

Compact Codebook Design for Visual Scene Recognition by Sequential Input Space Carving

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Abstract

We present a novel approach to the design of codebooks in patch-based, bag-of-feature visual scene recognition problems. The Sequential Input Space Carving (SISC) approach we present achieves compact codebooks in a fraction of the computation time needed by the K-means clustering method usually employed in this setting. We demonstrate the performance of the SISC using several recognition tasks including the PASCAL VOC challenge, human action classification tasks using the KTH and WEIZMANN datasets and texture classification tasks using the UIUC, and CURET datasets. In all these, the SISC approach achieves classification performances comparable to those reported by other authors, and sometimes outperforms them, in a fraction of the computing time and at significantly smaller codebook sizes.

Author Keywords

Visual codebook, Sequential Input Space Carving, K-means, Mean-shift, Resource Allocating Codebook