

Similarity-preserving hashing is a commonly used method for nearest neighbor search in large-scale image retrieval. For image retrieval, deep-network-based hashing methods are appealing, since they can simultaneously learn effective image representations and compact hash codes. This paper focuses on deep-network-based hashing for multi-label images, each of which may contain objects of multiple categories. In most existing hashing methods, each image is represented by one piece of hash code, which is referred to as semantic hashing. This setting may be suboptimal for multi-label image retrieval. To solve this problem, we propose a deep architecture that learns instance-aware image representations for multi-label image data, which are organized in multiple groups, with each group containing the features for one category. The instance-aware representations not only bring advantages to semantic hashing but also can be used in category-aware hashing, in which an image is represented by multiple pieces of hash codes and each piece of code corresponds to a category. Extensive evaluations conducted on several benchmark data sets demonstrate that for both the semantic hashing and the category-aware hashing, the proposed method shows substantial improvement over the state-of-the-art supervised and unsupervised hashing methods.