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                 Lectures / / edited by Ulrich Meyer, Peter Sanders, Jop Sibeyn

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Disciplina   005.1

Soggetti   Computer engineering
                 Algorithms
                 Software engineering
                 Operating systems (Computers)
                 Data structures (Computer science)
                 Computer Engineering
                 Algorithm Analysis and Problem Complexity
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Nota di bibliografia   Includes bibliographical references and index.

Nota di contenuto   Memory Hierarchies — Models and Lower Bounds -- Basic External
                 Memory Data Structures -- A Survey of Techniques for Designing I/O-
                 Efficient Algorithms -- Elementary Graph Algorithms in External
                 Memory -- I/O-Efficient Algorithms for Sparse Graphs -- External
                 Memory Computational Geometry Revisited -- Full-Text Indexes in
                 External Memory -- Algorithms for Hardware Caches and TLB -- Cache
                 Oblivious Algorithms -- An Overview of Cache Optimization
                 Techniques and Cache-Aware Numerical Algorithms -- Memory
                 Limitations in Artificial Intelligence -- Algorithmic Approaches for
                 Storage Networks -- An Overview of File System Architectures --
                 Exploitation of the Memory Hierarchy in Relational DBMSs --
                 Hierarchical Models and Software Tools for Parallel Programming --

Case Study: Memory Conscious Parallel Sorting.

Sommario/riassunto

Algorithms that have to process large data sets have to take into account that the cost of memory access depends on where the data is stored. Traditional algorithm design is based on the von Neumann model where accesses to memory have uniform cost. Actual machines increasingly deviate from this model: while waiting for memory access, nowadays, microprocessors can in principle execute 1000 additions of registers; for hard disk access this factor can reach six orders of magnitude. The 16 coherent chapters in this monograph-like tutorial book introduce and survey algorithmic techniques used to achieve high performance on memory hierarchies; emphasis is placed on methods interesting from a theoretical as well as important from a practical point of view.