Let's Design Algorithms for VLSI Systems


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Abstract

Very Large Scale Integration (VLSI) technology offers the potential of implementing complex algorithms directly in hardware [Mead and Conway 79]. This paper (i) gives examples of algorithms that we believe are suitable for VLSI implementation, (ii) provides a taxonomy for algorithms based on their communication structures, and (iii) discusses some of the insights that are beginning to emerge from our efforts in designing algorithms for VLSI systems.

Let us now examine how approximate algorithms may be constructed. A constructive method that for any given $\varepsilon$ provides the corresponding polynomial $\varepsilon$-approximate algorithm $A_\varepsilon$ is said to be a polynomial approximation scheme (PAS). If for every $\varepsilon$ the running time is bounded by $q(lxl,1/\varepsilon)$ for some polynomial $q$ we say that the scheme is a fully polynomial approximation scheme. A discussion of a large number of optimization problems which may be encountered in the optimal design of computer systems and a presentation of the basic algorithms for their exact or approximate solutions are given in - Papadimitrou,C.H. and K.Steiglitz: Combinatorial optimiza-. tion: Algorithms and complexiY3 Prentice Hall, 1982.