A Reduction from Chores Allocation to Job Scheduling

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Abstract

We consider allocating indivisible chores among agents with different cost functions, such that all agents receive a cost of at most a constant factor times their maximin share. The state-of-the-art was presented in In EC 2021 by Huang and Lu. They presented a non-polynomial-time algorithm, called HFFD, that attains an 11/9 approximation, and a polynomial-time algorithm that attains a 5/4 approximation.

In this paper, we show that HFFD can be reduced to an algorithm called MultiFit, developed by Coffman, Garey and Johnson in 1978 for makespan minimization in job scheduling. Using this reduction, we prove that the approximation ratio of HFFD is in fact equal to that of MultiFit, which is known to be 13/11 in general, 20/17 for n at most 7, and 15/13 for n=3.

Biography

Xin Huang is a postdoc in the Department of Computer Science at Technion. He received his Ph.D. from the Department of Computer Science and Engineering at The Chinese University of Hong Kong. Before that, he got his bachelor degree from Nanjing University. He works on algorithmic game theory and mainly focus on the fair division problems.