

Effective and Efficient Global Context Verification for Image Copy Detection

ABSTRACT:

To detect illegal copies of copyrighted images, recent copy detection methods mostly rely on the bag-of-visual-words (BOW) model, in which local features are quantized into visual words for image matching. However, both the limited discriminability of local features and the BOW quantization errors will lead to many false local matches, which make it hard to distinguish similar images from copies. Geometric consistency verification is a popular technology for reducing the false matches, but it neglects global context information of local features and thus cannot solve this problem well. To address this problem, this paper proposes a global context verification scheme to filter false matches for copy detection. More specifically, after obtaining initial scale invariant feature transform (SIFT) matches between images based on the BOW quantization, the overlapping region-based global context descriptor (OR-GCD) is proposed for verification of these matches to filter false matches. The OR-GCD not only encodes relatively rich global context information of SIFT features but also has good robustness and efficiency. Thus it allows an effective and efficient verification.

INTRODUCTION

WITH the rapid development of network technologies and the wide use of various powerful multimedia processing tools, digital multimedia (image, video and audio) is becoming easier to be replicated, modified and distributed on networks . To protect owners against unauthorized (re)use of their content, detecting illegal copies of digital multimedia is a basic requirement . In recent years, content-based image copy detection has been researched as a passive technology to detect illegal copies. Different from watermarking, which uses previously embedded marks, this

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technology extracts content-based features from images and then searches for the copies by matching the extracted features. The main advantages of content-based image copy detection are that it does not need additional information and copy detection can be implemented after image distribution . In addition, content-based copy detection technology can be applied to some emerging applications, such as automatic annotating , redundancy elimination , and merchandize image retrieval.

TECHNOFIST