

# Preface

Modern intelligent classification systems are characterized with an insufficient performance in the case of large databases. Various search techniques have been proposed to speedup the search procedures for such tasks as image analysis, speech recognition, etc. However, the features, the classifiers, and the structural scheme of decision-making are individually designed for each specific domain.

The purpose of this monograph is to describe the unified methodology for the classification of audiovisual data. By using probability theory, we present novel asymptotically minimax criteria, suitable for practical applications in imaging and data analysis. We highlight several well-known special cases, e.g., the probabilistic neural network and the nearest neighbor rule with the Jensen-Shannon divergence.

Our goal is to provide a guide for students and young researchers, who are interested in both theoretical and practical aspects of the classifier design in intelligent systems, which suffer from the small-sample size problem. We assume only minimal familiarity of the reader with a course in probability theory. This monograph can be used not only as a guide for independent study but also as a supplementary material for a technically oriented graduate course in intelligent systems and data mining.

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