Theoretical Numerical Analysis [A Functional Analysis Framework /

Atkinson, Kendall

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Monografía

This textbook prepares graduate students for research in numerical analysis/computational mathematics by giving to them a mathematical framework embedded in functional analysis and focused on numerical analysis. This helps the student to move rapidly into a research program. The text covers basic results of functional analysis, approximation theory, Fourier analysis and wavelets, iteration methods for nonlinear equations, finite difference methods, Sobolev spaces and weak formulations of boundary value problems, finite element methods, elliptic variational inequalities and their numerical solution, numerical methods for solving integral equations of the second kind, and boundary integral equations for planar regions. The presentation of each topic is meant to be an introduction with certain degree of depth. Comprehensive references on a particular topic are listed at the end of each chapter for further reading and study. In this new edition many sections from the first edition have been revised to varying degrees as well as over 140 new exercises added. A new chapter on Fourier Analysis and wavelets has been included. Review of earlier edition: "...the book is clearly written, quite pleasant to read, and contains a lot of important material; and the authors have done an excellent job at balancing theoretical developments, interesting examples and exercises, numerical experiments, and bibliographical references." R. Glowinski, SIAM Review, 2003

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