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Nota di contenuto	Statistical Design and Analysis of Experiments; Preface; Contents; PART I FUNDAMENTAL STATISTICAL CONCEPTS; 1. Statistics in Engineering and Science; 1.1. The Role of Statistics in Experimentation; 1.2. Populations and Samples; 1.3. Parameters and Statistics; 1.4. Mathematical and Statistical Modeling; Exercises; 2. Fundamentals of Statistical Inference; 2.1. Traditional Summary Statistics; 2.2. Statistical Inference; 2.3. Probability Concepts; 2.4. Interval Estimation; 2.5. Statistical Tolerance Intervals; 2.6. Tests of Statistical Hypotheses; 2.7.

Sample Size and Power

Appendix: Probability CalculationsExercises; 3. Inferences on Means and Standard Deviations; 3.1. Inferences on a Population or Process Mean; 3.1.1. Confidence Intervals; 3.1.2. Hypothesis Tests; 3.1.3. Choice of a Confidence Interval or a Test; 3.1.4. Sample Size; 3.2. Inferences on a Population or Process Standard Deviation; 3.2.1. Confidence Intervals; 3.2.2. Hypothesis Tests; 3.3. Inferences on Two Populations or Processes Using Independent Pairs of Correlated Data Values; 3.4. Inferences on Two Populations or Processes Using Data from Independent Samples

3.5. Comparing Standard Deviations from Several PopulationsExercises; PART II DESIGN AND ANALYSIS WITH FACTORIAL STRUCTURE; 4. Statistical Principles in Experimental Design; 4.1. Experimental-Design Terminology; 4.2. Common Design Problems; 4.2.1. Masking Factor Effects; 4.2.2. Uncontrolled Factors; 4.2.3. Erroneous Principles of Efficiency; 4.2.4. One-Factor-at-a-Time Testing; 4.3. Selecting a Statistical Design; 4.3.1. Consideration of Objectives; 4.3.2. Factor Effects; 4.3.3. Precision and Efficiency; 4.3.4. Randomization; 4.4. Designing for Quality Improvement; Exercises

5. Factorial Experiments in Completely Randomized Designs5.1. Factorial Experiments; 5.2. Interactions; 5.3. Calculation of Factor Effects; 5.4. Graphical Assessment of Factor Effects; Appendix: Calculation of Effects for Factors with More than Two Levels; Exercises; 6. Analysis of Completely Randomized Designs; 6.1. Balanced Multifactor Experiments; 6.1.1. Fixed Factor Effects; 6.1.2. Analysis-of-Variance Models; 6.1.3. Analysis-of-Variance Tables; 6.2. Parameter Estimation; 6.2.1. Estimation of the Error Standard Deviation; 6.2.2. Estimation of Effects Parameters

6.2.3. Quantitative Factor Levels6.3. Statistical Tests; 6.3.1. Tests on Individual Parameters; 6.3.2. F-Tests for Factor Effects; 6.4. Multiple Comparisons; 6.4.1. Philosophy of Mean-Comparison Procedures; 6.4.2. General Comparisons of Means; 6.4.3. Comparisons Based on t-Statistics; 6.4.4. Tukey's Significant Difference Procedure; 6.5. Graphical Comparisons; Exercises; 7. Fractional Factorial Experiments; 7.1. Confounding of Factor Effects; 7.2. Design Resolution; 7.3. Two-Level Fractional Factorial Experiments; 7.3.1. Half Fractions; 7.3.2. Quarter and Smaller Fractions

7.4. Three-Level Fractional Factorial Experiments

Sommario/riassunto

Emphasizes the strategy of experimentation, data analysis, and the interpretation of experimental results.Features numerous examples using actual engineering and scientific studies.Presents statistics as an integral component of experimentation from the planning stage to the presentation of the conclusions.Deep and concentrated experimental design coverage, with equivalent but separate emphasis on the analysis of data from the various designs.Topics can be implemented by practitioners and do not require a high level of training in statistics. New edition includes new and