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Nota di contenuto	T. Akman et al: Space-Time Discontinuous Galerkin Methods for Optimal Control Problems Governed by Time Dependent Diffusion-Convection-Reaction Equations -- Th. Carraro et al: Direct and Indirect Multiple Shooting for Parabolic Optimal Control Problems -- M.J.

Gander: 50 Years of Time Parallel Time Integration -- S. Grötschel et al: Reducing Memory Requirements in Scientific Computing and Optimal Control -- Y. Hasegawa: Optimal Control of Heat and Fluid Flow for Efficient Energy Utilization -- D. Janka et al: Direct Multiple Shooting for Optimum Experimental Design -- D. Kaschek et al: A Unified Approach to Integration and Optimization of Parametric Ordinary Differential Equations -- R. Kircheis et al: Parameter Estimation for PDAE Constrained Models Using a Reduced Approach -- M. Klinger: A Variational Approach for Physically Based Image Interpolation Across Boundaries -- C. Kreutz et al: Statistics for Model Calibration -- A. Potschka: Direct Multiple Shooting for Parabolic PDE Constrained Optimization -- R. Quirynen et al: Multiple Shooting in a Microsecond -- Th. Richter et al: Time Discretizations of Fluid-Structure Interactions -- St. Ulbrich: Preconditioners Based on 'Parareal' Time-Domain Decomposition for Time-Dependent PDE-Constrained Optimization -- E. Kostina et al: Direct Multiple Shooting for Optimization Problems in ODE Models -- M. Schlick: Parareal Time-Stepping for Limit-Cycle Computation of the Incompressible Navier-Stokes Equations with Uncertain Periodic Dynamics.

Sommario/riassunto

This book offers a comprehensive collection of the most advanced numerical techniques for the efficient and effective solution of simulation and optimization problems governed by systems of time-dependent differential equations. The contributions present various approaches to time domain decomposition, focusing on multiple shooting and parareal algorithms. The range of topics covers theoretical analysis of the methods, as well as their algorithmic formulation and guidelines for practical implementation. Selected examples show that the discussed approaches are mandatory for the solution of challenging practical problems. The practicability and efficiency of the presented methods is illustrated by several case studies from fluid dynamics, data compression, image processing and computational biology, giving rise to possible new research topics. This volume, resulting from the workshop Multiple Shooting and Time Domain Decomposition Methods, held in Heidelberg in May 2013, will be of great interest to applied mathematicians, computer scientists and all scientists using mathematical methods.