Resource-allocating codebook for patch-based face recognition

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Abstract

In this paper we propose a novel approach to constructing a discriminant visual codebook in a simple and extremely fast way as a one-pass, that we call Resource-Allocating Codebook (RAC), inspired by the Resource Allocating Network (RAN) algorithms developed in the artificial neural networks literature. Unlike density preserving clustering, this approach retains data spread out more widely in the input space, thereby including rare low level features in the codebook. We show that the codebook constructed by the RAC technique outperforms the codebook constructed by K-means clustering in recognition performance and computation on two standard face databases, namely the AT&T and Yale faces, performed with SIFT features.

Author keywords

Cluster analysis; Codebook; Face recognition; SIFT

Indexed keywords

Artificial Neural Network; Codebook; Codebooks; Face database; Input space; K-means clustering; Low-level features; One-pass; Recognition performance; Resource allocating networks; SIFT Feature.

Engineering controlled terms: Cluster analysis; Information systems; Neural networks.

Engineering main heading: Face recognition.