Impatient Online Matching

Date: 12 December 2018 (Wednesday)
Time: 4:00pm to 5:00pm
Venue: P7303, 7/F, Yeung Kin Man Academic Building (YEUNG)
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Abstract

We investigate the problem of Min-cost Perfect Matching with Delays (MPMD) in which requests are pairwise matched in an online fashion with the objective to minimize the sum of space cost and time cost. Though linear-MPMD (i.e., time cost is linear in delay) has been thoroughly studied in the literature, it does not well model impatient requests that are common in practice. Thus, we propose convex-MPMD where time cost functions are convex, capturing the situation where time cost increases faster and faster. Since the existing algorithms for linear-MPMD are not competitive any more, we devise a new deterministic algorithm for convex-MPMD problems. For a large class of convex time cost functions, our algorithm achieves a competitive ratio of $O(k)$ on any $k$-point uniform metric space. Moreover, our deterministic algorithm is asymptotically optimal, which uncover a substantial difference between convex-MPMD and linear-MPMD which allows a deterministic algorithm with constant competitive ratio on any uniform metric space.