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Soggetti	Microprocessors Software engineering Computer communication systems Algorithms Computer science—Mathematics Bioinformatics Processor Architectures Software Engineering/Programming and Operating Systems Computer Communication Networks Algorithm Analysis and Problem Complexity Mathematics of Computing
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Nota di contenuto	Fluids and Structures -- Fluid-Structure Interaction Simulations Using Parallel Computers -- Investigation of Turbulent Flame Kernels Using DNS on Clusters -- A Parallel, State-of-the-Art, Least-Squares Spectral Element Solver for Incompressible Flow Problems -- Edge-Based Interface Elements for Solution of Three- Dimensional Geomechanical Problems -- Finite Element Simulation of Seismic Elastic Two Dimensional Wave Propagation: Development and Assessment of Performance in a Cluster of PCs with Software DSM -- Parallel Implementation for Probabilistic Analysis of 3D Discrete Cracking in

Concrete -- An A Posteriori Error Estimator for Adaptive Mesh Refinement Using Parallel In-Element Particle Tracking Methods -- Data Mining -- High Performance Data Mining -- Data Mining for Data Classification Based on the KNN-Fuzzy Method Supported by Genetic Algorithm -- Computing in Chemistry and Biology -- Lignin Biosynthesis and Degradation — a Major Challenge for Computational Chemistry -- High Performance Computing in Electron Microscope Tomography of Complex Biological Structures -- Visualization of RNA Pseudoknot Structures -- Problem Solving Environments -- The Cactus Framework and Toolkit: Design and Applications -- Performance of Message-Passing MATLAB Toolboxes -- Evaluating the Performance of Space Plasma Simulations Using FPGA's -- Remote Parallel Model Reduction of Linear Time-Invariant Systems Made Easy -- An Approach to Teaching Computer Arithmetic -- Linear and Non-linear Algebra -- Fast Sparse Matrix-Vector Multiplication for TeraFlop/s Computers -- Performance Evaluation of Parallel Gram-Schmidt Re-orthogonalization Methods -- Toward Memory-Efficient Linear Solvers -- A Parallel Newton-GMRES Algorithm for Solving Large Scale Nonlinear Systems -- Preconditioning for an Iterative Elliptic Solver on a Vector Processor -- 2-D R-Matrix Propagation: A Large Scale Electron Scattering Simulation Dominated by the Multiplication of Dynamically Changing Matrices -- A Parallel Implementation of the Atkinson Algorithm for Solving a Fredholm Equation -- SLEPc: Scalable Library for Eigenvalue Problem Computations -- Parallelization of Spectral Element Methods -- Cluster Computing -- Mapping Unstructured Applications into Nested Parallelism Best Student Paper Award: First Prize -- An Efficient Parallel and Distributed Algorithm for Counting Frequent Sets -- A Framework for Integrating Network Information into Distributed Iterative Solution of Sparse Linear Systems -- Efficient Hardware Implementation of Modular Multiplication and Exponentiation for Public-Key Cryptography -- Real-Time Visualization of Wake-Vortex Simulations Using Computational Steering and Beowulf Clusters -- PALM: A Dynamic Parallel Coupler -- A Null Message Count of a Conservative Parallel Simulation -- Imaging -- Static Scheduling with Interruption Costs for Computer Vision Applications -- A Parallel Rendering Algorithm Based on Hierarchical Radiosity -- A High-Performance Progressive Radiosity Method Based on Scene Partitioning -- Wavelet Transform for Large Scale Image Processing on Modern Microprocessors -- Software Tools and Environments -- An Expandable Parallel File System Using NFS Servers -- Scalable Multithreading in a Low Latency Myrinet Cluster -- Minimizing Paging Tradeoffs Applying Coscheduling Techniques in a Linux Cluster -- Introducing the Vector C -- Mobile Agent Programming for Clusters with Parallel Skeletons -- Translating Haskell# Programs into Petri Nets -- An Efficient Multi-processor Architecture for Parallel Cyclic Reference Counting -- ROS: The Rollback-One-Step Method to Minimize the Waiting Time during Debugging Long-Running Parallel Programs -- Distributed Paged Hash Tables -- A Meta-heuristic Approach to Parallel Code Generation -- Semidefinite Programming for Graph Partitioning with Preferences in Data Distribution -- A Development Environment for Multilayer Neural Network Applications Mapped onto DSPs with Multiprocessing Capabilities.

Sommario/riassunto

The 5th edition of the VECPAR series of conferences marked a change of the conference title. The full conference title now reads VECPAR 2002 — 5th Int- national Conference on High Performance Computing for Computational S- ence. This re?ects more accurately what has been the main emphasis of the conference since its early days in 1993 – the use of computers for solving pr- lems in science and engineering. The

present postconference book includes the best papers and invited talks presented during the three days of the conference, held at the Faculty of Engineering of the University of Porto (Portugal), June 26–28 2002. The book is organized into 8 chapters, which as a whole appeal to a wide research community, from those involved in the engineering applications to those interested in the actual details of the hardware or software implementation, in line with what, in these days, tends to be considered as Computational Science and Engineering (CSE). The book comprises a total of 49 papers, with a prominent position reserved for the four invited talks and the two ?rst prizes of the best student paper competition.