

Perceptually Based Methods for Robust Image Hashing

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Abstract

A perceptual image hash function maps an image to a short binary string based on an image's appearance to the human eye. Perceptual hashing is useful in image databases, watermarking, and content authentication in adversarial scenarios.

In this talk, I decouple image hashing into feature extraction (intermediate hash) followed by data clustering (final hash). I present first, an iterative geometry preserving feature extraction algorithm. At the heart of the proposed feature extraction, lies an explicit modeling of the human visual system via end-stopped wavelets.

For the second stage, I show that the decision version of the feature clustering problem is NP-complete. Then, for any perceptually significant feature extractor, I develop polynomial time clustering algorithms based on a greedy heuristic. Finally, I present randomized clustering algorithms for secure image hashing
