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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 Supplement4.9.1 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
6.3.2 Stratified sampling6.3.3 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