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Titolo	Handbook of Mathematical Models and Algorithms in Computer Vision and Imaging : Mathematical Imaging and Vision / / edited by Ke Chen, Carola-Bibiane Schönlieb, Xue-Cheng Tai, Laurent Younes
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Disciplina	006.37
Soggetti	Mathematics - Data processing Image processing - Digital techniques Computer vision Mathematical optimization Mathematical analysis Neural networks (Computer science) Computational Mathematics and Numerical Analysis Computer Imaging, Vision, Pattern Recognition and Graphics Optimization Analysis Mathematical Models of Cognitive Processes and Neural Networks Models matemàtics Visió per ordinador Diagnòstic per la imatge Optimització matemàtica Llibres electrònics
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. An Overview of SaT Segmentation Methodology and Its Applications in Image Processing -- 2. Analysis of different losses for deep learning image colorization -- 3. Blind phase retrieval with fast algorithms -- 4.

Bregman Methods for Large-Scale Optimisation with Applications in Imaging -- 5. Connecting Hamilton-Jacobi Partial Differential Equations with Maximum a Posteriori and Posterior Mean Estimators for Some Non-convex Priors -- 6. Convex non-Convex Variational Models -- 7. Data-Informed Regularization for Inverse and Imaging Problems -- 8. Diffraction Tomography, Fourier Reconstruction, and Full Waveform Inversion -- 9. Domain Decomposition for Non-smooth (in Particular TV) Minimization -- 10. Fast numerical methods for image segmentation models.

Sommario/riassunto

This handbook gathers together the state of the art on mathematical models and algorithms for imaging and vision. Its emphasis lies on rigorous mathematical methods, which represent the optimal solutions to a class of imaging and vision problems, and on effective algorithms, which are necessary for the methods to be translated to practical use in various applications. Viewing discrete images as data sampled from functional surfaces enables the use of advanced tools from calculus, functions and calculus of variations, and nonlinear optimization, and provides the basis of high-resolution imaging through geometry and variational models. Besides, optimization naturally connects traditional model-driven approaches to the emerging data-driven approaches of machine and deep learning. No other framework can provide comparable accuracy and precision to imaging and vision. Written by leading researchers in imaging and vision, the chapters in this handbook all start with gentle introductions, which make this work accessible to graduate students. For newcomers to the field, the book provides a comprehensive and fast-track introduction to the content, to save time and get on with tackling new and emerging challenges. For researchers, exposure to the state of the art of research works leads to an overall view of the entire field so as to guide new research directions and avoid pitfalls in moving the field forward and looking into the next decades of imaging and information services. This work can greatly benefit graduate students, researchers, and practitioners in imaging and vision; applied mathematicians; medical imagers; engineers; and computer scientists.