

Improving the Space-Time Efficiency of Matrix Multiplication Algorithms

Classic PA algorithms may not utilize all processors effectively unless processor number p matches well an algorithm's structure; Classic PO algorithms achieves optimality either in space or time, but not both.

We propose the STAR technique, which generalizes the "busy-leaves" property, a memory allocator that guarantees the reuse of space on each processor, and lazy allocation, to improve the space-time efficiency of MM and Strassen's algorithms, i.e. both sub-linear time complexities (critical-path length) and optimal cache complexities.. Both theoretical justification and experimental results are provided.

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