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Altri autori (Persone)	SaltelliA <1953-> (Andrea)
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Nota di contenuto	Global Sensitivity Analysis. The Primer; Contents; Preface; 1 Introduction to Sensitivity Analysis; 1.1 Models and Sensitivity Analysis; 1.1.1 Definition; 1.1.2 Models; 1.1.3 Models and Uncertainty; 1.1.4 How to Set Up Uncertainty and Sensitivity Analyses; 1.1.5 Implications for Model Quality; 1.2 Methods and Settings for Sensitivity Analysis - an Introduction; 1.2.1 Local versus Global; 1.2.2 A Test Model; 1.2.3 Scatterplots versus Derivatives; 1.2.4 Sigma-normalized Derivatives; 1.2.5 Monte Carlo and Linear Regression; 1.2.6 Conditional Variances - First Path 1.2.7 Conditional Variances - Second Path 1.2.8 Application to Model (1.3); 1.2.9 A First Setting: 'Factor Prioritization'; 1.2.10 Nonadditive Models; 1.2.11 Higher-order Sensitivity Indices; 1.2.12 Total Effects; 1.2.13 A Second Setting: 'Factor Fixing'; 1.2.14 Rationale for Sensitivity Analysis; 1.2.15 Treating Sets; 1.2.16 Further Methods; 1.2.17 Elementary Effect Test; 1.2.18 Monte Carlo Filtering; 1.3 Nonindependent Input Factors; 1.4 Possible Pitfalls for a Sensitivity Analysis; 1.5 Concluding Remarks; 1.6 Exercises; 1.7 Answers; 1.8 Additional Exercises

1.9 Solutions to Additional Exercises
2 Experimental Designs; 2.1 Introduction; 2.2 Dependency on a Single Parameter; 2.3 Sensitivity Analysis of a Single Parameter; 2.3.1 Random Values; 2.3.2 Stratified Sampling; 2.3.3 Mean and Variance Estimates for Stratified Sampling; 2.4 Sensitivity Analysis of Multiple Parameters; 2.4.1 Linear Models; 2.4.2 One-at-a-time (OAT) Sampling; 2.4.3 Limits on the Number of Influential Parameters; 2.4.4 Fractional Factorial Sampling; 2.4.5 Latin Hypercube Sampling; 2.4.6 Multivariate Stratified Sampling; 2.4.7 Quasi-random Sampling with Low-discrepancy Sequences
2.5 Group Sampling
2.6 Exercises; 2.7 Exercise Solutions; 3 Elementary Effects Method; 3.1 Introduction; 3.2 The Elementary Effects Method; 3.3 The Sampling Strategy and its Optimization; 3.4 The Computation of the Sensitivity Measures; 3.5 Working with Groups; 3.6 The EE Method Step by Step; 3.7 Conclusions; 3.8 Exercises; 3.9 Solutions; 4 Variance-based Methods; 4.1 Different Tests for Different Settings; 4.2 Why Variance?; 4.3 Variance-based Methods. A Brief History; 4.4 Interaction Effects; 4.5 Total Effects; 4.6 How to Compute the Sensitivity Indices; 4.7 FAST and Random Balance Designs
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4.9 Caveats; 4.10 Exercises; 5 Factor Mapping and Metamodelling; 5.1 Introduction; 5.2 Monte Carlo Filtering (MCF); 5.2.1 Implementation of Monte Carlo Filtering; 5.2.2 Pros and Cons; 5.2.3 Exercises; 5.2.4 Solutions; 5.2.5 Examples; 5.3 Metamodelling and the High-Dimensional Model Representation; 5.3.1 Estimating HDMRs and Metamodels; 5.3.2 A Simple Example; 5.3.3 Another Simple Example; 5.3.4 Exercises; 5.3.5 Solutions to Exercises; 5.4 Conclusions; 6 Sensitivity Analysis: From Theory to Practice
6.1 Example 1: A Composite Indicator

Sommario/riassunto

Complex mathematical and computational models are used in all areas of society and technology and yet model based science is increasingly contested or refuted, especially when models are applied to controversial themes in domains such as health, the environment or the economy. More stringent standards of proofs are demanded from model-based numbers, especially when these numbers represent potential financial losses, threats to human health or the state of the environment. Quantitative sensitivity analysis is generally agreed to be one such standard. Mathematical models are good at mapping as
