

Probabilistic expert systems

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20451204&lokasi=lokal>

Abstrak

The field of probabilistic expert systems has continued to flourish since the author delivered his lectures on the topic in June 1992, but the understanding of join-tree architectures has remained missing from the literature. This monograph fills this void by providing an analysis of join-tree methods for the computation of prior and posterior probabilities in belief nets. These methods, pioneered in the mid to late 1980s, continue to be central to the theory and practice of probabilistic expert systems. In addition to purely probabilistic expert systems, join-tree methods are also used in expert systems based on Dempster-Shafer belief functions or on possibility measures. Variations are also used for computation in relational databases, in linear optimization, and in constraint satisfaction.

This book describes probabilistic expert systems in a more rigorous and focused way than existing literature, and provides an annotated bibliography that includes pointers to conferences and software. Also included are exercises that will help the reader begin to explore the problem of generalizing from probability to broader domains of recursive computation.