
This book provides an extensive treatment of the problems of pattern recognition by use of syntactic methods. The author intends the book to be used as a reference by system engineers and computer scientists, and it would also serve as a supplementary textbook for courses in pattern recognition. The book provides one of the most extensive surveys of the relevant literature known to the reviewer.

I give here a brief summary of the contents. Chapter 1 is an introduction to the syntactic approach to pattern recognition. A comparison is made here between the syntactic approach and the statistical decision-theoretic approach. Chapter 2 is an introduction to formal languages, with a concentration on standard concepts of finite state, context-free, and context-sensitive languages. Chapter 3 is concerned with languages for pattern description. This chapter contains a detailed discussion of the selection of pattern primitives. Chapter 4 deals with syntax analysis as a recognition procedure. Consideration is given to such topics as top-down versus bottom-up parsing. Chapter 5 is concerned with stochastic languages and stochastic syntax analysis. The basic facts about probabilistic grammars or languages are surveyed. Chapter 6 is concerned with the more special topic of stochastic languages for syntactic pattern recognition and may be regarded as a specialization of Chapter 5. Finally, the last chapter, Chapter 7, is concerned with grammatical inference for syntactic pattern recognition. There are, in addition, a large number of appendices on special topics, such as syntactic recognition of chromosome patterns and syntactic recognition of Chinese characters.

The book has many excellent features and it can be recommended because of its encyclopedic survey of the present state of the literature. On the other hand, a weakness of the book is the lack of sharp evaluations of the strengths and weaknesses of various approaches. The book reads somewhat too much like a compilation of the literature rather than a presentation of a unified theoretical viewpoint toward pattern recognition. Perhaps it is premature to expect such a unified approach, but it is appropriate to ask for more evaluative comments on the various syntactic approaches to pattern recognition and hopefully such will be added in future editions.

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