

Color Image Representations: From Pixels to Robust Perceptual Hash Codes

Speaker:

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Abstract:

Compact representations of color image and video content allow efficient search, retrieval and storage of this content over the Internet and online repositories. However, most of these representations neither take into account the inherent correlation nor the perceptual redundancy of the color information. In this talk, a novel perceptual hash representation for color images using robust image features is introduced. These features, most dominant singular vectors extracted using the quaternion singular value decomposition (QSVD) of pseudorandomly selected overlapping image blocks, are efficiently used for color image search and retrieval applications. The QSVD algorithm leads to proper modeling of possible geometric attacks as an independent and identically-distributed (i.i.d) quaternionic random noise on the singular vectors.

The hashing robustness against geometric attacks is evaluated over a large set of test color images using the receiver operating characteristics (ROC) analysis. The proposed scheme outperforms many existing ones in terms of lower miss and false alarm probabilities without incurring substantial increase in computational complexity.

Bio:

Lahouari Ghouti is currently an Associate Professor of Computer Science at King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia. His research interests include machine learning, biometric systems and forensic digital imaging. Ghouti has published many papers in refereed journal and conference related to his research interests in addition to published and pending US patents.