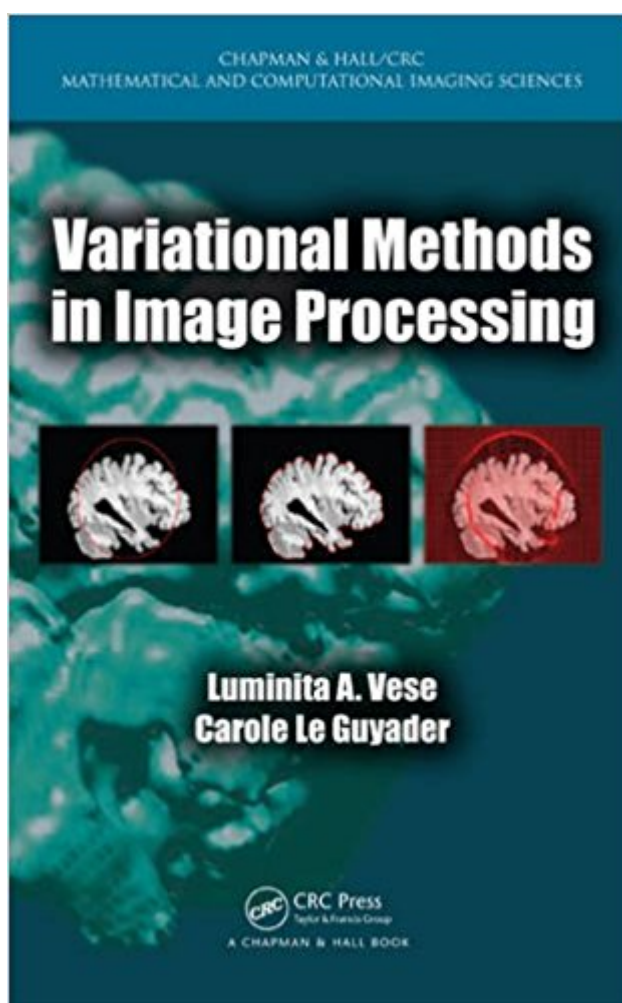


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# Variational Methods In Image Processing (Chapman & Hall/CRC Mathematical And Computational Imaging Sciences Series)



## Synopsis

Variational Methods in Image Processing presents the principles, techniques, and applications of variational image processing. The text focuses on variational models, their corresponding Euler–Lagrange equations, and numerical implementations for image processing. It balances traditional computational models with more modern techniques that solve the latest challenges introduced by new image acquisition devices. The book addresses the most important problems in image processing along with other related problems and applications. Each chapter presents the problem, discusses its mathematical formulation as a minimization problem, analyzes its mathematical well-posedness, derives the associated Euler–Lagrange equations, describes the numerical approximations and algorithms, explains several numerical results, and includes a list of exercises. MATLAB® codes are available online. Filled with tables, illustrations, and algorithms, this self-contained textbook is primarily for advanced undergraduate and graduate students in applied mathematics, scientific computing, medical imaging, computer vision, computer science, and engineering. It also offers a detailed overview of the relevant variational models for engineers, professionals from academia, and those in the image processing industry.

## Book Information

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"The book's contents are very well prepared for graduate-level students or advanced

undergraduates who work in the field of mathematical image processing and computer vision. The book is also an indispensable resource for engineers and professionals in the image processing industry looking to adopt innovative concepts. Compared to existing textbooks, this one offers a useful view as it covers the fundamentals and many specific applications together in one place, balancing the traditional computational models with the more modern techniques developed to answer new challenges introduced by the new image acquisition devices."

— Dr. Jalal Fadili, *École Nationale Supérieure d'Ingénieurs de Caen* "A very educational and a useful source of reference and inspiration for advanced undergraduate and graduate students in applied mathematics and/or computer vision as well for academic researchers or engineers from the image processing industry."

— Gilles Aubert, Professor of Mathematics, University of Nice-Sophia Antipolis "This book will be immensely useful both as a reference and textbook, as it presents the fundamentals of variational methods in image processing. It covers all aspects of variational methods in image processing, with essential applications. Homework problems are also given at the end of each chapter. This book could be used as a textbook for a graduate course on variational methods in image processing. It will also be a reference book to researchers in the field."

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