Industrial & Systems Engineering
Seminar Announcement

Polynomiality for Bin Packing with a Constant Number of Item Types

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Abstract: We consider the bin packing problem with d different item sizes s_i and item multiplicities a_i, where all numbers are given in binary encoding. This problem formulation is also known as the 1-dimensional cutting stock problem. In this work, we provide an algorithm which, for constant d, solves bin packing in polynomial time. This was an open problem for all d >= 3. In fact, for constant d our algorithm solves the following problem in polynomial time: given two d-dimensional polytopes P and Q, find the smallest number of integer points in P whose sum lies in Q.

This is joint work with Michel X. Goemans.

Bio: Thomas Rothvoss is Assistant Professor in the Department of Mathematics as well as in the Department of Computer Science and Engineering at the University of Washington. He completed his PhD in Mathematics in 2009 at EPFL under Friedrich Eisenbrand, followed by a PostDoc at MIT with Michel Goemans. His work received best paper awards at STOC 2010, SODA 2014 and STOC 2014. He was a recipient of a 2015 Alfred P. Sloan Research Fellowship and a David and Lucile Packard Foundation Fellowship in 2016 as well as an 2017 NSF CAREER grant.

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