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Sinopsis

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This unique book provides an introduction to a subject whose use has steadily increased over the past 40 years. An update of Ramon Moore?s previous books on the topic, it provides broad coverage of the subject as well as the historical perspective of one of the originators of modern interval analysis. The authors provide a hands-on introduction to INTLAB, a high-quality, comprehensive MATLAB® toolbox for interval computations, making this the first interval analysis book that does with INTLAB what general numerical analysis texts do with MATLAB.

Readers will find the following features of interest: elementary motivating examples and notes that help maximize the reader?s chance of success in applying the techniques; exercises and hands-on MATLAB-based examples woven into the text; INTLAB-based examples and explanations integrated into the text, along with a comprehensive set of exercises and solutions, and an appendix with INTLAB commands; an extensive bibliography and appendices that will continue to be valuable resources once the reader is familiar with the subject; and a Web page with links to computational tools and other resources of interest.

Audience
Introduction to Interval Analysis will be valuable to engineers and scientists interested in scientific computation, especially in reliability, effects of roundoff error, and automatic verification of results. The introductory material is particularly important for experts in global optimization and constraint solution algorithms. This book is suitable for introducing the subject to students in these areas.

Contents
Preface
Contents
Index

About the Authors

Ramon E. Moore authored Interval Analysis (Prentice-Hall, 1966), Methods and Applications of Interval Analysis (SIAM, 1979), and numerous related publications. Now retired, he was professor of computer science and/or mathematics from 1965 through 2000 at universities in Ohio, Texas, and Wisconsin as well as visiting professor in Stockholm, Oxford, Karlsruhe, and Freiburg. From 1950 until 1965 he worked in the area of computational mathematics at Aberdeen Proving Grounds, UC Radiation Lab in Livermore, and Lockheed Research Labs in Palo Alto. He received an Alexander von Humboldt Foundation-US Senior Scientist Award in 1975.

R. Baker Kearfott has authored a monograph on mathematically rigorous numerical methods for nonlinear algebraic systems of equations and nonlinear optimization problems, organized a major international conference on interval computations, edited several conference volumes, and provided several software packages for interval computations. He has been on the faculty of the University of Louisiana at Lafayette since 1977 and has participated in various modeling projects at the University of Louisiana and while at Exxon Research and Engineering.

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Keywords
interval analysis; scientific computing; automatic result verification; bounding ranges; numerical analysis