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A linear-space data structure for range-LCP queries in poly-logarithmic time. (English)

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In this paper, the authors study the range-LCP problem (or `rlcp`), which asks, given a text T of length n , for the Longest Common Prefix (LCP) of suffixes of T (namely $T[i, n]$ and $T[j, n]$) among all $\alpha \leq i \neq j \leq \beta$, where α and β are integers (satisfying $1 \leq \alpha < \beta \leq n$) given as input.

The main question raised and positively answered by the authors is whether it is possible to answer `rlcp` in polylogarithmic time, using a linear-space data structure. More precisely, the data structure used takes $O(n)$ space and is constructed in $O(n \log n)$ time. Using the above-mentioned data structure, `rlcp` can then be answered in $O(\log^{1+\varepsilon} n)$ time, for any $\varepsilon > 0$.

Papers dealing with string algorithms are not always easy to follow for the non-specialist, as this topic has a long and rich history, uses many notations, and (as is the case here) aims at improving time/space complexities and thus provides detailed and thorough analyses. This paper is no exception. One has to be familiar with string algorithms (and in particular with suffix arrays, suffix trees and of course LCP issues) to understand the paper's contents.

Reviewer: [Guillaume Fertin \(Nantes\)](#)

MSC:

- 68P05 Data structures
- 68Q25 Analysis of algorithms and problem complexity
- 68W32 Algorithms on strings

Keywords:

[string algorithms](#); [longest common prefix](#); [indexing version](#)

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