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Autore	Kurowicka Dorota <1967->
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Nota di contenuto	Uncertainty Analysis with High Dimensional Dependence Modelling; Contents; Preface; 1 Introduction; 1.1 Wags and Bogsats; 1.2 Uncertainty analysis and decision support: a recent example; 1.3 Outline of the book; 2 Assessing Uncertainty on Model Input; 2.1 Introduction; 2.2 Structured expert judgment in outline; 2.3 Assessing distributions of continuous univariate uncertain quantities; 2.4 Assessing dependencies; 2.5 Unicorn; 2.6 Unicorn projects; 3 Bivariate Dependence; 3.1 Introduction; 3.2 Measures of dependence; 3.2.1 Product moment correlation; 3.2.2 Rank correlation; 3.2.3 Kendall's tau 3.3 Partial, conditional and multiple correlations3.4 Copulae; 3.4.1 Fr chet copula; 3.4.2 Diagonal band copula; 3.4.3 Generalized diagonal band copula; 3.4.4 Elliptical copula; 3.4.5 Archimedean copulae; 3.4.6 Minimum information copula; 3.4.7 Comparison of copulae; 3.5 Bivariate normal distribution; 3.5.1 Basic properties; 3.6 Multivariate extensions; 3.6.1 Multivariate dependence measures; 3.6.2 Multivariate copulae; 3.6.3 Multivariate normal distribution; 3.7 Conclusions; 3.8 Unicorn projects; 3.9 Exercises; 3.10 Supplement; 4 High-dimensional Dependence Modelling; 4.1 Introduction 4.2 Joint normal transform4.3 Dependence trees; 4.3.1 Trees; 4.3.2

Dependence trees with copulae; 4.3.3 Example: Investment; 4.4 Dependence vines; 4.4.1 Vines; 4.4.2 Bivariate- and copula-vine specifications; 4.4.3 Example: Investment continued; 4.4.4 Partial correlation vines; 4.4.5 Normal vines; 4.4.6 Relationship between conditional rank and partial correlations on a regular vine; 4.5 Vines and positive definiteness; 4.5.1 Checking positive definiteness; 4.5.2 Repairing violations of positive definiteness; 4.5.3 The completion problem; 4.6 Conclusions; 4.7 Unicorn projects; 4.8 Exercises
4.9 Supplement
4.9.1 Proofs; 4.9.2 Results for Section 4.4.6; 4.9.3 Example of fourvariate correlation matrices; 4.9.4 Results for Section 4.5.2; 5 Other Graphical Models; 5.1 Introduction; 5.2 Bayesian belief nets; 5.2.1 Discrete bbn's; 5.2.2 Continuous bbn's; 5.3 Independence graphs; 5.4 Model inference; 5.4.1 Inference for bbn's; 5.4.2 Inference for independence graphs; 5.4.3 Inference for vines; 5.5 Conclusions; 5.6 Unicorn projects; 5.7 Supplement; 6 Sampling Methods; 6.1 Introduction; 6.2 (Pseudo-) random sampling; 6.3 Reduced variance sampling; 6.3.1 Quasi-random sampling
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6.3.3 Latin hypercube sampling; 6.4 Sampling trees, vines and continuous bbn's; 6.4.1 Sampling a tree; 6.4.2 Sampling a regular vine; 6.4.3 Density approach to sampling regular vine; 6.4.4 Sampling a continuous bbn; 6.5 Conclusions; 6.6 Unicorn projects; 6.7 Exercise; 7 Visualization; 7.1 Introduction; 7.2 A simple problem; 7.3 Tornado graphs; 7.4 Radar graphs; 7.5 Scatter plots, matrix and overlay scatter plots; 7.6 Cobweb plots; 7.7 Cobweb plots local sensitivity: dike ring reliability; 7.8 Radar plots for importance; internal dosimetry; 7.9 Conclusions
7.10 Unicorn projects

Sommario/riassunto

Mathematical models are used to simulate complex real-world phenomena in many areas of science and technology. Large complex models typically require inputs whose values are not known with certainty. Uncertainty analysis aims to quantify the overall uncertainty within a model, in order to support problem owners in model-based decision-making. In recent years there has been an explosion of interest in uncertainty analysis. Uncertainty and dependence elicitation, dependence modelling, model inference, efficient sampling, screening and sensitivity analysis, and probabilistic inversion are among t
