Título: Semismooth Newton Methods For Variational Inequalities And Constrained Optimizat

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Sinopsis

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Semismooth Newton methods are a modern class of remarkably powerful and versatile algorithms for solving constrained optimization problems with partial differential equations (PDEs), variational inequalities, and related problems. This book provides a comprehensive presentation of these methods in function spaces, striking a balance between thoroughly developed theory and numerical applications.

Although largely self-contained, the book also covers recent developments in the field, such as state-constrained problems, and offers new material on topics such as improved mesh independence results. The theory and methods are applied to a range of practically important problems, including
? optimal control of nonlinear elliptic differential equations,
? obstacle problems, and
? flow control of instationary Navier?Stokes fluids.

In addition, the author covers adjoint-based derivative computation and the efficient solution of Newton systems by multigrid and preconditioned iterative methods.

Audience
This book is appropriate for researchers and practitioners in PDE-constrained optimization, nonlinear optimization, and numerical analysis, as well as engineers interested in the current theory and methods for solving variational inequalities. It is also suitable as a text for an advanced graduate-level course in the aforementioned topics or applied functional analysis.

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