

Jochen Garcke • Dirk Pflüger
Editors

Sparse Grids and Applications – Stuttgart 2014

 Springer

Contents

Adaptive Sparse Grid Model Order Reduction for Fast Bayesian Estimation and Inversion	1
Peng Chen and Christoph Schwab	
From Data to Uncertainty: An Efficient Integrated Data-Driven Sparse Grid Approach to Propagate Uncertainty	29
Fabian Franzelin and Dirk Pflüger	
Combination Technique Based Second Moment Analysis for Elliptic PDEs on Random Domains	51
Helmut Harbrecht and Michael Peters	
Adaptive Sparse Grids and Extrapolation Techniques	79
Brendan Harding	
A Cache-Optimal Alternative to the Unidirectional Hierarchization Algorithm	103
Philipp Hupp and Riko Jacob	
Spatially-Dimension-Adaptive Sparse Grids for Online Learning	133
Valeriy Khakhutskyy and Markus Hegland	
Sparse Grids for the Vlasov–Poisson Equation	163
Katharina Kormann and Eric Sonnendrücker	
An Adaptive Sparse Grid Algorithm for Elliptic PDEs with Lognormal Diffusion Coefficient	191
Fabio Nobile, Lorenzo Tamellini, Francesco Tesei, and Raúl Tempone	
A New Subspace-Based Algorithm for Efficient Spatially Adaptive Sparse Grid Regression, Classification and Multi-evaluation ...	221
David Pfander, Alexander Heinecke, and Dirk Pflüger	

High-Dimensional Stochastic Design Optimization by Adaptive-Sparse Polynomial Dimensional Decomposition 247
Sharif Rahman, Xuchun Ren, and Vaibhav Yadav

Efficient Spectral-Element Methods for the Electronic Schrödinger Equation 265
Jie Shen, Yingwei Wang, and Haijun Yu

A Sparse Grid Method for Bayesian Uncertainty Quantification with Application to Large Eddy Simulation Turbulence Models 291
Hoang Tran, Clayton G. Webster, and Guannan Zhang

Hierarchical Gradient-Based Optimization with B-Splines on Sparse Grids 315
Julian Valentin and Dirk Pflüger