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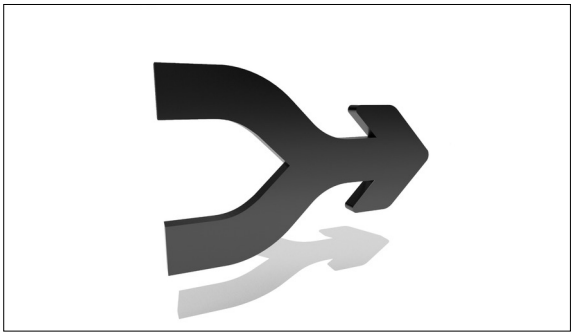
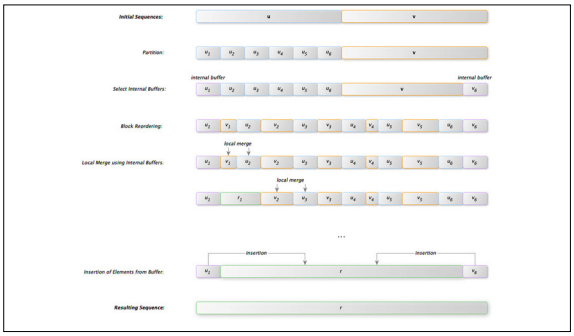
Subject Area	Software and Systems

On Minimum Storage Merge Algorithms



Project Logo
Own presentment



Blockmerge Process
Own presentment

Introduction: In computer science, merging refers to the process of combining the elements of two pre-ordered sequences into a single ordered sequence. While an implementation of a merge algorithm with asymptotically linear additional memory can be found in every text book on algorithms, the problem of merging to pre-ordered sequences with a limited amount of additional memory is hard to solve. The extensive research in this field over the past fifty years has lead to numerous publications on and propositions for minimum storage merge algorithms.

Approach: As part of the Master of Science in Computer Science MSE at the University of Applied Sciences in Rapperswil (OST), this study investigates the current state of research for this kind of algorithms. Based on a systematic structure and the introduction of a classification into three distinct conceptual categories, the first part of this research project is dedicated to an overview of the various existing minimum storage merge algorithms by explaining the basic idea behind the conceptual categories and by analysing the asymptotic runtime behaviour of their latest published developments. In the second part, a novel approach for the development of a minimum storage merge algorithm is algorithmically and mathematically analysed.

Result: Finally, a practical evaluation of the latest merge algorithm of each category using a framework specifically designed for the analysis of algorithms brings this study to a close.