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	Titolo	Proper Generalized Decompositions : An Introduction to Computer Implementation with Matlab / / by Elías Cueto, David González, Iciar Alfaro
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- 2 To begin with: PGD for Poisson problems -- 2.1 Introduction -- 2.2 The Poisson problem -- 2.3 Matrix structure of the problem -- 2.4 Matlab code for the Poisson problem -- 3 Parametric problems -- 3.1 A particularly challenging problem: a moving load as a parameter -- 3.2 The problem under the PGD formalism -- 3.2.1 Computation of $S(s)$ assuming $R(x)$ is known -- 3.2.2 Computation of $R(x)$ assuming $S(s)$ is known -- 3.3 Matrix structure of the problem -- 3.4 Matlab code for the influence line problem -- 4 PGD for non-linear problems -- 4.1 Hyperelasticity -- 4.2 Matrix structure of the problem -- 4.2.1 Matrix form of the term T_2 -- 4.2.2 Matrix form of the term T_4 -- 4.2.3 Matrix form of the term T_6 -- 4.2.4 Matrix form for the term T_8 -- 4.2.5 Matrix form of the term T_9 -- 4.2.6 Matrix form of the term T_{10} -- 4.2.7 Final comments -- 4.3 Matlab code -- 5 PGD for dynamical problems -- 5.1 Taking initial conditions as parameters -- 5.2 Developing the weak form of the problem -- 5.3 Matrix form of the problem -- 5.3.1 Time integration of the equations of motion -- 5.3.2 Computing a reduced-order basis for the field of initial conditions -- 5.3.3 Projection of the equations onto a reduced, parametric basis -- 5.4 Matlab code -- References -- Index. .
Sommario/riassunto	This book is intended to help researchers overcome the entrance barrier to Proper Generalized Decomposition (PGD), by providing a valuable tool to begin the programming task. Detailed Matlab Codes are included for every chapter in the book, in which the theory previously described is translated into practice. Examples include parametric problems, non-linear model order reduction and real-time simulation, among others. Proper Generalized Decomposition (PGD) is a method for numerical simulation in many fields of applied science and engineering. As a generalization of Proper Orthogonal Decomposition or Principal Component Analysis to an arbitrary number of dimensions, PGD is able to provide the analyst with very accurate solutions for problems defined in high dimensional spaces, parametric problems and even real-time simulation. .