SAMI DAVIES, University of Washington

Scheduling with Communication Delays via LP Hierarchies and Clustering

We study scheduling with precedence constraints and communication delays. Here, if two dependent jobs are scheduled on different machines, then c time units must pass between their executions. Previously, the best known approximation ratio was $O(c)$, though an open problem in the top-10 list by Schuurman and Woeginger asks whether there exists a constant-factor approximation algorithm. We give a polynomial-time $O(\log c \cdot \log m)$-approximation algorithm when given m identical machines and delay c for minimizing makespan. Our approach uses a Sherali-Adams lift of an LP relaxation and a clustering of the semimetric space induced by the lift.