Loop Tiling for Parallelism (Hardback)

By Jingling Xue

Kluwer Academic Publishers, United States, 2000. Hardback. Book Condition: New. 2000 ed.. 239 x 155 mm. Language: English . Brand New Book ***** Print on Demand *****.Loop tiling, as one of the most important compiler optimizations, is beneficial for both parallel machines and uniprocessors with a memory hierarchy. This book explores the use of loop tiling for reducing communication cost and improving parallelism for distributed memory machines. The author provides mathematical foundations, investigates loop permutability in the framework of nonsingular loop transformations, discusses the necessary machineries required, and presents state-of-the-art results for finding communication- and time-minimal tiling choices. Throughout the book, theorems and algorithms are illustrated with numerous examples and diagrams. The techniques presented in Loop Tiling for Parallelism can be adapted to work for a cluster of workstations, and are also directly applicable to shared-memory machines once the machines are modeled as BSP (Bulk Synchronous Parallel) machines. Features and key topics: * Detailed review of the mathematical foundations, including convex polyhedra and cones; * Self-contained treatment of nonsingular loop transformations, code generation, and full loop permutability; * Tiling loop nests by rectangles and parallelepipeds, including their mathematical definition, dependence analysis, legality test, and code generation; * A complete suite...

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