

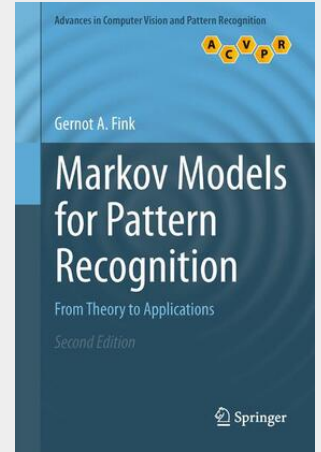
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Markov Models for Pattern Recognition

From Theory to Applications

This thoroughly revised and expanded new edition now includes a more detailed treatment of the EM algorithm, a description of an efficient approximate Viterbi-training procedure, a theoretical derivation of the perplexity measure and coverage of multi-pass decoding based on n-best search. Supporting the discussion of the theoretical foundations of Markov modeling, special emphasis is also placed on practical algorithmic solutions. Features: introduces the formal framework for Markov models; covers the robust handling of probability quantities; presents methods for the configuration of hidden Markov models for specific application areas; describes important methods for efficient processing of Markov models, and the adaptation of the models to different tasks; examines algorithms for searching within the complex solution spaces that result from the joint application of Markov chain and hidden Markov models; reviews key applications of Markov models.

Markov models are extremely useful as a general, widely applicable tool for many areas in statistical pattern recognition. This unique text/reference places the formalism of Markov chain and hidden Markov models at the very center of its examination of current pattern recognition systems, demonstrating how the models can be used in a range of different applications. Thoroughly revised and expanded, this new edition now includes a more detailed treatment of the EM algorithm, a description of an efficient approximate Viterbi-training procedure, a theoretical derivation of the perplexity measure, and coverage of multi-pass decoding based on n-best search. Supporting the discussion of the theoretical foundations of Markov modeling, special emphasis is also placed on practical algorithmic solutions. Topics and features: introduces the formal framework for Markov models, describing hidden Markov models and Markov chain models, also known as n-gram models; covers the robust handling of probability quantities, which are omnipresent when dealing with these statistical methods; presents methods for the configuration of hidden Markov models for specific application areas, explaining the estimation of the model parameters; describes important methods for efficient processing of Markov models, and the adaptation of the models to different tasks; examines algorithms for searching within the complex solution spaces that result from the joint application of Markov chain and hidden Markov models; reviews key applications of Markov models in automatic speech recognition, character and handwriting recognition, and the analysis of biological sequences. Researchers, practitioners, and graduate students of pattern recognition will all find this book to be invaluable in aiding their understanding of the application of statistical methods in this area.



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