Abstract:**

Following the work of Anily et al., we consider a variant of bin packing, called "bin packing with general cost structures" (GCBP) and design an asymptotic fully polynomial time approximation scheme (AFPTAS) for this problem. In the classic bin packing problem, a set of one-dimensional items is to be assigned to subsets of total size at most 1, that is, to be packed into unit sized bins. However, in GCBP, the cost of a bin is not 1 as in classic bin packing, but it is a non-decreasing and concave function of the number of items packed in it, where the cost of an empty bin is zero. The construction of the AFPTAS requires novel techniques for dealing with small items, which are developed in this work. In addition, we develop a fast approximation algorithm which acts identically for all non-decreasing and concave functions, and has an asymptotic approximation ratio of 1.5 for all functions simultaneously. (Joint work with Leah Epstein.)

Host: Lene Favrholdt