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Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	1. Introduction -- Part I: Analytical and Numerical Foundations -- 2. Analytical Background -- 3. FEM for Linear Problems -- 4. Concepts for Discretized Problems -- Part II: Approximation of Classical Formulations -- 5. The Obstacle Problem -- 6. The Allen-Cahn Equation -- 7. Harmonic Maps -- 8. Bending Problems -- Part III: Methods for Extended Formulations -- 9. Nonconvexity and Microstructure -- 10. Free Discontinuities -- 11. Elastoplasticity -- Auxiliary Routines -- Frequently Used Notation -- Index.
Sommario/riassunto	The description of many interesting phenomena in science and engineering leads to infinite-dimensional minimization or evolution problems that define nonlinear partial differential equations. While the

development and analysis of numerical methods for linear partial differential equations is nearly complete, only few results are available in the case of nonlinear equations. This monograph devises numerical methods for nonlinear model problems arising in the mathematical description of phase transitions, large bending problems, image processing, and inelastic material behavior. For each of these problems the underlying mathematical model is discussed, the essential analytical properties are explained, and the proposed numerical method is rigorously analyzed. The practicality of the algorithms is illustrated by means of short implementations.