TRIDIAGONALIZATION OF A SYMMETRIC MATRIX ON A SQUARE ARRAY OF MESH-CONNECTED PROCESSORS

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Abstract

A parallel algorithm for transforming an $n \times n$ symmetric matrix to tridiagonal form is described. The algorithm implements Givens rotations on a square array of $n \times n$ processors in such a way that the transformation can be performed in time $O(n \log n)$. The processors require only nearest-neighbor communication. The reduction to tridiagonal form could be the first step in the parallel solution of the symmetric eigenvalue problem in time $O(n \log n)$.

Comments

Only the Abstract is given here. The full paper appeared as [1]. It is interesting that both the direct reduction to tridiagonal form, and the iterative eigenvalue computation by Jacobi-like methods [2], seem to require time $\Omega(n \log n)$. The choice of which approach to the symmetric eigenvalue problem is best may depend on details of the parallel machine architecture.

References

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