1. Record Nr. UNINA9910787572903321

Titolo	Designing scientific applications on GPUs / / edited by Raphael Couturier, University of Franche-Comte, Belfort, France
Pubbl/distr/stampa	Boca Raton, FL : , : CRC Press, , [2014] ©2014
ISBN	0-429-10085-X 1-4665-7162-4
Edizione	[1st edition]
Descrizione fisica	1 online resource (496 p.)
Collana	Chapman & Hall/CRC Numerical Analysis and Scientific Computing Series Chapman & Hall/CRC numerical analysis and scientific computing ; ; 21
Classificazione	MAT021000COM000000COM059000
Disciplina	006.6/63
Soggetti	Parallel programming (Computer science) Graphics processing units - Programming Science - Data processing Numerical analysis - Computer programs Application software - Development
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Front Cover; Contents; List of Figures; List of Tables; Preface; I. Presentation of GPUs; 1. Presentation of the GPU architecture and of the CUDA environment; 2. Introduction to CUDA; II. Image processing; 3. Setting up the environment; 4. Implementing a fast median filter; 5. Implementing an efficient convolution operation on GPU; III. Software development; 6. Development of software components for heterogeneous many-core architectures; 7. Development methodologies for GPU and cluster of GPUs; IV. Optimization; 8. GPU-accelerated tree-based exact optimization methods 9. Parallel GPU-accelerated metaheuristics10. Linear programming on a GPU: a case study; V. Numerical applications; 11. Fast hydrodynamics on heterogeneous many-core hardware; 12. Parallel monotone spline interpolation and approximation on GPUs; 13. Solving sparse linear systems with GMRES and CG methods on GPU clusters; 14. Solving sparse nonlinear systems of obstacle problems on GPU clusters; 15.

	Ludwig: multiple GPUs for a complex fluid lattice Boltzmann application; 16. Numerical validation and performance optimization on GPUs of an application in atomic physics 17. A GPU-accelerated envelope-following method for switching power converter simulationVI. Other; 18. Implementing multi-agent systems on GPU; 19. Pseudorandom number generator on GPU; 20. Solving large sparse linear systems for integer factorization on GPUs
Sommario/riassunto	This book covers designs of scientific applications for GPUs, beginning with a review of the principles of GPU programming. It then describes various scientific applications for GPUs and presents lessons learned. Scientific applications covered include computations on matrix operations, linear system solving, nonlinear system solving, image processing, and pseudo random number generation. Expert contributors discuss applications and the GPU porting in a pedagogical way, focusing their attention on the mechanisms they have used to obtain fast and interesting results--

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Record Nr.	UNINA9910254232503321
Autore	Sadowski Tomasz
Titolo	Loadings in Thermal Barrier Coatings of Jet Engine Turbine Blades : An Experimental Research and Numerical Modeling / / by Tomasz Sadowski, Przemysaw Golewski
Pubbl/distr/stampa	Singapore : , : Springer Singapore : , : Imprint : Springer, , 2016
ISBN	981-10-0919-8
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (110 p.)
Collana	SpringerBriefs in Computational Mechanics, , 2191-5342
Disciplina	629.134353
Soggetti	Mechanics Mechanics, Applied Materials science Mathematical models Machinery Solid Mechanics Characterization and Evaluation of Materials Mathematical Modeling and Industrial Mathematics Machinery and Machine Elements
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa

Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Preface; Acknowledgement; Contents; 1 Introduction; 2 Protective Thermal Barrier Coatings; 2.1 Structure of TBCs; 2.2 Development and Application of New Coating Materials; 2.3 Conclusions; References; 3 Thermal Loads; 3.1 Numerical Methods-Application of Finite Elements Method (FEM) [1, 2]; 3.2 Deformation and Stress in Structural Elements, Caused by Thermal Loads [1, 2]; 3.3 Numerical Analysis of Temperature Fields in Critical Elements of Turbo-Engines by CFD (Computational Fluid Dynamics) with Application of FLUENT Program; 3.4 Conclusions; References; 4 Mechanical Loads 4.1 Preparation of Model for Simulation4.2 Analysis of Results; 4.3 Blade Vibrations Resonance; 4.4 Conclusions; Reference; 5 Environmental Loads; 5.1 Corrosion; 5.2 Erosion; 5.3 Thermally Growth Oxide (TGO) Layer Growth; 5.4 Author's Own Tests of Moving Blade Surface, Including Chemical Analysis; 5.5 Conclusions; References; 6 State of Arts in Experimental Testing of TBCs Systems-Literature Analysis; 6.1 Review and Analysis of Currently Utilised Tests; 6.2 Conclusions; References; 7 Proposed Experimental Investigations of TBCs Systems; 7.1 Sample Ageing 7.2 Uniaxial Stretching of Dumbbell Samples with TBC Layers-Author's Own Tests7.2.1 First Batch of Samples Not Subjected to Ageing; 7.2.2 Second Batch of Samples Subjected to Ageing; 7.3 3-Point Bending of Beam Samples with TBC Layers-Author's Own Tests; 7.4 Conclusions; 8 Numerical Analysis of Cracks Propagation Process in Turbine Blades TBCs Systems Under Thermo-Mechanical Loading Based on Experimental Results; 8.1 Formulation of FEM Approach and Brittle Damage of the TBCs System; 8.1.1 Brittle Damage Model; 8.1.2 Cohesive Degradation Model; 8.1.3 Simulation Results 8.2 Application of Submodeling Technique and X-FEM Methods for Detailed Analysis of Cracking Process in Turbine Blades TBCs8.2.1 Submodeling; 8.2.2 X-FEM Method Basics; 8.2.3 Preparation of Model for Simulation; 8.3 Analysis of Results; 8.4 Conclusions; References; 9 Summary
Sommario/riassunto	This book discusses complex loadings of turbine blades and protective layer Thermal Barrier Coating (TBC), under real working airplane jet conditions. They obey both multi-axial mechanical loading and sudden temperature variation during starting and landing of the airplanes. In particular, two types of blades are analyzed: stationary and rotating, which are widely applied in turbine engines produced by airplane factories.