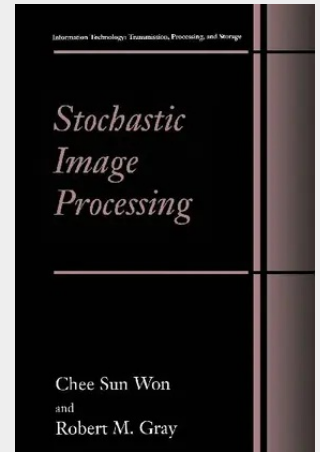


Stochastic Image Processing

Stochastic Image Processing provides the first thorough treatment of Markov and hidden Markov random fields and their application to image processing. Although promoted as a promising approach for over thirty years, it has only been in the past few years that the theory and algorithms have developed to the point of providing useful solutions to old and new problems in image processing. Markov random fields are a multidimensional extension of Markov chains, but the generalization is complicated by the lack of a natural ordering of pixels in multidimensional spaces. Hidden Markov fields are a natural generalization of the hidden Markov models that have proved essential to the development of modern speech recognition, but again the multidimensional nature of the signals makes them inherently more complicated to handle. This added complexity contributed to the long time required for the development of successful methods and applications. This book collects together a variety of successful approaches to a complete and useful characterization of multidimensional Markov and hidden Markov models along with applications to image analysis. The book provides a survey and comparative development of an exciting and rapidly evolving field of multidimensional Markov and hidden Markov random fields with extensive references to the literature.

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