Least Squares Data Fitting with Applications

By Per Christian Hansen, Víctor Pereyra, Godela Scherer

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As one of the classical statistical regression techniques, and often the first to be taught to new students, least squares fitting can be a very effective tool in data analysis. Given measured data, we establish a relationship between independent and dependent variables so that we can use the data predictively. The main concern of *Least Squares Data Fitting with Applications* is how to do this on a computer with efficient and robust computational methods for linear and nonlinear relationships. The presentation also establishes a link between the statistical setting and the computational issues.

In a number of applications, the accuracy and efficiency of the least squares fit is central, and Per Christian Hansen, Víctor Pereyra, and Godela Scherer survey modern computational methods and illustrate them in fields ranging from engineering and environmental sciences to geophysics. Anyone working with problems of linear and nonlinear least squares fitting will find this book invaluable as a hands-on guide, with accessible text and carefully explained problems.

Included are• an overview of computational methods together with their properties and advantages• topics from statistical regression analysis that help readers to understand and evaluate the computed solutions• many examples that illustrate the techniques and algorithms

Least Squares Data Fitting with Applications can be used as a textbook for advanced undergraduate or graduate courses and professionals in the sciences and in engineering.

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Editorial Review

Review

Least squares remains a key topic in scientific computing, serving as a vital bridge between data and models. This book describes many interesting aspects of this problem class, including its statistical foundations, algorithms for solving both linear and nonlinear models, and its applications to many disciplines. The authors convey both the rich history of the subject and its ongoing importance.

(Stephen Wright, University of Wisconsin–Madison)

Least Square Data fitting with Applications is a book that will be of great practical use to anyone whose work involves the analysis of data and its modeling. It offers a great deal of information that can be a s valuable in the lecture theater as in the lab or office.

(*Mathematics Today*)

About the Author

Per Christian Hansen is a professor of scientific computing at the Technical University of Denmark. **Víctor Pereyra** is a consulting professor of energy resources engineering at Stanford University and was a principal at Weidlinger Associates, Los Altos, California. **Godela Scherer** is a visiting research fellow in the Department of Mathematics at the University of Reading, United Kingdom, and a professor of scientific computing at the Universidad Simón Bolívar, Venezuela.

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