Streaming k-edit approximate pattern matching via string decomposition

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Abstract: In this paper we give an algorithm for streaming k-edit approximate pattern matching which uses space $\tilde{O}(k^2)$ and time $\tilde{O}(k^3)$ per arriving symbol. This improves substantially on the recent algorithm of Kociumaka, Porat and Starikovskaya (2021) which uses space $\tilde{O}(k^5)$ and time $\tilde{O}(k^8)$ per arriving symbol. In the k-edit approximate pattern matching problem we get a pattern P and text T and we want to identify all substrings of the text T that are at edit distance at most k from P. In the streaming version of this problem both the pattern and the text arrive in a streaming fashion symbol by symbol and after each symbol of the text we need to report whether there is a current suffix of the text with edit distance at most k from P. We measure the total space needed by the algorithm and time needed per arriving symbol.

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