

Foreword

It gives me great pleasure to write the foreword for this book, which gives a simple and lucid understanding of Bayesian networks. Bayesian networks play a central role in the machine learning research and have been successfully applied to different fields due to their flexible nature. A Bayesian network is a high-level representation of a probability distribution over a set of variables that are used for building models of specific problem domains. It is represented by a graphical model where nodes represent the variables and arcs represent the statistical dependence among the variables. The flexibility of choosing the variables and of relationship among the variables based on domain specific nature and strong statistical support lead to high and reliable performance of Bayesian networks.

The book is divided into three major parts. The first part addresses the intricacies involved in modeling a Bayesian network. Modeling complex domains is an active area of research which can be applied to database queries, reliability analysis and classification. Researchers in machine learning will definitely find this part helpful for modeling and applying Bayesian networks to complex domains. The second and third parts of the book present the application of Bayesian networks to the highly mature but complex field of image processing and the newer data intensive field of Bioinformatics.

This book will be very useful for researchers from diverse fields, such as computer science, engineering, mathematics, physics, chemistry, and biology. The structure and applications of the book are quite appealing and I hope the readers will find the book an interesting work of knowledge enhancement tool.

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