

Abstract

We show that the compressed suffix array and the compressed suffix tree of a string T can be built in $O(n)$ deterministic time using $O(n \log \sigma)$ bits of space, where n is the string length and σ is the alphabet size. Previously described deterministic algorithms either run in time that depends on the alphabet size or need $\omega(n \log \sigma)$ bits of working space. Our result has immediate applications to other problems, such as yielding the first deterministic linear-time LZ77 and LZ78 parsing algorithms that use $O(n \log \sigma)$ bits.