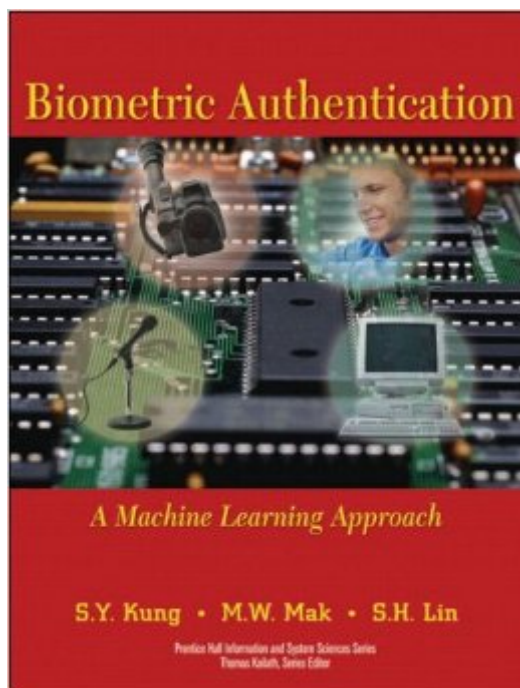


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# Biometric Authentication: A Machine Learning Approach



## Synopsis

A breakthrough approach to improving biometrics performance  
Constructing robust information processing systems for face and voice recognition  
Supporting high-performance data fusion in multimodal systems  
Algorithms, implementation techniques, and application examples  
Machine learning: driving significant improvements in biometric performance  
As they improve, biometric authentication systems are becoming increasingly indispensable for protecting life and property. This book introduces powerful machine learning techniques that significantly improve biometric performance in a broad spectrum of application domains. Three leading researchers bridge the gap between research, design, and deployment, introducing key algorithms as well as practical implementation techniques. They demonstrate how to construct robust information processing systems for biometric authentication in both face and voice recognition systems, and to support data fusion in multimodal systems. Coverage includes: How machine learning approaches differ from conventional template matching  
Theoretical pillars of machine learning for complex pattern recognition and classification  
Expectation-maximization (EM) algorithms and support vector machines (SVM)  
Multi-layer learning models and back-propagation (BP) algorithms  
Probabilistic decision-based neural networks (PDNNs) for face biometrics  
Flexible structural frameworks for incorporating machine learning subsystems in biometric applications  
Hierarchical mixture of experts and inter-class learning strategies based on class-based modular networks  
Multi-cue data fusion techniques that integrate face and voice recognition  
Application case studies

## Book Information

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## Customer Reviews

Any time you can pick up a used copy of a recently published technical book on an interesting topic at one-fourth of the retail price, you know there must be a problem. You would be right. This book tries to do three things at the same time and fails with at least two of its goals. It tries to talk about the business issues of biometrics, technical issues of specific biometric technologies (face recognition, speech recognition, etc.), and finally machine learning techniques used to accomplish the biometric measurements. Only at this last goal do I think the book comes close to success, and even then only on a sketchy high level. The first seven chapters do an OK job of explaining machine learning techniques and give you some very instructive figures that are often lacking in academic textbooks, especially on neural networks. Also, these chapters do a pretty good job of explaining the equations involved. What's lacking, though, even in these early chapters, are some simple numerical examples or algorithmic steps that would give you some guidance on how to approach a task. When the book tries to make the leap to connecting the machine learning techniques to biometric authentication in a meaningful way such that a computer scientist could code up an algorithm, the book really falls on its face. There are some nice block diagrams of biometric systems, but no real details on algorithmic steps that would allow you to realize any of those blocks. Instead, there is quite a bit of verbiage on the competition involved on building particular kinds of systems, and some rhetoric on possible pitfalls in specific biometric designs. However, with you standing there not knowing where to start with your design, this advice is really not very helpful.

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