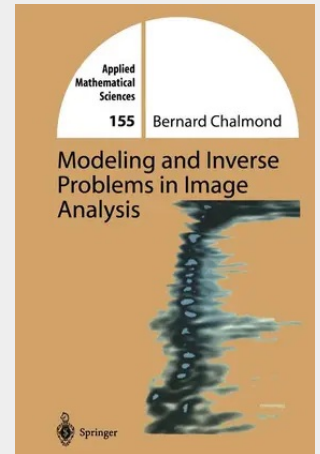


Modeling and Inverse Problems in Imaging Analysis

More mathematicians have been taking part in the development of digital image processing as a science and the contributions are reflected in the increasingly important role modeling has played solving complex problems. This book is mostly concerned with energy-based models. Through concrete image analysis problems, the author develops consistent modeling, a know-how generally hidden in the proposed solutions. The book is divided into three main parts. The first two parts describe the materials necessary to the models expressed in the third part. These materials include splines (variational approach, regression spline, spline in high dimension), and random fields (Markovian field, parametric estimation, stochastic and deterministic optimization, continuous Gaussian field). Most of these models come from industrial projects in which the author was involved in robot vision and radiography: tracking 3D lines, radiographic image processing, 3D reconstruction and tomography, matching, deformation learning. Numerous graphical illustrations accompany the text showing the performance of the proposed models. This book will be useful to researchers and graduate students in applied mathematics, computer vision, and physics.

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