1. Record Nr.   UNINA9910254310203321

   Titolo   Model Reduction of Parametrized Systems / / edited by Peter Benner,
                     Mario Ohlberger, Anthony Patera, Gianluigi Rozza, Karsten Urban

   Pubbl/distr/stampa Cham : , : Springer International Publishing : , : Imprint : Springer, ,
                     2017

   ISBN   3-319-58786-2

   Edizione   [1st ed. 2017.]

   Descrizione fisica 1 online resource (XII, 504 p.)

   Collana   MS&A, Modeling, Simulation and Applications, , 2037-5255 ; ; 17

   Disciplina   518

   Soggetti   Computer mathematics
                     Numerical analysis
                     Applied mathematics
                     Engineering mathematics
                     Mechanics
                     Mechanics, Applied
                     Partial differential equations
                     Computational Mathematics and Numerical Analysis
                     Numeric Computing
                     Mathematical and Computational Engineering
                     Solid Mechanics
                     Partial Differential Equations

   Lingua di pubblicazione   Inglese

   Formato   Materiale a stampa

   Livello bibliografico   Monografia

   Nota di bibliografia   Includes bibliographical references.

   Nota di contenuto 1 Two ways to treat time in Reduced Basis Methods -- 2 Simultaneous
                      empirical interpolation and reduced basis method. Application to non-
                      linear multi-physics problem -- 3 A Certified Reduced Basis Approach
                      for Parametrized Optimal Control Problems with Two-sided Control
                      Constraints -- 4 A reduced basis method with an exact solution
                      certificate and spatio-parameter adaptivity: application to linear
                      elasticity -- 5 A Reduced Basis Method for Parameter Functions using
                      Wavelet Approximations -- 6 Reduced basis isogeometric mortar
                      approximations for eigenvalue problems in vibroacoustics -- 7
                      Reduced Basis Approximations for Maxwell's Equations in Dispersive

Media -- 8 Offline Error Bounds for the Reduced Basis Method -- 9 ArbiLoMod: Local Solution Spaces by Random Training in Electrodynamics -- 10 Reduced-order semi-implicit schemes for fluid-structure interaction problems -- 11 True Error Control for the Localized Reduced Basis Method for Parabolic Problems -- 12 Automatic reduction of PDEs defined on domains with variable shape -- 13 Localized Reduced Basis Approximation of a Nonlinear Finite Volume Battery Model with Resolved Electrode Geometry -- 14 A-posteriori error estimation of discrete POD models for PDE-constrained optimal control -- 15 Hi-POD solution of parametrized fluid dynamics problems: preliminary results -- 16 Adaptive sampling for nonlinear dimensionality reduction based on manifold learning -- 17 Cross-Gramian-Based Model Reduction: A Comparison -- 18 Truncated Gramians for Bilinear Systems and their Advantages in Model Order Reduction -- 19 Leveraging Sparsity and Compressive Sensing for Reduced Order Modeling -- 20 A HJB-POD approach to the control of the level set equation -- 21 Model order reduction approaches for infinite horizon optimal control problems via the HJB equation -- 22 Interpolatory methods for H model reduction of multi-input/multi-output systems -- 23 Model reduction of linear time-varying systems with applications for moving loads -- 24 Interpolation Strategy for BT-based Parametric MOR of Gas Pipeline-Networks -- 25 Energy stable model order reduction for the Allen-Cahn equation -- 26 MOR-based Uncertainty Quantification in Transcranial Magnetic Stimulation -- 27 Model Order Reduction of Nonlinear Eddy Current Problems using Missing Point Estimation -- 28 On Efficient Approaches for Solving a Cake Filtration Model under Parameter Variation -- 29 Model reduction for coupled near-well and reservoir models using multiple space-time discretizations -- 30 Time-dependent Parametric Model Order Reduction for Material Removal Simulations .

| Sommario/riassunto | The special volume offers a global guide to new concepts and approaches concerning the following topics: reduced basis methods, proper orthogonal decomposition, proper generalized decomposition, approximation theory related to model reduction, learning theory and compressed sensing, stochastic and high-dimensional problems, system-theoretic methods, nonlinear model reduction, reduction of coupled problems/multiphysics, optimization and optimal control, state estimation and control, reduced order models and domain decomposition methods, Krylov-subspace and interpolatory methods, and applications to real industrial and complex problems. The book represents the state of the art in the development of reduced order methods. It contains contributions from internationally respected experts, guaranteeing a wide range of expertise and topics. Further, it reflects an important effor t, carried out over the last 12 years, to build a growing research community in this field. Though not a textbook, some of the chapters can be used as reference materials or lecture notes for classes and tutorials (doctoral schools, master classes). |