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Nota di contenuto	Statistical Robust Design; Contents; Preface; 1 What is robust design?; 1.1 The importance of small variation; 1.2 Variance reduction; 1.3 Variation propagation; 1.4 Discussion; 1.4.1 Limitations; 1.4.2 The outline of this book; Exercises; 2 DOE for robust design, part 1; 2.1 Introduction; 2.1.1 Noise factors; 2.1.2 Control factors; 2.1.3 Control-by-noise interactions; 2.2 Combined arrays: An example from the packaging industry; 2.2.1 The experimental array; 2.2.2 Factor effect plots; 2.2.3 Analytical analysis and statistical significance; 2.2.4 Some additional comments on the plotting 2.3 Dispersion effects Exercises; Reference; 3 Noise and control factors; 3.1 Introduction to noise factors; 3.1.1 Categories of noise; 3.2 Finding the important noise factors; 3.2.1 Relating noise to failure modes; 3.2.2 Reducing the number of noise factors; 3.3 How to include noise in a designed experiment; 3.3.1 Compounding of noise factors; 3.3.2 How to include noise in experimentation; 3.3.3 Process parameters; 3.4 Control factors; Exercises; References; 4 Response, signal, and P diagrams; 4.1 The idea of signal and response; 4.1.1 Two situations; 4.2 Ideal functions and P diagrams 4.2.1 Noise or signal factor 4.2.2 Control or signal factor; 4.2.3 The

scope; 4.3 The signal; 4.3.1 Including a signal in a designed experiment; Exercises; 5 DOE for robust design, part 2; 5.1 Combined and crossed arrays; 5.1.1 Classical DOE versus DOE for robust design; 5.1.2 The structure of inner and outer arrays; 5.2 Including a signal in a designed experiment; 5.2.1 Combined arrays with a signal; 5.2.2 Inner and outer arrays with a signal; 5.3 Crossed arrays versus combined arrays; 5.3.1 Differences in factor aliasing; 5.4 Crossed arrays and split-plot designs
8 Mathematics of robust design 8.1 Notational system; 8.2 The objective function; 8.2.1 Multidimensional problems; 8.2.2 Optimization in the presence of a signal; 8.2.3 Matrix formulation; 8.2.4 Pareto optimality; 8.3 ANOVA for robust design; 8.3.1 Traditional ANOVA; 8.3.2 Functional ANOVA; 8.3.3 Sensitivity indices; Exercises; References; 9 Design and analysis of computer experiments; 9.1 Overview of computer experiments; 9.1.1 Robust design; 9.2 Experimental arrays for computer experiments; 9.2.1 Screening designs; 9.2.2 Space filling designs; 9.2.3 Latin hypercubes 9.2.4 Latin hypercube designs and alphabetical optimality criteria

Sommario/riassunto

Robust Design is an important topic in many areas of the manufacturing industry, there is little on the market that provides adequate coverage. This book deals with the statistical theory of how to design products to be robust against random variation in "noise". It adopts a practice-oriented approach to robust design, digressing from the traditional Taguchi approach. Examples featured are taken from an industrial setting to illustrate how to make use of statistics to identify robust design solutions.
