Gaussian Elimination Algorithm

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September 11, 1997

On the Wednesday, Sept. 3, 1997 Dr. Marcin Paprzycki, who is professor in the School of Mathematical Sciences of University of Southern Mississippi, gave us talk of "Comparisons of Gaussian Elimination Algorithms on a Cray Y-MP".

Dr. Marcin Paprzycki is a researcher in vast area of parallel computing. First, he said, Basic Linear Algebra Subprograms (BLAS) is very useful mathematical package. There are three level implementations. The first level deals with vector-vector operations. The second level deals with vector-matrix operations. The third level deals with matrix-matrix operations.

He said that A is an n by n real dense matrix using Gaussian elimination with partial pivoting. This method is good enough, but it lost some informations. The LU decomposition is more complex, because it keeps all informations, where L is lower triangular matrix with 1's on diagonal elements and U is upper triangular matrix.

The more effective method is Strassen's Algorithm. In 1969 Strassen showed that it is possible to multiply two matrices of size N by N with less than $4.7N^{log_2 7}$ arithmetic operations.