

December 2010

MADALGO seminar by Jakob Truelsen, Aarhus University

A Cache-Oblivious Implicit Dictionary with the Working Set Property

Abstract:

We present an implicit dictionary with the working set property i.e. a dictionary supporting $\text{insert}(e)$, $\text{delete}(x)$ and $\text{predecessor}(x)$ in $O(\log n)$ time and $\text{search}(x)$ in $O(\log l)$ time, where n is the number of elements stored in the dictionary and l is the number of distinct elements searched for since the element with key x was last searched for. The dictionary stores the elements in an array of size n using no additional space. In the cache-oblivious model the operations $\text{insert}(e)$, $\text{delete}(x)$ and $\text{predecessor}(x)$ cause $O(\log_B n)$ cache-misses and $\text{search}(x)$ causes $O(\log_B l)$ cache-misses.

Joint work with Gerth Stølting Brodal and Casper Kejlberg-Rasmussen