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Methods; 4.1. Metropolis algorithm; 4.2. Heat bath algorithm; 4.3. Simulated annealing without rejected moves; 4.4. Fast simulated annealing; 4.5. Very fast simulated reannealing; 4.6. Mean; 4.7. Using SA in geophysical inversion; 4.8. Summary; Chapter 5. Genetic Algorithms; 5.1. A classical GA; 5.2. Schemata and the fundamental theorem of genetic algorithms; 5.3. Problems; 5.4. Combining elements of SA into a new GA; 5.5. A mathematical model of a GA; 5.6. Multimodal fitness functions, genetic drift; 5.7. Uncertainty estimates 5.8. Evolutionary programming5.9. Summary; Chapter 6. Geophysical Applications of SA and G A; 6.1. 1-D Seismic waveform inversion; 6.2. Pre-stack migration velocity estimation; 6.3. Inversion of resistivity sounding data for 1-D earth models; 6.4. Inversion of resistivity profiling data for 2-D earth models; 6.5. Inversion of magnetotelluric sounding data for 1-D earth models; 6.6. Stochastic reservoir modeling; 6.7. Seismic deconvolution by mean field annealing and Hopfield network; Chapter 7. Uncertainty Estimation; 7.1. Methods of Numerical Integration
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Sommario/riassunto

One of the major goals of geophysical inversion is to find earth models that explain the geophysical observations. Thus the branch of mathematics known as optimization has found significant use in many geophysical applications. Both local and global optimization methods are used in the estimation of material properties from geophysical data. As the title of the book suggests, the aim of this book is to describe the application of several recently developed global optimization methods to geophysical problems. The well known linear and gradient based optimization methods have been summar
