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Nota di contenuto	Front matter -- Preface -- Editor's Preface -- Contents -- Part I. Introduction -- Chapter 1. Inverse Problems of Mathematical Physics / Kabanikhin, S. I. -- Part II. Recent Advances in Regularization Theory and Methods -- Chapter 2. Using Parallel Computing for Solving Multidimensional Ill-posed Problems / Lukyanenko, D. V. / Yagola, A. G. -- Chapter 3. Regularization of Fredholm Integral Equations of the First Kind using Nyström Approximation / Nair, M. T. -- Chapter 4. Regularization of Numerical Differentiation: Methods and Applications / Xiao, T. Y. / Zhang, H. / Hao, L. L. -- Chapter 5. Numerical Analytic Continuation and Regularization / Fu, C. L. / Cheng, H. / Ma, Y. J. -- Chapter 6. An Optimal Perturbation Regularization Algorithm for Function Reconstruction and Its Applications / Li, G. S. -- Chapter 7. Filtering and Inverse Problems Solving / Zotov, L. V. / Panteleev, V. L. -- Part III. Optimal Inverse Design and Optimization Methods -- Chapter 8. Inverse Design of Alloys' Chemistry for Specified Thermo-Mechanical Properties by using Multi-objective Optimization /

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Sommario/riassunto

Nowadays inverse problems and applications in science and engineering represent an extremely active research field. The subjects are related to mathematics, physics, geophysics, geochemistry, oceanography, geography and remote sensing, astronomy, biomedicine, and other areas of applications. This monograph reports recent advances of inversion theory and recent developments with practical applications in frontiers of sciences, especially inverse design and novel computational methods for inverse problems. The practical applications include inverse scattering, chemistry, molecular spectra data processing, quantitative remote sensing inversion, seismic imaging, oceanography, and astronomical imaging. The book serves as a reference book and readers who do research in applied mathematics, engineering, geophysics, biomedicine, image processing, remote sensing, and environmental science will benefit from the contents since the book incorporates a background of using statistical and non-statistical methods, e.g., regularization and optimization techniques for solving practical inverse problems.
