

PATTERN THEORY C

Pattern Theory provides a comprehensive and accessible overview of the modern challenges in signal, data, and pattern analysis in speech recognition, computational linguistics, image analysis and computer vision. Aimed at graduate students in biomedical engineering, mathematics, computer science, and electrical engineering with a good background in mathematics and probability, the text includes numerous exercises and an extensive bibliography. Additional resources including extended proofs, selected solutions and examples are available on a companion website.

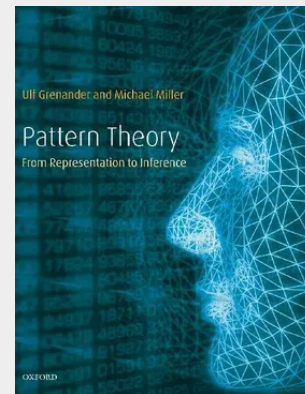
The book commences with a short overview of pattern theory and the basics of statistics and estimation theory. Chapters 3-6 discuss the role of representation of patterns via condition structure. Chapters 7 and 8 examine the second central component of pattern theory: groups of geometric transformation applied to the representation of geometric objects. Chapter 9 moves into probabilistic structures in the continuum, studying random processes and random fields indexed over subsets of $\mathbb{R}^n$. Chapters 10 and 11 continue with transformations and patterns indexed over the continuum.

Chapters 12-14 extend from the pure representations of shapes to the Bayes estimation of shapes and their parametric representation. Chapters 15 and 16 study the estimation of infinite dimensional shape in the newly emergent field of Computational Anatomy. Finally, Chapters 17 and 18 look at inference, exploring random sampling approaches for estimation of model order and parametric representing of shapes.

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