COMPUTATION OF THE GENERALIZED SINGULAR VALUE DECOMPOSITION USING MESH-CONNECTED PROCESSORS

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Abstract

This paper concerns the systolic array computation of the generalized singular value decomposition. Numerical algorithms for both one-dimensional and two-dimensional systolic architectures are discussed.

Comments

Only the Abstract is given here. The full paper appeared as [3]. For related work, see [1, 2, 4].

References

1. R. P. Brent, H. T. Kung and F. T. Luk, "Some linear-time algorithms for systolic arrays" (invited paper), in *Information Processing 83* (edited by R. E. A. Mason), North-Holland, Amsterdam, 1983, 865–876. rpb079.
2. R. P. Brent, F. T. Luk and C. F. Van Loan, "Computation of the singular value decomposition using mesh-connected processors", *J. of VLSI and Computer Systems* 1, 3 (1983–1985), 242–270. MR 86m:65033. rpb080.
3. R. P. Brent, F. T. Luk and C. F. Van Loan, "Computation of the generalized singular value decomposition using mesh-connected processors", *Proceedings SPIE, Volume 431, Real Time Signal Processing VI* (edited by Keith Bromley), SPIE, Bellingham, Washington, 1983, 66–71. Also appeared as Report TR 83-563, DCS, Cornell University, July 1983; and as Report CMA-R31-83, CMA, ANU, August 1983, 12 pp. rpb083.
4. R. P. Brent and F. T. Luk, "The solution of singular-value and symmetric eigenvalue problems on multiprocessor arrays", *SIAM J. Scientific and Statistical Computing* 6 (1985), 69–84. MR 86i:65089. rpb084.

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1991 *Mathematics Subject Classification.* Primary 65Y10; Secondary 47B35, 65F15, 65H17, 65Y05, 68Q22, 68Q25, 68Q35.

Key words and phrases. Systolic arrays, singular-value decomposition, SVD, generalized singular-value decomposition, GSVD, cyclic Jacobi method, real-time computation, VLSI.

The work of the second author was supported in part by the Nationall Science Foundation under grant MCS-8213718, and in part by the Centre for Mathematical Analysis, Australian National University.

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