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Longest Common Extensions in Sublinear Space

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Abstract:

The longest common extension problem (LCE problem) is to construct a data structure for an input string T of length n that supports LCE(i,j) queries. Such a query returns the length of the longest common prefix of the suffixes starting at positions i and j in T. This classic problem has a well-known solution that uses O(n) space and O(1) query time. In this paper we show that for any trade-off parameter $1 \leq t \leq n$, the problem can be solved in O(n/t) space and O(t) query time. This significantly improves the previously best known time-space trade-offs, and almost matches the best known time-space product lower bound.

Host: Kim S. Larsen