

1. Record Nr.	UNINA9910136520603321
Autore	Weber Philippe
Titolo	Benefits of Bayesian network models // Philippe Weber, Christophe Simon
Pubbl/distr/stampa	Hoboken, NJ : , : Wiley, , 2016
ISBN	1-119-34731-9 1-119-34744-0 1-119-34745-9
Descrizione fisica	1 online resource (151 p.)
Collana	Systems dependability assessment set ; ; volume 2
Disciplina	519.5/42
Soggetti	Uncertainty (Information theory) - Mathematical models Bayesian statistical decision theory Computer software - Development
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover ; Title Page ; Copyright ; Contents; Foreword by J.-F. Aubry; Foreword by L. Portinale; Acknowledgments; Introduction; I.1. Problem statement; I.2. Book structure; PART 1. Bayesian Networks; 1. Bayesian Networks: a Modeling Formalism for System Dependability; 1.1. Probabilistic graphical models: BN; 1.1.1. BN: a formalism to model dependability; 1.1.2. Inference mechanism; 1.2. Reliability and joint probability distributions; 1.2.1. Multi-state system example; 1.2.2. Joint distribution; 1.2.3. Reliability computing; 1.2.4. Factorization; 1.3. Discussion and conclusion 2. Bayesian Network: Modeling Formalism of the Structure Function of Boolean Systems2.1. Introduction; 2.2. BN models in the Boolean case; 2.2.1. BN model from cut-sets; 2.2.2. BN model from tie-sets; 2.2.3. BN model from a top-down approach; 2.2.4. BN model of a bowtie; 2.3. Standard Boolean gates CPT; 2.4. Non-deterministic CPT; 2.5. Industrial applications; 2.6. Conclusion; 3. Bayesian Network: Modeling Formalism of the Structure Function of Multi-State Systems; 3.1. Introduction; 3.2. BN models in the multi-state case; 3.2.1. BN model of multi-state systems from tie-sets 3.2.2. BN model of multi-state systems from cut-sets3.2.3. BN model

of multi-state systems from functional and dysfunctional analysis; 3.3. Non-deterministic CPT; 3.4. Industrial applications; 3.5. Conclusion; PART 2. Dynamic Bayesian Networks; 4. Dynamic Bayesian Networks: Integrating Environmental and Operating Constraints in Reliability Computation; 4.1. Introduction; 4.2. Component modeled by a DBN; 4.2.1. DBN model of a MC; 4.2.2. DBN model of non-homogeneous MC; 4.2.3. Stochastic process with exogenous constraint; 4.3. Model of a dynamic multi-state system  
4.4. Discussion on dependent processes  
4.5. Conclusion; 5. Dynamic Bayesian Networks: Integrating Reliability Computation in the Control System; 5.1. Introduction; 5.2. Integrating reliability information into the control; 5.3. Control integrating reliability modeled by DBN; 5.3.1. Modeling and controlling an over-actuated system; 5.3.2. Integrating reliability; 5.4. Application to a drinking water network; 5.4.1. DBN modeling; 5.4.2. Results and discussion; 5.5. Conclusion; 5.6. Acknowledgments; Conclusion; Modeling the functional consequences of failures from structured knowledge  
Dynamic modeling system reliability based on the reliability of components from the environment  
Synthesis of the control law with the aim of optimizing system reliability based on its sensitivity to actuator failures; Bibliography; Index; Other titles from iSTE in Systems and Industrial Engineering - Robotics; EULA

---

## Sommario/riassunto

This book explains the principles of knowledge structuration to ensure a valid BN and DBN model and illustrate the flexibility and efficiency of these representations in dependability, risk analysis and control of multi-state systems and dynamic systems. Across five chapters, the authors present several modeling methods and industrial applications are referenced for illustration in real industrial contexts.--

---