

## **A Dynamic Near-Optimal Algorithm for Online Linear Programming**

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A natural optimization model that formulates many online resource allocation problems is the online linear program (LP) where the constraint matrix, along with the objective coefficient, is revealed column by column. We provide a near-optimal algorithm for this surprisingly general class of online problems under the assumption of random order of arrival and some conditions on the data and size of the LP problem. Our algorithm has a feature of "learning while doing" by dynamically updating a threshold price vector at geometric time intervals, where the (dual) prices learned from revealed column information in earlier periods are used to determine the sequential decisions in the current period. In particular, our algorithm doesn't assume any prior distribution information on the input itself, thus it is robust to data uncertainty and variations due to its dynamic learning capability.

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