ABSTRACT

Fast Matrix Multiplications

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The purpose of this BSc thesis is to map what kind of methods are there to multiply two matrices with less operations or with less running time than the naive algorithm. We also examine special matrices. We exploit their structures to store them in much less space.

We take a closer look at Strassen's algorithm that was the first to multiply two matrices faster than the conventional matrix multiplication. We study the method and we prove that the running time of this algorithm is truly less than the running time of the naive algorithm. We introduce an improvement and a generalization of this algorithm that have even smaller running times.

Finally, we analyze the numerical stability of these algorithms.

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